

FOREIGN INDUSTRIAL TARGETING AND ITS EFFECTS ON U.S. INDUSTRIES PHASE III: BRAZIL, CANADA, THE REPUBLIC OF KOREA, MEXICO, AND TAIWAN

**Report to the Subcommittee on
Trade, Committee on Ways and
Means, U.S. House of
Representatives, on
Investigation No. 332-162
Under Section 332(b) of
the Tariff Act of 1930**

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PREFACE

On April 19, 1983, the United States International Trade Commission instituted investigation No. 332-162 to obtain information on foreign industrial targeting. The investigation was instituted by the Commission on its own motion at the request of the Subcommittee on Trade of the House Committee on Ways and Means, under section 332(b) of the Tariff Act of 1930 (19 U.S.C. 332(b)) to advise the Subcommittee on the implications of these practices for U.S. industries. The Commission received the request on March 25, 1983. On October 7, 1983, the Commission gave the Subcommittee its report on the first phase of the investigation. That report contained a general introduction to the issue of targeting, a discussion of the relationship between U.S. trade laws and targeting, and a thorough discussion of industrial targeting in Japan. ("Foreign Industrial Targeting and Its Effects on U.S. Industries Phase I: Japan," USITC Publication 1437). On April 23, 1984, the Commission gave the Subcommittee its report on the second phase of the investigation ("Foreign Industrial Targeting and Its Effects on U.S. Industries Phase II: The European Community and Member States," USITC Publication 1517).

The Commission subsequently began the third phase of this investigation, which involves targeting by Brazil, Canada, Korea, Mexico, and Taiwan. Public notice of the investigation was given by posting a copy of the notice in the Office of the Secretary, U.S. International Trade Commission, Washington, D.C., and by publishing the notice in the Federal Register of June 6, 1984 (Volume 49, No. 110, p. 23463). 1/

The information contained in this report is from the Commission's files, other Government agencies, fieldwork, briefs filed by interested parties and other sources.

1/ A copy of the Commission's notice of investigation and hearing is presented in app. A.

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Introduction

This report covers the third, and final, phase of the Commission's investigation of industrial targeting. In this phase, the Commission is examining the policies of Brazil, Canada, the Republic of Korea (Korea), Mexico, and Taiwan to determine which policies target selected industries. A report on the first phase, Japanese industrial targeting, was released in October 1983, and a report on the second phase, the European Community (EC) and certain member state industrial targeting, was released in April 1984. ^{1/}

Industrial targeting is defined as coordinated government actions that direct productive resources to give domestic producers in selected non-agricultural industries a competitive advantage. There are four elements to this definition: (1) there are coordinated government actions; (2) productive resources are directed; (3) only selected industries are targeted; and, (4) domestic producers in these industries are provided with a competitive advantage. Targeting techniques include the selective use of home-market protection, tax policies, financial assistance, science and technology assistance, and exemptions to laws governing cartels and mergers. Different techniques can have very different effects. For example, whereas financial assistance may quickly increase an industry's output, science and technology assistance may not increase output for years, and antitrust exemptions may reduce an industry's output by enabling it to increase its prices above the competitive level.

This report begins with a discussion of the definition of targeting and of targeting's effects on U.S. industries. The report explains that although targeting can seriously harm the competitiveness of a U.S. industry or group of industries, it is unlikely to significantly affect the U.S. long-run current account balance.

The report then discusses the targeting-related policies of Brazil, Canada, Korea, Mexico, and Taiwan. Each of these country sections discusses the historical development of the country's industrial policy and then discusses five major areas of industrial policy corresponding to the targeting techniques listed above: home-market protection, tax policy, financial assistance, science and technology, and cartel and merger policy. The report also reviews targeting techniques of the countries as the techniques relate to specific industries, and it presents data profiles for those industries.

^{1/} Foreign Industrial Targeting and Its Effects on U.S. Industries Phase I: Japan: Report to the Subcommittee on Trade, Committee on Ways and Means, U.S. House of Representatives on Investigation No. 332-162 . . . , USITC Publication 1437, October 1983. Foreign Industrial Targeting and its Effects on U.S. Industries Phase II: The European Community . . . , USITC Publication 1517, April 1984.

SUMMARY

Assessment of the Effects of Targeting

Brazil

Many Brazilians in Government and business believe that without targeting Brazil's economy would be predominately agricultural. The evidence is persuasive that industrial targeting has caused some local industries to grow and to become exporters.

The principal means of encouraging the massive structural change from agriculture to industry which occurred in Brazil in the 1950's and 1960's was import substitution. For example, the automobile, textile, footwear, computer semi-conductor and steel industries grew up behind walls of protection against imports. In the process, these industries have benefitted from extensive packages of Government aid in the form of subsidized financing, tax benefits, Government procurement practices, and R&D financing.

Gradually, industries that had become established domestically were encouraged to export. Fiscal incentives--direct subsidies and other forms of encouragement--were given to exporters to boost their exports. Partly as a result of targeting in specific sectors, manufactures went from 40 percent of exports in 1972 to 60 percent in 1983. This shift in the composition of exports was roughly parallel to the earlier shift in the sectoral share of GDP contributed by industry. Between 1946 and 1962, industry's share of GDP surpassed that of agriculture.

In addition to encouraging the growth and exports of certain domestic industries, the Government of Brazil has also used targeting in some sectors to promote the Brazilian ownership of certain industries. The most notable of these has been the policy of reserving certain segments of the computer industry to Brazilian-owned firms. Using Government procurement as a means, the Government of Brazil has also encouraged national ownership of the telecommunications industry.

Canada

Most Canadian industrial programs provide Government assistance to a broad spectrum of industries. However Government programs to aid specific industries are few. More generally, the Canadian Government usually has taken a more active role in industrial questions than the United States Government; but Canada tends to be far less interventionist than the other countries covered in this report.

Various Government programs encourage the growth of exporting firms and of small businesses. On the Federal level, these programs provide assistance to a broad range of industries in manufacturing, mining, construction and agriculture. On the Provincial level, programs geared to specific industries are more common. Nevertheless, the level of assistance by both Federal and Provincial Governments is not large.

The targeting that takes place is more prevalent in declining industries. For example, Canada has a program designed to revitalize the textiles, clothing, and footwear industries. This revitalization program is supposed to last only from 1981 to 1986, and its overall budget is less than \$350 million. The program is supported by Canadian home-market protection of textiles and footwear.

A source of potential targeting is the large number of publicly owned enterprises and the regulation of foreign investment. Not only does the Canadian Government own a number of public utilities, but it also owns other companies in aerospace, petroleum and natural gas, steel, pulp and paper.

Although efforts to monitor and control the flow of capital in Canada have been considerable in the past, industry-specific criteria have not been a factor in the review process and this process has recently been liberalized.

Korea

Most Koreans probably support the view that their targeting efforts have generally reinforced the country's competitive advantage in output that is relatively labor intensive. Korea possesses a skilled, disciplined, and low-wage labor force.

Policies of import substitution were used to help to develop selected Korean domestic industries until the early 1960s. Import substitution policies such as stringent import controls and high tariffs promoted the cement, oil refining, and electricity production industries and then later were applied to basic petrochemicals, iron and steel, and transport equipment industries.

In the mid-1960s, export promotion became the basic industrial strategy when the Government decided that import substitution alone could no longer provide the desired level of support for selected industries. The Government began aggressively to encourage exports through financial, tax, and other incentives. By the early 1970s, the Government began targeting designated "strategic" industries for development. The National Investment Fund was created specifically to provide financing to promote these industries as well as to help increase exports. Industries designated as strategic include automobiles, electronics, shipbuilding, and steel. These industries receive priority access to Korea's credit facilities and other export incentives, although most interest rate differentials between preferential loans and general loans have been eliminated since 1982. Some other industries, such as machinery and textiles, further benefited from the establishment of special funds for preferential loans. Tax incentives and other financial inducements are also used to encourage development in those areas emphasized by the Government, such as skilled manpower development, and technological innovation.

The Korean Government provides considerable guidance for the development of its industrial sector through the implementation of 5-year economic plans. It also uses import restrictions and high tariffs to protect some of its domestic industries. For example, the automobile and electronics industries singled out for rapid development in the 1982-1986 plan will receive financial

and other incentives. Moreover, until recently the Government's control of the banking sector permitted interest rate differentials and credit allocations to be used as incentives to encourage export promotion.

Mexico

Since the 1940's, the Mexican Government has been committed to the policy of import substitution to promote industrial development. The Government believed that import substitution, rather than export promotion, would lead to economic growth, as domestic producers expanded to serve the large internal market under protection from import competition. At first, the Government promoted industry generally and indirectly by investing heavily in infrastructure and by gradually raising tariffs. In the 1960's, the Government began to practice direct intervention in the economy, using import licensing and incentives more systematically. In 1962, the first industry-specific decree applied both stringent requirements and incentives to the automotive industry. Import licensing became the mainstay of import-substitution efforts after the 1970's, and in 1979 the Government formally designated specific industries to receive priority in the granting of incentives.

In the postwar period, Mexico's economy experienced high growth rates, particularly in the manufacturing sector. Though this growth coincided with the Government's emphasis on import substitution, the role of industrial policy in promoting the growth is not clear. Infrastructure as well as the petroleum and iron and steel industries were developed directly by the Government.

Today, the Mexican Government intervenes heavily in many aspects of economic activity to achieve industrial goals. This intervention, often undertaken to target specific industries, also incurs disincentives that reduce, rather than enhance, the competitiveness of targeted industries. Government regulations include import restrictions, price controls, detailed decrees applied to specific industries, Government-ownership, public control over the banking system and import licensing. Other measures such as high tariffs, Government procurement policy and local content requirements encourage the purchase of Mexican products.

Expansion of industrial production is, however, only one of several competing objectives of government regulations and has been impeded by intervention to achieve social and political goals. One prominent goal is to increase Mexican ownership of industry. Other goals include promoting small and medium enterprise and balancing uneven regional development. In one example of targeting a specific industry, the pharmaceutical decree addresses the social goal of keeping on essential medicines affordable as well as the goal of increasing domestic production of medicines.

Government regulation has acted as a disincentive to Mexican manufacturers in a number of ways. For example, low prices set on basic commodities have contributed to lower profitability in industries selling these goods and greater inefficiency in industries employing these as inputs. Patent laws, designed to provide Mexican firms with easier access to foreign

technology, are another example. Limited patent protection has concerned foreign investors and also inhibited innovation by Mexican firms. Growth in manufacturing, particularly of final products and consumer goods, generally occurred in spite of the burdensome import licensing system and the need to import large amounts inputs subject to high, protective duties.

In the 1980's, the shortcomings of depending on import restrictions and import substitution to promote growth have been recognized. Debt repayment difficulties have lead the Government to encourage industries with high import bills to earn the foreign exchange they need by increasing exports. The de la Madrid Administration has begun to move toward the use of free-market mechanisms to force producers to increase quality and efficiency so that their products can be internationally competitive. The administration has begun to limit bureaucratic burdens and reorganize the tariff and import system. At the same time, however, new industry-specific regulatory decrees have been issued for the pharmaceuticals and computer industries, and more are expected. The Mexican Government would like to engage in industrial targeting much more effectively than it does at present. The Government has now adopted a long term goal of increasing export earnings. Targeting to "pick winners" could become more important as this policy takes shape.

Taiwan

Taiwan's economic performance over the past three decades has been impressive. High and consistent growth was achieved while maintaining full employment, stable prices, and even income distribution. Throughout the period, the Government tried to increase the competitiveness of particular industries by applying policy tools such as Government ownership and incentives to firms in the private sector. Perhaps because of these efforts, Taiwan's computer, electronic, machinery, and chemical industries have reached a fairly high level of sophistication relative to their developing country rivals.

The Government has been most actively involved in basic industries, such as shipbuilding, steelmaking, and petrochemicals. Because the Government considered these products to be crucial feedstocks for other important industries, it set up state-run enterprises to ensure that they were produced efficiently and allocated in the public interest. In 1982, the state-run firms accounted for one-fifth (19 percent) of industrial output in Taiwan and in 1983, 7 out of the largest 10 companies in Taiwan were Government-owned.

In other industries, the Government has played a supportive role. For example, the Government has sought to complement existing comparative advantages in the production of textiles, electronics, and machinery by supplying selective tax incentives, a sheltered domestic market, below-market funding for capital investments, and by sponsoring research and development efforts.

Government aid is dwarfed by other factors, however, in explaining the development of some of Taiwan's most successful industries. For example, foreign direct investment was the major spur to development of Taiwan's electronics industry. The electronics industry accounted for more than

one-fifth of Taiwan's industrial output in 1982 and foreign firms had supplied more than half of the total direct investment in that industry. Foreign firms also play a significant role in the textiles, chemicals, and machinery industries in Taiwan. This substantial flow of foreign investment capital came for many reasons, including labor cost and location, and the relative openness of Taiwan to foreign direct investment, compared with the very limited access foreign investors had in its neighboring countries, including Korea and Japan. These investments do not appear to have been based on assurances of special incentives by the authorities. The Government has attempted to shape foreign investments by encouraging local sourcing of components and requiring specified technology transfer to Taiwan nationals.

Despite industrial policy's possible achievements, many of Taiwan's important economic goals have not yet been reached: Taiwan's industrial structure is still fragmented, its value-added ratio in manufacturing is relatively low, and standards of quality and performance have not reached adequate levels in some cases. Furthermore, supply shortages of both materials and labor are putting upward pressure on prices. The Government may need to loosen existing economic controls if the economy is to reach its goals. The Government of Taiwan appears to be doing just that, taking steps in the past few years to reduce administrative burdens, to allow greater financial freedom, to open its markets more to imports, and to cut back on overly ambitious capacity-building efforts by Government-run enterprises. Foreign firms are likely to benefit from this shift, both by being called on to take a more active role in the development of industries such as cars and computers, and by being able to compete more freely in Taiwan's markets in the years ahead.

Principal Findings of the Research

Brazil

- o The Brazilian Government has used a variety of techniques to target its favored industries. The principal industries targeted are aerospace, automobiles, computers, heavy electrical equipment, footwear, pharmaceuticals, semiconductors, steel, telecommunications, textile and apparel. The main objectives of targeting have been to develop domestic industries to substitute for imports and to expand exports. Another major goal of the Brazilian Government is to promote local ownership in certain industries.

Targeting techniques include controlling imports and exports, screening foreign investment, directing loans made by the large state-owned part of the banking network, and applying discriminatory tax policies. The particular mechanisms used have varied depending upon the industries concerned, the resources available to the Government, and the targeting objective.

- o The Brazilian Government has the means to restrict imports, both selectively and across a wide range of products, without being constrained by international or regional agreements.

The Brazilian Government uses tariffs, import surcharges, import licensing and other restrictive mechanisms to cut back on imports when needed. Selective import controls have been used to shelter targeted industries at one time or another from the effects of international competition. In a more general application of its import controls, the Brazilian Government reduced imports from \$23.0 billion in 1980 to \$15.4 billion in 1983. This has eliminated all but the most essential imports of fuel, raw materials, and capital equipment.

- o Through state-owned industries, Government procurement is frequently used to promote domestic sourcing and domestic ownership in targeted industries.

With a 1984 budget of about \$60 billion for the state-owned industries, the Brazilian Government has been able to substitute domestic supplies for imports in several key industries. These procurement policies have been especially important in the growth of the domestic heavy electrical equipment and telecommunications industries. In the latter, government procurement policy has also helped increase Brazilian ownership.

- o The principal export targeting program is the Commission for the Granting of Fiscal Benefits for Special Export Programs (BEFIEX) under which a company makes a contractual commitment to export an agreed amount in exchange for an incentive package.

Throughout BEFIEX's 14-year history, the automobile industry has been the main recipient of BEFIEX support. Between 1981 and 1983, the industry accounted for approximately one-third of all BEFIEX export commitments.

- o Until recently a major export incentive has been the Credito Premio. This is scheduled to be phased out in 1985.

The Credito Premio is a cash grant equivalent to a share of the value of exports. The Credito Premio is being phased out in conformity with Brazil's commitment under the Agreement on Subsidies and Countervailing Duties.

- o The Brazilian Government is generally open to foreign direct investment in industry. However certain sectors are closed and others are closely regulated.

Because of Brazil's relatively receptive attitude to foreign investment, many sectors of the economy are dominated by foreign companies. Nonetheless, in some key areas such as in parts of the computer industry, foreign investment is prohibited.

- o In addition to promoting broad industrial policy objectives, tax incentives are used to promote specific industries.

An example is the tax law which permits companies to invest 1 percent of their main tax liability in Embraer, the Government-controlled airplane manufacturer, in lieu of paying the taxes.

- o Through its system of development banks and especially the principal development bank (BNDES), Brazil has targeted certain industries by providing long-term financing at subsidized rates.

In 1983 BNDES provided \$3.6 billion in loans. The steel industry, receiving approximately 20 percent of this money, has especially benefited from subsidized funding.

- o Government support for export financing provides both working capital and purchase funding for the major export industries. In most cases this funding is provided at below-market interest rates.

For example, the textile and apparel and the footwear industries have benefited from working capital funding provided by the Government for export industries. Government support has significantly aided manufacturers in these industries in raising working capital.

- o The Brazilian Government has long pursued policies aimed at advancing domestic science and technology. These policies have been pursued through direct government funding, strict controls on technology transfers, and programs to aid firms in their technological development.

Most funding is provided for training scientists and engineers and is oriented toward industrial innovation in general. However, some Government spending has helped develop capabilities in specific industries. The main sectors to receive funding are energy, agriculture, basic science, and environmental and natural resources.

- o Brazil has had antitrust legislation since 1962, but it has only rarely been used. Price controls have been used frequently.

Price controls were used from 1967 to 1980 and were reimposed again in 1983. It is alleged that the industries most subject to price controls are those with substantial forward linkages such as energy, coal, and steel. The foreign-dominated pharmaceuticals industry has also be the object of strict price controls.

Canada

- o In the 1950's and 1960's the Canadian Government used industrial strategy to target certain industries. Among the industries to receive preferential treatment were automobiles, aerospace, telecommunications, and energy. Official programs continue to support R&D in the aerospace industry, and a National Energy Program directs government policy relating to petroleum and natural gas. However, currently most Canadian industrial programs provide Government assistance to a broad spectrum of industries for such general purposes as encouraging the growth of exporting firms and promoting small businesses.

A free trade area in automotive trade between the United States and Canada was created in the sixties to bolster an industry viewed as pivotal to Canada. A more recent interventionist response has been the energy program which is aimed at increasing Canadian ownership of the oil and gas industry. Despite occasional initiatives in the industrial policy area, Canada has not articulated a comprehensive approach to industrial problems with an explicit set of policy instruments and coherent objectives.

- o Canadian industry benefits from a number of official programs of government assistance and support. Most of these programs, however, are not industry specific.

Canadian incentive programs usually provide benefits to broad groupings of industries and are not specifically targeted. For example, financial incentives (subsidized loans, loan guarantees, and grants) are geared principally to small- and medium-sized businesses. Other aid goes to industries in depressed regions and to industries more heavily involved with research and development (R&D).

- o Industrial targeting in Canada is oriented toward declining industries. Such industries are encouraged to adjust through adopting new technology or mergers.

The targeting that does take place is geared to those industries that have experienced economic difficulties and problems in adjusting, rather than to those that are growing and innovative. Examples of such targeting are the policies of the Canadian Industrial Renewal Board, which are specifically addressed to the needs of the textile, clothing, and footwear industries.

- o The Canadian Government actively supports research and development, but the dollar amount of this support, relative to that of other industrial countries, is small.

The proportion of the Canadian economy (both public and private) devoted to R&D has historically been lower than that of other major industrialized countries. In 1981 national research and development expenditures were 1.22 percent of gross domestic product in Canada; comparable figures for the United States, Switzerland, Germany, Japan, Sweden, and the Netherlands ranged from 1.88 to 2.52 percent. Nearly 45 percent of all R&D in Canada is funded by the Federal or Provincial governments.

- o Through state-owned enterprises, the Government plays a larger role in Canadian industry than does Government in the United States. Over 300 Crown (i.e. government-owned) corporations received a total of \$5.5 billion in Canadian tax dollars in 1983.

Government ownership occurs in a variety of industries, including electric utilities, steel, pulp and paper, petroleum and natural gas, aerospace, radio, rail, and telephone and telegraph communications.

- o Competition or antitrust policy, is weaker in Canada than in the United States, and is not used as a tool to target particular industries.

In the last 70 years only eight mergers have been challenged in the courts. The most celebrated antitrust case in recent Canadian history involved a uranium cartel, established with the knowledge and consent of the Government. State-owned corporations are not covered by the current law governing antitrust policy.

- o Regulating foreign direct investment can be a strong tool for potential targeting. Canada's Foreign Investment Review Agency (FIRA) reviews all new investment and acquisitions taking place above specified threshold values.

The FIRA appears to restrict foreign direct investment to all industries and does not target its efforts at any one in particular. Following a U.S. complaint to the General Agreement on Tariffs and Trade (GATT) in 1982, the FIRA has been less restrictive in its operation.

- o Only 12 percent of Canadian government procurement falls within the GATT code on government procurement. The remainder is covered by "Buy Canada" policies, but no specific targeting is pursued.

The purchases of the Provincial governments and local governments in Canada are not covered by the Agreement on Government Procurement. Only those government entities specified by the Federal Government must conform their purchasing to the requirements of the code. The vast majority of Canadian official purchases, then, are subject to policies that encourage purchasing from Canadian sources.

- o A single Government financial institution, the Federal Business Development Bank (FBDB), makes loans to private industry. Its assets are equal to 1 percent of those of the commercial banking system.

The FBDB is a Crown corporation that supplies both capital and technical assistance to innovative firms that can demonstrate a reasonable expectation for a venture's success while at the same time obtaining some funding from sources other than the FBDB. The forms of assistance include loans, loan guarantees, equity financing, leasing, technical services, or combinations of these. In fiscal year 1984 the FBDB authorized loans to Canadian business in the amount of \$321 million.

- o The Canadian tax code does not favor specific industries; it does contain writeoffs for R&D across industrial lines.

A tax credit ranging from 20 to 35 percent for R&D expenditures is allowed. The portion of R&D expenditure which remains after the tax credit is fully deductible.

- o Canada's National Energy Program, consisting primarily of price controls on oil and gas and ownership restrictions, is gradually being phased out. Consequently, Canada has allowed the domestic price to become closer to the world price, and has also relaxed its goal of achieving 50 percent Canadian ownership of the domestic oil and gas industry by 1990.

The pegged oil price has been gradually changed since 1980 from 75 percent to 90 percent of the world level. At the same time, the falling world oil price has reduced exploration activities. Consequently, the Government has encouraged drilling projects by domestic- and foreign-owned companies providing seed money through the Petroleum Incentives Program (PIP) grants.

Korea

- o The Korean Government uses a variety of measures to target selected industries for growth and development. Industries targeted for development since the mid-1970's include large-scale heavy and chemical industries such as steel, petrochemicals, shipbuilding, and machinery. Automobiles and electronics industries have also been targeted for development. The main objective of targeting in Korea is to develop exports.

Targeting techniques in Korea include protecting the home market by restricting imports and foreign investment, by using tax incentives to encourage R&D and investment in selected industries, by directing financial assistance, and by encouraging mergers to create larger more efficient industries. The comprehensive 5-year economic development plans provide guidance for the type and amount of assistance to be provided to each targeted industry.

- o Korea maintains an import licensing system, some import bans, and tariffs to protect its home market.

Permits to import restricted items typically require the approval of the relevant trade association and are usually granted only when similar items are not produced domestically. Automatically approved items are also subject to certain restrictions that inhibit their import. Import protection is targeted at primary products, foodstuffs, machinery, and electronics and electrical equipment.

- o In some product categories, the import licensing liberalization program has been offset by increases in tariff levels that effectively prohibit imports of newly-liberalized items.

In spite of recent liberalizations, many products are still restricted from the Korean market. The Korean tariff plan is flexible, and includes such measures as emergency tariffs, adjustment tariffs, and tariff quotas. Under this plan, tariffs for certain products can be quickly reduced or increased temporarily to stabilize prices in the domestic market, to protect weak domestic industries, or to curb surges in imported goods. In some product categories, increased tariff levels have been used to effectively prohibit imports of newly liberalized items. The Ministry of Trade and Industry carefully monitors imports to insure that imports of newly liberalized items do not reach unacceptably high levels in the domestic market.

- o A revised Foreign Capital Inducement Law (FCIL) has been implemented since July 1984 to liberalize the investment regime in Korea. However substantial actual and potential barriers to foreign investment continue.

The liberalization affects primarily investment projects of less than \$1 million. In 1984, 297 of 957 sectors are closed to foreign participation, mostly the primary and service industries. The manufacturing sector is open to foreign investment, but with some restrictions.

- o As part of their investment agreements, some foreign investors are still forced to export a portion of their output.

For example, 100 percent foreign-owned electronics manufacturers must export at least 50 percent of their production. Producers of speaker systems and home appliances must export 50 and 30 percent, respectively. Most joint ventures, however, can sell all of their production domestically.

- o Although tax incentives to promote the development of specific industries have been sharply reduced since 1982, incentives remain for certain industries.

Industry-specific incentives exist for the naphtha-cracking, steel, industrial machinery, electronics, shipbuilding, and aviation industries in the form of accelerated depreciation. The machinery and electronics industries have the option of tax credits of 3 to 5 percent of the invested amount or accelerated depreciation. The Korean Government encourages the development of domestic industries through tax incentives for investments in small- and medium-sized industries, export activities, technology and manpower development, and for overseas investment or operations. These incentives include accelerated depreciation, treatment of reserves for various purposes as losses, and/or exemption or reduction of income taxes.

- o The National Investment Fund has played a significant role in the development of some industries in Korea.

NIF funds were available to all businesses in some selected industries at preferential interest rates until the 1970's. The Fund has provided low-cost financing for purchases of domestic machinery, construction of domestic heavy machinery plants, purchases of domestically produced ships, and has provided additional funds for exports on a deferred payment basis. Currently, NIF loans go primarily to the heavy machinery, chemical, electronics, and electric power industries, and to agriculture projects. In 1982, preferential interest rates were abolished for most major NIF loans, although, some preferential rates continue to exist.

- o The Korean Government has committed substantial resources to science and technology research and development.

In addition to supporting research institutes directly, tax benefits are available to them. These include tax credits for technology development reserve funds and development expenses, tax and tariff exemptions for experimental machinery and equipment used for technical development, tax credits for investments to commercialize newly developed technologies, and tax exemptions for royalties from technology sales. Individuals in R&D are exempted from military service.

- o Although the Korean Government is trying to eliminate cartel arrangements and other monopolistic practices, these are permitted where it is considered necessary or beneficial to the rationalization of the industries concerned.

The Government has encouraged mergers in several major industries for reconstruction and rationalization purposes. These industries include the heavy electrical equipment industry, the auto industry, and pharmaceuticals.

Mexico

- o The Mexican Government targets some industries using a variety of fiscal, financial and regulatory tools. The major objective of this targeting is to substitute domestic products for imports in key industries. A wide variety of industries are classified for priority in granting industrial incentives. In effect, however, a smaller number of industries are directly targeted, including automobiles, pharmaceuticals, iron and steel, petroleum, and computers.

Among the priority industries listed for priority treatment by the Government are food processing, agroindustry, mining, petroleum and petrochemicals, electronics, iron and steel, pharmaceuticals, chemicals, textiles, many types of machinery and equipment and a variety of basic consumer goods. The Government lists are used as a guide by agencies granting industrial incentives. Targeting is achieved in the iron and steel industries and the petroleum and petrochemical industries, by means of extensive government ownership, and in the automobile, pharmaceutical, and computer industries, by means of detailed industry specific decrees. Other mechanisms used to promote and regulate priority industries include import licensing and public expenditure.

- o The Mexican Government uses import licensing, more than any other mechanism, to protect the domestic market. Priority industries are generally given easier access to licenses for the import of their inputs.

The licensing system is used to limit or prohibit imports of products produced in Mexico. As an emergency economic measure, the system was expanded during the 1982 debt crisis to cover almost all imports. These controls were eased throughout 1983 and 1984.

- o The Government directs some resources of the public sector to priority industries. Given the dominance of the public sector in the economy, government and public enterprise activities contribute significantly to meeting industrial policy goals.

The public sector accounted for over one-half of total Mexican imports and 84 percent of exports in 1983. Major Government enterprises have been set up in priority industries such as steel and automobile assembly. Public sector investment, which is greatest in petroleum, power, and transport industries, accounted for about 45 percent of total investment in 1983.

- o Although highly regulated and limited, foreign direct investment is prominent in key industries such as computers, automobiles, and pharmaceuticals. Foreign investment restrictions are designed to direct investment toward priority industries.

Mexico's foreign investment laws generally restrict foreign ownership to a 49 percent share in a company. Exceptions are made to attract investors to activities that generate employment, contribute to exports, and introduce important technologies. The de la Madrid administration has indicated that it will be generally more lenient than previous administrations in granting foreign-majority ownership, particularly in the areas of heavy machinery, electronic equipment, transportation equipment, chemicals, high-technology goods, and in the hotel industry.

- o In-bond export processing plants constitute a special class of foreign investment. Investments in in-bond processing plants receive exemptions from many regular foreign investment restrictions.

Granting permission for 100 percent foreign ownership of in-bond processing plants is common. U.S. firms figure prominently in this type of investment, which was initially a program for border areas. To promote regional development goals, the Government is now encouraging establishment of these plants in priority regions outside border areas. Textiles, electronics and electrical machinery, and autoparts are important in-bond products.

- o Mexican tax incentives are designed to meet the general development goals of the national plans as well as the specific goals of encouraging regional development, expanding small and medium business, and promoting selected industrial activities.

The major industrial tax incentive program in Mexico is Certificados de Promocion Fiscal (Ceprofi). From 1979 to 1981, over 70 percent of Ceprofi benefits went to the minerals, basic metals, and chemical industries. Another tax incentive program, Certificados de Devolucion de Impuestos (Cedi's), which was linked to export performance, was temporarily suspended in 1982 and has not yet been reactivated. In order to qualify for tax incentives under these programs, a company often commits itself to production targets, levels of domestic content, export percentages of production, and other performance requirements negotiated with the Secretariat of Commerce and Industrial Development.

- o The overall structure of rates of tax programs such as depreciation rates and value-added tax rates favors certain industrial activities.

For example, the annual rates for straight-line tax depreciation for the costs of computers and construction-related transport equipment are among the highest at 25 percent per year. Also, for many foods and medicines, value-added taxes are reduced from the general 15-percent rate and they are held at zero for sales of agricultural equipment and certain services.

- o The Mexican Government uses the authority of the central bank over banking system reserves as well as the resources of official lending institutions to encourage commercial bank lending to economic activities of priority to the Government.

One of the most important lending programs is article 94 of the banking law under which 25 percent of commercial bank reserves must be loaned to specific industrial sectors at rates stipulated by the central bank. Another important aspect of government control over credit allocation is the magnitude of lending by official banking institutions, referred to as development banks. Development banks accounted for 50 percent of total banking system assets, and for about 45 percent of total bank lending in 1983. Development banks lend most heavily to the agriculture and infrastructure sectors.

- o Government trust funds are direct lines of financing set up to promote industrial priorities. These funds are offered at discounted interest rates.

Each trust fund has its own specific objectives. The major trust funds are to promote small and medium business, expand productive capacity, encourage regional decentralization, and stimulate exports. The national development bank, Nacional Financiera, is a major administrator of industrial trust funds. In its total trust fund portfolio, almost 60 percent of lending goes to manufacturing of food products, textiles and apparel, and metal and electrical products and machinery.

Taiwan

- o The Taiwan authorities have used a number of policy tools to enhance the competitiveness of particular industries and to encourage them to export. Government ownership, tax incentives, import protection, and below-market loans have been used to achieve these industrial policy goals. Shipbuilding, steel, electronics, textiles, and machinery, among others, have been targeted for development.

When formal economic planning began in 1953, the government emphasized import substitution, agricultural reform, and light manufacturing. By the late-1950's, however, government policy shifted to encouraging export-led expansion. In the 1970's, the government built state-run firms to make heavy industries and chemicals. Today, the government is seeking to promote high technology industries, such as computers, semiconductors, and electronic machinery, and to integrate more sophisticated manufacturing technology into traditional export lines, such as textiles and apparel.

- o Taiwan's economy and industrial sector have grown rapidly in the past thirty years. Exports were critical to this growth. By 1980, more than half of Taiwan's GDP depended on exports, mostly of industrial goods. The United States was the largest market for Taiwan's exports, buying more than four times as much as Taiwan's next leading customer, Japan.

Taiwan's national income grew on average by more than 10 percent in inflation-adjusted terms from 1961 to 1981 and industry's contribution to national output rose from less than one-third to more than half. The structure of industrial output also changed. Light industry's share of industrial production declined steadily after 1960, while the contribution of machinery, electronics, textiles, chemicals, and metal products industries increased. Manufactured products steadily increased their contribution to exports and accounted for 92 percent of the total in 1982. In 1983, the United States bought more than 45 percent of Taiwan's exports. Major exports to the United States were footwear, textiles and apparel, consumer electronics, and sporting goods.

- o Throughout the postwar period, Taiwan has regulated trade and screened foreign investment to protect local industries and to broaden its industrial base. Imports of nonessential items like consumer products have been substantially curbed, and raw materials and capital goods could be imported with few restrictions.

Discretionary import licensing, outright bans, and high tariffs restrict foreign access to Taiwan's market for textiles, electronics, footwear, toys, sporting goods, paper products, farm machinery, motor vehicles, furniture, and luxury goods. Case-by-case licensing is the principal barrier to imported goods. Licenses for about 80 percent of Taiwan's imports--capital goods and raw materials--are granted fairly automatically. Twenty percent of the value of Taiwan's imports, however, are subject to case-by-case licensing approval by administering officials.

Tariffs and other measures are less significant barriers to imports. Although Taiwan's average tariff rate is high--about 30 percent--actual duties collected as a percentage of total imports are low--just under 8 percent in 1982. This reflects numerous duty-exemptions for exporters and targeted industries, and temporarily lowered duties on specific machinery and equipment. Government procurement in Taiwan also appears to be open to foreign firms and foreign exchange licensing does not appear to be used to influence particular trade transactions.

- o Foreign investment has been an important component of Taiwan's growth. As a result, restrictions on foreign investment are generally limited.

The Government does require foreign investors to buy a fixed percentage of their products from Taiwan sources. But, the Government generally does not require foreign investors to form joint ventures with Taiwan firms, even in strategic sectors. Because of the high quality of Taiwan's products and the small size of the domestic market, local content and export performance requirements do not seem to inhibit foreign investment.

- o Foreign investment in Taiwan totalled over \$3 billion by 1981. The United States is the leading source of such investment. This investment has played a crucial role in the growth of certain industries, notably electronics.

Foreign-owned firms dominate the electronics industry and play a significant role in the textiles, chemicals, and machinery industries in Taiwan. Over one-fourth of the some \$3 billion in foreign direct investments in 1981 went to the electronics industry. Foreign investment accounts for over one-half of total investment in that industry, and is also substantial in the textiles and apparel, machinery, and chemicals industries. The United States is the leading foreign investor in Taiwan, followed by Japan and European firms.

- o Tax policy has been actively used by the Taiwan Government to target industries. In 1983, tax exemptions were 8 percent of gross domestic capital formation. Exporters receive the most tax benefits.

The Government currently uses the tax system to encourage strategic industries, to promote the production of high-value-added goods, and to reward export-oriented firms. Incentives include up to a 9-year tax holiday, along with duty rebates, and exemptions from domestic transactions and excise taxes. Although the Government has attempted to encourage other activities by the use of tax incentives--such as research and development, pollution prevention, and public stock listings--it has been largely unsuccessful. Export tax incentives are the most widely used, but benefits for targeted industries are more concentrated in particular segments of targeted industries, such as large-scale steel production and sophisticated machine tools.

- o Taiwan's financial system is tightly controlled by the Government.

Alternatives to Government-controlled banks such as the equity and venture capital markets are not fully developed. As a result, private industry relies on loans from Government-controlled banks for between 70 to 80 percent of their capital requirements.

- o Public enterprises, which produced one-fifth of Taiwan's industrial output in 1983, received more than one-fourth of all bank loans.

Government enterprises dominate Taiwan's steel, petrochemical, shipbuilding, fertilizer, cement, and aluminum industries. In 1983, 7 out of the top 10 companies (in terms of gross revenues) in Taiwan were government-owned. The Government-dominated utility, petrochemical, communications, and shipping industries took a large share of borrowed funds in Taiwan.

- o Several Government-controlled financial institutions provide credit to targeted sectors on concessional terms. These banks had about \$2.5 billion in loans outstanding in 1983.

The principal industrial policy bank, the Bank of Communications, had outstanding loans of \$2.2 billion at the end of fiscal year 1983. More than one-half of these loans were used to fund infrastructure projects. In the manufacturing sector, the primary recipients of such loans were the chemicals, textiles, metals, transportation equipment, machinery, and electronics industries. The Export-Import Bank had outstanding loans of about \$187 million in 1983, mainly to the machinery and shipbuilding industries. Nearly one-third of direct export loans were made by this bank in 1983, while one-third of total export loans were guaranteed by the Export-Import Bank. Another \$25 million was directly invested on an equity basis in targeted industries, particularly the electronics and machinery industries.

- o The Government is attempting to raise the level of industrial technology in Taiwan through Government-sponsored research and tax incentives.

Taiwan aims to raise expenditure on R&D by 15 percent each year until 1990. This would increase R&D spending as a share of GDP from 0.6 to 2.0 percent. The Government intends to supply one-half of those funds directly, while indirectly supplying another 20 percent through public enterprises. R&D expenditures will be concentrated in computers, semiconductors, shipbuilding, automation, and industrial materials. It is also supplying success-conditional loans for R&D projects--that is, the loans need not be repaid if the commercial production which follows the R&D project is not profitable--particularly those for computers, machinery, and electronics. The government has had a difficult time prompting firms to increase their expenditures on R&D.

- o Taiwan hopes to attract major foreign firms to its science-based industrial park. Wang Laboratories, IBM, and AT&T are among the U.S.-based firms already making such investments.

The park brings together Government and private research institutes, universities, and leading high-technology firms. The Government will provide firms with substantial tax incentives, concessionary financing, and low land costs in return for substantial technology transfer to domestic firms. Nevertheless, by 1984, occupancy rates in the park were well below projected levels.

Targeting Practices in Specific Industries

- o Aerospace

Brazil.--Financial support is provided for the privately owned but Government-controlled company airplane manufacturer, Embraer. Tax credits are also available to purchasers of Embraer stock. Furthermore, through its science and technology spending, the Government has trained aerospace engineers and has built a research center devoted to aerospace.

Canada.--The Canadian aerospace industry receives official Government support by three means: (1) research and development, (2) export development assistance, and (3) Government ownership. The two major Canadian air frame manufacturers, de Havilland and Canadair, were purchased by the Government in 1974 and 1976 for \$40.5 million and \$46.6 million, respectively. With this action and continuing support, direct government ownership and equity investment constitute the major means of Government support to the industry today.

o Automobiles

Brazil.--Foreign manufacturers have been encouraged to invest with special tax, financial, and foreign-exchange incentives. They have also been encouraged to use Brazilian-made auto parts and gradually to export automobiles. The Commission for the Granting of Fiscal Benefits for Special Export Programs (BEFIEEX), requiring a contractual commitment to export in exchange for an incentive package, has been extensively used with auto exports.

Canada.--Automotive trade between the United States and Canada is governed by the Automotive Products Trade Agreement (APTA), which established free trade between the two countries in automobiles and new automotive parts in 1965. The APTA effectively created a single industry on both sides of the border. The agreement was implemented differently in Canada than in the United States, and the Canadians extend the duty-free treatment terms of the agreement only to bona fide automobile manufacturers.

Korea.--The automobile industry has been designated a strategic industry and as such receives priority access to Korea's limited credit facilities and other export incentives. The Korean domestic auto market is heavily protected by import restrictions and local-content requirements.

Mexico.-- Since 1962, the Government has issued regulatory decrees to expand domestic assembly of automobiles for the domestic market and to develop Mexican autoparts-manufacturing industries. Import barriers, domestic-content requirements, financial incentives, and tax rebates are a few of the tools used to implement the auto decrees. Under the 1983 decree, export incentives figure more prominently than under previous programs.

Taiwan.--The six auto companies in Taiwan are currently protected by high tariffs and a complete ban on some products. Local-content requirements force the manufacturers to purchase many relatively expensive parts from domestic suppliers. The Government plans to offer direct funding and low-cost loans to car firms for expansion of production capacity. The Government has also promoted a joint venture between Japan's Hino truck company and domestic firms.

o Computers

Brazil.--Certain segments of the market for computers and related equipment are reserved for Brazilian national firms. This market reserve policy prohibits foreign direct investment and imports in the affected markets to entice local investors to enter the market. The policy is accompanied by incentive programs of subsidies and tax relief.

Korea.--Computers and semiconductors were designated strategic industries in the early 1980's. These industries receive a number of tax and other financial incentives to promote growth and development and are protected from imports. The Government is encouraging the telecommunications industry to develop through joint ventures and technology-sharing arrangements with foreign companies.

Mexico.-- A sectoral plan, adopted in 1981, proposed techniques to reduce imports of computer and electronics equipment by expanding domestic production of these products. Under the plan, computer firms receive both export and production incentives such as financing, tax credits, and tariff rebates. To increase the use of Mexican-made components, the Government negotiates domestic-content levels with each major manufacturer of computer systems and related equipment.

o Electronics

Taiwan.--The Taiwan Government is attempting to encourage the semiconductor, consumer electronic, computer, and telecommunications segments of the electronics industry by providing protection from imports and initiating numerous research and development projects in those fields. The Government is also seeking to finalize a technology transfer and production agreement between AT&T and Taiwan firms. Although firms in the industry received less than 3 percent of development bank loans, they received more than one-half of the seed money provided by the Government to high-technology industries in 1982 and nearly one-third of such money in 1983.

o Heavy Electrical Equipment

Brazil.--Establishing the domestic industry and reducing imports have been accomplished by Government procurement policies emphasizing a high national content. In 1983, all but about \$150 million of the approximately \$1.2 billion spent on heavy electrical equipment was spent on equipment made in Brazil. As the planning and coordinating authority for the Brazilian electrical power projects, ELETROBRAS has promoted the rapid growth of domestic content in power projects.

Korea.--As part of its energy plan, the Government has targeted the heavy electrical equipment industry for promotion and rationalization. To this end, the Government has encouraged mergers among heavy electrical equipment producers and allocated funds to help develop a Korean standard nuclear power plant and equipment.

o Footwear

Brazil.--Targeting has consisted of tariff exemptions on imported equipment and raw materials and also other tax and financial incentives as one of the Government-approved industries throughout most of the 1970's. More recently, the industry has received preferential working capital financing for exports, income tax reductions for its export earnings, and reductions in certain value-added taxes tied to the amount of exports.

o Machine Tools

Korea.--The Government offers a variety of incentives to upgrade tooling and to expand production, including subsidized loans, tax exemptions and reductions, and import protection. A series of special purpose Government funds and loans programs promote demand for machine tools.

Taiwan.--The Government of Taiwan is trying to steer the domestic machine tool industry into production of high-technology goods, such as numerically controlled machine tools and flexible manufacturing systems. Government-sponsored research has helped domestic firms build flexible manufacturing systems, machining centers, and robots. The machinery industry is also eligible for numerous tax benefits and below-market loans. In 1983, it received about 4 percent of all concessional loans, but it received nearly one-fourth of all seed money for high-technology firms.

o Petroleum/gas

Canada.--The "Canadianization" initiatives of the early 1980's are an important part of Canada's industrial policy for petroleum. The National Energy Program (NEP), established in October 1980, has as its foremost goal to increase Canadian ownership of the oil and gas industry to 50 percent by 1990. The Government has offered a variety of incentives and programs to benefit Canadian-owned and Canadian-controlled corporations and to see that the objectives of the NEP are accomplished. The National Energy Board imposes export approval requirements for oil, natural gas, and electricity in Canada. Before such exports can be authorized, the requirements of the Canadian economy must be anticipated. The Petroleum Incentives Program replaces the nondiscriminatory depletion allowance with incentives for oil exploration development. Canada continues to maintain oil and gas price controls.

Mexico.-- A Government-owned enterprise, Petroleos Mexicanos, is a monopoly for extracting, refining and distributing petroleum and natural gas. Since the industry is a major source of government revenue, major public investments have been made to develop and expand the industry.

Taiwan.--The Government runs the only firm providing basic petrochemical feedstocks in Taiwan: the State-owned Chinese Petroleum Corporation. It uses CPC's pricing policies to help downstream producers become more competitive. The industry received a large share of below-market loans in 1983 and received substantial research assistance.

o Pharmaceuticals

Brazil.--To reduce foreign dependence and encourage local ownership, price controls have been used to rigidly control the price of drugs. Even when price controls were relaxed for most products, from 1980 to early 1983, controls were maintained for pharmaceuticals.

Korea.--The Government has indicated a desire to rationalize the industry by reducing the number of small firms and making large firms more competitive. An increase in public funding for R&D projects is planned.

Mexico.-- A decree, issued in February 1984, established a generic drug program, levels of required research and development investment, and Government procurement preferences to promote Mexican production of essential drugs at low prices. Mexican-owned drug companies are also eligible for various financial and fiscal incentives. The decree requires that all drug companies gradually increase purchases of domestically made raw materials and begin to raise exports to levels that will balance their import requirements.

Taiwan.--The Taiwan Government is attempting to upgrade the pharmaceutical industry by adopting internationally recognized standards for good manufacturing processes, as well as restricting import competition. Imports of drugs that are already registered by qualified Taiwan enterprises will be banned, except for those requiring special manufacturing techniques. Despite official encouragement, local producers do not believe that they will be able to meet international standards within 5 years.

o Semiconductors

Brazil.--Through a market reserve policy foreign investment is prohibited in certain parts of the semiconductor industry. Also the Government attempts to limit the level of semiconductor imports and to pressure Government-controlled telecommunications companies and private enterprises in computer/peripherals, consumer electronics, and electronic process control to purchase from domestic suppliers.

o Shipbuilding

Brazil.--With Government financing to stimulate shipbuilding, Brazil became one of largest shipbuilders in the world by the early 1980's. Since 1958, one of the main sources of funding has been the Merchant Marine Fund. Since early 1983, however, this fund and other funding of shipbuilding has been carried out by the National Economic and Social Development Bank, BNDES. BNDES provides export financing with interest equalization loans that subsidize rates of foreign commercial bank loans for a ship purchase to the level of subsidized European rates.

Korea.--Government support to the shipbuilding industry is primarily provided through low-cost loans to producers and through subsidizing the export-finance system. The Government has attempted to rationalize the shipping industry through mergers.

Taiwan.--The shipbuilding industry in Taiwan is almost completely Government owned. By 1982, the country was the third largest shipbuilder in Asia, after Japan and Korea. The industry receives a substantial portion of Government development loans, as well as below-market export financing.

o Steel

Brazil.--Aid to the steel industry has taken place through preferential working capital financing, Government provision of equity capital, assistance in paying foreign loans, subsidized export financing, tax credits for exports, and other measures. In 1983, about 20 percent of the funding of the State-owned development bank went to the steel industry. In 1983, the U.S. Department of Commerce estimated that the value of countervailable subsidies to range from 11.72 to 27.42 percent of the export price.

Korea.--The steel industry is considered the most important of Korea's basic industries. For these reasons, the Pohang Iron & Steel Co. is eligible for various types of administrative and financial support from the Government; however, major assistance was abolished at the beginning of 1983.

Mexico.--Government enterprises are heavily involved in the production and marketing of steel. Of the five major Mexican steel producers, three are wholly owned by the Government. Under the Portillo Administration, a Government entity, Siderurgica Mexicana, was set up to coordinate management and marketing activities of the State-owned companies. In 1980, Government-run operations accounted for 57 percent of total Mexican steel production. Substantial Government resources are devoted to this industry, which is considered key to increasing production of capital goods. Major expansions of steel industry construction capacity are underway, although slowed somewhat by the debt crisis and foreign-exchange shortages.

Taiwan.--Taiwan appears to be developing an efficient and rather substantial steel industry despite the fact that until recently the country has had only a small steel making capacity. Taiwan has accomplished this growth largely through the State-owned China Steel Corporation. Despite a Government desire to improve steel self-sufficiency, very little is being done to protect the industry from imports. Indeed, imports from the United States and Japan have increased since 1977--in the case of Japan, by more than 100 percent.

o Telecommunications

Brazil.--As the sole purchaser of telecommunications equipment, the Government has had considerable success in promoting import substitution and Brazilian ownership of companies operating in Brazil. By 1981 imports of telecommunications equipment had fallen to \$107 million from \$315 million in 1975. During the last five years, foreign manufacturers with established operations in Brazil--Ericson, ITT, GTE, Philips, Siemens, Plessey and NEC--have been forced to take on Brazilian partners as majority shareholders.

Canada.--The Canadian Government promotes the telecommunications industry through restrictive foreign investment and Government procurement policies, direct assistance to domestic firms, restrictions in the places data can be processed, and discriminatory tariffs and customs procedures. The Government does not encourage foreign investment in telecommunications transmission, because Canadian ownership of these facilities is considered of national importance. The Canadian Government and telephone companies have emphasized a "buy Canada" policy by encouraging the private sector to purchase Canadian telecommunications equipment. The government has also increased financial assistance to domestic telecommunications firms.

o Textiles and Apparel

Brazil.--The textile and apparel industries have received investment benefits from 1969 to 1980 including (1) reduced import duties, (2) reduced border taxes on imports, (3) a waiver of prior deposit on imports, (4) access to official subsidized credits, (5) exemption from certain value-added taxes for the purchase of domestically produced capital goods, and (6) allowance of accelerated depreciation for income tax purposes for the use of domestic capital equipment. Since 1981, CDI has not approved textile apparel products for investment benefits. However, many of the benefits available to companies that export have been retained.

Korea.--The Government has in the past intervened in its apparel industry through nontariff barriers and financial incentives to build up the domestic industry and to expand exports. Since 1983, the barriers have been progressively reduced, and the industry no longer receives special benefits. The Government is providing financial incentives to encourage new investment in upgrading equipment used in production to improve output and quality.

Taiwan.--Government policy towards the textiles industry has sought to ensure that low-cost feedstocks such as petrochemicals were available and has restricted imports into Taiwan. The textiles industry also received about 8 percent of Government development bank loans in 1983.

Targeting: Definition and Effects 1/

Definition of Industrial Targeting

Industrial targeting, as used in this study, means coordinated government actions taken to direct productive resources to help domestic producers in selected industries become more competitive. There are four elements to this definition: (1) there is coordinated government action; (2) productive resources are directed; (3) only selected industries are targeted; and (4) the purpose is to provide domestic producers in these industries with a competitive advantage. This definition is quite broad and includes defensive targeting, where the goal is to gain sales in the domestic market, as well as export targeting, where the goal is to gain sales in foreign markets. Nevertheless, the definition restricts the types of actions that are labeled as industrial targeting.

The first element in the definition restricts targeting to government actions. Strategies of individual firms, such as investment and marketing strategies, are not included. For example, a conglomerate may finance research on production in a particular industry out of its revenues in another industry. However, unless this strategy is at least encouraged by some form of government action, it is not industrial targeting, although the results might be the same. The important difference between the two is that targeted firms stand to benefit from government actions, whereas other firms only reap the rewards or suffer the consequences of their own actions.

The second element of the definition requires that productive resources be directed. Examples of government actions that direct resources are preferential tax treatment; government subsidies (either outright or in implicit forms such as loan guarantees or favorable terms on loans to finance investment, research and development, or export sales); special legal treatment (such as exemption from antitrust laws); government procurement preferences; and restrictions on imports. In some cases, a government statement of policy can cause resources to be directed to domestic producers in selected industries. For example, if a government announces its intention to underwrite losses of its local producers in a selected industry, competing producers in other countries may be discouraged from investing in the industry, but local producers in the industry are encouraged to invest more, even though no actual government payments may occur. The government announcement removes the risk to domestic firms, but in so doing, increases the risk to its foreign competitors.

1/ For a more extensive discussion of the definition and effects of industrial targeting, see U.S. International Trade Commission, Foreign Industrial Targeting and its Effects on U.S. Industries Phase 1: Japan, . . . , USITC Publication 1437, October 1983, pp. 17-32.

The third element requires that only selected industries be directly affected. This element is important for distinguishing industrial targeting from more general industrial policies. However, there can be considerable latitude in the meaning of "selected industries." For example, one could consider exchange-rate manipulation by the government as targeting all industries that compete with internationally traded goods. Similarly, a broad program of export-financing subsidies could be considered targeting of all export industries. Here we use "selected industries" in a narrower sense than all traded goods industries or all export industries. For example, although most government export-financing programs exist ostensibly to benefit all exporting industries, export loans tend to be concentrated in certain sectors. This element of the definition helps one to distinguish whether such a program qualifies as targeting or as a broader industrial policy, but it does not provide an absolute rule for making this distinction.

The fourth element requires that the purpose of targeting be to give domestic producers in the selected industries a competitive advantage. This element of our definition restricts our study to cases where the goal of targeting is to increase domestic output in selected industries at the expense of their foreign competitors. Both defensive targeting and export targeting can have such a objective which might be consistent with a wide range of ultimate goals of industrial targeting. Ultimate goals of targeting can be to increase domestic employment opportunities, to improve the productivity of domestic labor, or to enhance overall domestic economic development and growth. Other goals include self-sufficiency in agriculture, raw materials or energy, or a strong national defense. These other goals usually are reached by increasing the international competitiveness of domestic producers in selected industries.

This element of the definition does not include government policies to increase production in sectors where there is too little private investment because of external factors--that is, where private investors cannot capture all of the benefits that come from their investments. These sectors include public goods such as education, the development of infrastructure to aid economic development (for example, roads, communication networks, public water, and sewage networks), medical research, and pollution control. Government action to direct productive resources into these sectors is not directly oriented toward increasing domestic output in selected industries at the expense of competing foreign producers.

Industrial Targeting and Overall Competitiveness of a Nation's Industrial Output

When examining the possible effects on U.S. producers of foreign targeting, it is important to distinguish between the effects on specific industries and the aggregate effects on all industries. Those who warn of the dangers of foreign industrial targeting fear that such policies can cause foreign industries to become more competitive at the expense of total U.S. industrial output, where the loss in U.S. industrial competitiveness is measured as the movement toward deficit in the U.S. industrial trade balance. Clearly, a foreign government can direct resources to a specific industry or group of industries to the detriment of competing U.S. suppliers. But the foreign government cannot use such actions to improve competitiveness of local

producers in all industries, except for limited time periods. The following discussion explains how foreign targeting can affect the aggregate U.S. trade balance in manufacturing. The analysis points to the factors that need to be considered in gauging these effects.

First, consider the ways in which a country can improve its overall trade balance. To export more than it imports in any year, the country must either lend or give to foreigners the differences between the export receipts and the payments for imports. To run continuous surpluses, the country must maintain a constant net outflow of loans or gifts. This is true whether exchange rates are fixed or flexible. Under fixed exchange rates, an outflow of loans can consist of either net private lending to foreigners or net official purchases of foreign exchange by the U.S. Treasury. If exchange rates are perfectly flexible, the outflow must consist entirely of private loans, because U.S. officials would not buy foreign exchange. Thus, an industrial policy that improves international competitiveness of all local producers (causing a trade surplus) is equivalent to a policy of promoting loans and gifts to foreigners.

Attempts to improve competitiveness of local industries through subsidies, tax breaks, or other stimuli cannot succeed across all industries, except to the extent that they promote international financial flows. Even if the stimuli came from a reduction in resources allocated to government, so that a subsidy or tax break to one industry did not merely amount to a tax increase for another, the exchange rate would automatically move to offset the total trade balance effects of the stimuli. 1/

Even industrial policies that promote loans to foreigners can help the trade balance for only a limited time. If a country is making net foreign loans, it is also building up pressure for a time when it will have to either lose competitiveness or turn its loans into gifts. This is true even if the foreign loans are never fully repaid. Net loans in 1 year will provide a positive trade balance stimulus for that year, but no further stimulus in later years. On the other hand, the receipt of payments of interest and principal on the loans will provide negative trade balance stimuli in every succeeding year until the loans are repaid. Only by ever-increasing outflows of new loans can a country maintain a trade surplus for a number of years.

Although industrial policies can be targeted to help specific sectors, they cannot permanently help the overall trade balance. Thus, industrial targeting must eventually harm the international competitiveness of nontargeted local producers by the same amount that it helps the targeted

1/ This reaction of exchange rates is well recognized in international agreements. A good example is the value-added tax with border tax adjustments used by the European countries. These countries levy a value-added tax on imports, and they rebate their own value-added tax on goods that are exported. Thus, they would appear to tax imports and subsidize exports. However, the General Agreement on Tariffs and Trade (GATT) recognizes the trade neutrality of these taxes and the fact that they do not encourage any incipient trade surpluses on the part of the European countries.

ones. For example, if a country's targeting helps its entire industrial sector, it must eventually harm the competitiveness of its nonindustrial sectors that compete internationally. Conversely, the only way foreign industrial targeting can cause long-term deindustrialization in the United States is by increasing the competitiveness of our nonindustrial exports, such as food and services.

This report concentrates on the effects of foreign industrial targeting on specific industries. It does not attempt to determine the effects on the overall international competitiveness of U.S. manufacturing. These overall effects are likely to be quite small because of the small foreign expenditures on targeting relative to total foreign manufacturing output. They may even be negative, since most foreign governments follow vigorous programs to aid local agriculture, and, as we have seen, these programs will decrease the competitiveness of foreign manufacturers.

BRAZILIAN INDUSTRIAL POLICY AND TARGETING

The Brazilian State has been extensively involved in directing its economy. The following describes the major elements of this effort beginning with 1946, when rapid industrialization, control over the exploitation of natural resources, and the provision of public utilities became important economic objectives.

Historical Overview

Growth of industry, 1946-63

During this period, the Brazilian economy changed from a predominantly agricultural-based economy to an industrial one. ^{1/} Between 1947 and 1966, the sectoral share of GDP attributed to industrial activity grew from 19 to 27 percent, but that of agriculture fell from 27 percent to 19 percent. The high share of GDP attributed to manufacturing is today exceeded in only five other developing countries.

Another major change also took place within the industrial sector: industries making intermediate goods, durable consumer goods, and capital goods replaced nondurable, consumer goods industries as the fastest growing industry sectors. For example, in the late 1950's and early 1960's, the textiles and footwear industries grew by only 3.5 and 1.4 percent per year, respectively, but the automobile and electrical machinery industries grew by over 20 percent per year. According to the World Bank, the traditional industrial sectors--food, beverages, tobacco, textiles, garments, footwear, furniture, and printing--dropped from 66 percent of domestic manufacturing value added in 1949 to 46 percent in 1964.

A major reason for this shift toward durable goods and capital equipment has been the policy of import substitution industrialization (ISI) followed by the Brazilian Government. ISI consists of a number of programs that have formed part of Brazilian industrial policy until today. Among these is the Law of Similars. Begun in 1911, the Law of Similars provided for the registration of domestically-made products that were similar to imported products. In the post-Second World War period these "similars" were rewarded with considerable tariff and nontariff protection. For example, domestically-made similar products were protected by a provision requiring that only the most disadvantageous of the Brazilian Government's multiple exchange rates could be used to purchase competitive imports.

^{1/} The information contained in this section comes primarily from the following sources: Werner Baer, The Brazilian Economy, Praeger, 1983; William G. Tyler, The Brazilian Industrial Economy, Lexington Books, 1981; Brazil, A Country Study, ed. Richard F. Nyrop, Foreign Area Studies, American University, 1982.

The ISI policy combined with the large size of the Brazilian market to attract large amounts of foreign direct investment. The first data available on the extent of foreign ownership of Brazilian industry show that, in 1971, foreigners held 34.4 percent of the equity in industrial enterprises. In addition, foreign investors were attracted to Brazil by another important and early aspect of Brazilian industrial policy: Government financing of industrial projects at long-term, subsidized rates. The National Bank for Economic Development (BNDE), an important, State-owned development bank established in 1952, was especially prominent in promoting the automobile, shipbuilding, and heavy machinery industries in the 1950's. ^{1/} In addition to subsidized investment capital, these favored industries were given special treatment for importing manufacturing equipment, raw materials, and other inputs to production.

Another policy tool that became important during the Second World War and continued thereafter was Government ownership of industry. During the war years the Government created the National Steel Company (CSN), the Companhia Vale do Rio Doce (CVRD), the National Alkali company, and the National Motor Factory. The BNDE promoted this process by becoming the majority shareholder of three steel firms (USIMINAS, COFAVI, and COSIPA). Petrobras, initially a State monopoly in petroleum exploration, was also formed during this period. Table 1--dealing with the proportion of sales in several major industries attributable to domestic, foreign, and State ownership--shows the extent of State ownership in steel, chemicals, petrochemicals, and mining industries.

The rapid industrialization during 1946-63 was accompanied by an increase in GDP of 6.3 percent per year. Most of this growth came from the industrial sector, which more than tripled in size. Other notable changes during this period were that Brazil's external debt went from \$590 million to \$3.5 billion, and the inflation rate rapidly increased from the 12-20 percent level from 1946 to 1960 to 81 percent in 1964.

1964-1967

In response to the foreign debt and the inflation of the early 1960's, the Brazilian Government chose to reduce public expenditures, raise taxes, and devalue the cruzeiro, the Brazilian currency, on a more frequent basis. This effort to keep the official value of the cruzeiro in line with its market value reflected a growing emphasis on exporting. Furthermore, some taxes on exports were eliminated and licensing procedures and other restrictions were changed to make selling abroad easier. The net effects of the economic cut back of the mid-1960's were to reduce GDP growth to approximately one-half that of the preceeding years and to reduce inflation from 87 to 27 percent. The trade liberalization caused both imports and exports to grow.

^{1/} In 1982 the name was changed to the National Bank for Economic and Social Development, or BNDES.

Table 1.--Brazil: Share of sales in industries owned by domestic, foreign, and State firms, 1981

(In percent)				
	Domestic	Foreign	State	Total
Domestic dominance:				
Housing construction-----	100.0	-	-	100.0
Sales of motor vehicles-----	100.0	-	-	100.0
Communications-----	97.8	-	2.2	100.0
Clothing-----	95.1	4.9	-	100.0
Wood and wood products-----	91.9	8.1	-	100.0
Agriculture-----	95.0	-	5.0	100.0
Retail sales-----	91.2	8.8	-	100.0
Heavy construction-----	88.7	6.0	5.3	100.0
Supermarkets-----	81.3	4.7	14.0	100.0
Food-----	68.5	31.5	-	100.0
Paper and cellulose-----	76.5	23.5	-	100.0
Nonmetallic minerals-----	56.7	43.3	-	100.0
Metal products-----	66.5	33.5	-	100.0
Foreign dominance:				
Wholesale commerce-----	44.7	45.2	10.1	100.0
Machinery-----	40.5	55.3	4.2	100.0
Electrical machinery and goods-----	44.1	55.9	-	100.0
Automotive parts-----	44.0	56.0	-	100.0
Textiles-----	45.5	54.5	-	100.0
Transportation products-----	27.6	62.5	9.9	100.0
Beverages and tobacco-----	31.0	69.0	-	100.0
Hygienic and cleaning goods-----	28.7	71.3	-	100.0
Plastics and rubber products-----	25.4	72.1	2.5	100.0
Communication and office products-----	16.9	76.2	6.9	100.0
Petroleum distribution-----	10.8	59.2	30.0	100.0
Pharmaceuticals-----	11.5	80.5	-	100.0
Automobile assembly-----	2.0	98.0	-	100.0
State dominance:				
Public utilities-----	-	-	100.0	100.0
Chemicals and petrochemicals-----	7.8	11.0	81.2	100.0
Mining-----	28.3	9.6	62.1	100.0
Steel-----	26.6	10.5	62.9	100.0
Transport services-----	43.9	2.4	56.1	100.0

Source: "Os Melhores e Maiores," Exame, Setembro 1982.

Note.--Each sector includes the 20 largest firms.

The "Brazilian Economic Miracle," 1968-73

The period from 1968 to the oil price increase of 1973 is considered the period of the Brazilian Economic Miracle. During this time, manufactured output grew by an average rate of 12.9 percent. Imports and exports as a share of GDP increased significantly, in part because the trade-promoting policies of 1964-68 were continued.

In spite of the general "pro-market" nature of the policies of these years, the number of State-owned companies increased significantly. Between 1968 and 1974, 231 new public enterprises were begun: 42 in manufacturing; 12 in mining; 2 in agriculture; and 175 in basic services. Not only did Government firms grow in number, but in size as well. Government ownership of Brazil's 30 largest nonfinancial firms (those with the greatest net assets) increased from 13 in 1967 to 23 by 1974.

The oil and debt crises, 1974-present

Much of the Brazilian economic crisis of 1983 can be traced to decisions made in 1974. Primary among these was the decision to maintain the pre-1974 growth rates following the rapid rise in oil prices. This resulted in two other decisions. First, considerable funds were borrowed from overseas banks to continue large projects of the State-owned companies such as the Tucuruí hydroelectric station (\$6 billion) and the Acominas steel mill (\$5 billion). Altogether about one-half of Brazil's officially guaranteed debt, which increased from \$12.6 billion in 1973 to \$51 billion in 1979, was borrowed to finance such projects. Second, the Government sheltered the economy from the full effect of the oil price rise by maintaining an overvalued cruzeiro. In spite of the periodic devaluations (a crawling-peg system), the cruzeiro is estimated to have been overvalued by 25 to 35 percent between 1974 and 1979. ^{1/} An overvalued cruzeiro was complemented by very high nominal tariffs to keep nonessential imports from flooding the country. The Government then had to resort to export subsidies in order to counter the export-dampening effects of the overvalued currency. Nonetheless, between 1974 and 1980 the value of imports doubled.

During the Multilateral Trade Negotiations (Tokyo round) of the late 1970's, Brazil committed itself to eliminating its export subsidies. Hence, the various fiscal incentives for exports began to be phased out in 1979. To keep exports competitive without subsidies, the phaseout was accompanied by a 30-percent "maxi-devaluation" of the cruzeiro against the U.S. dollar. As the rate of inflation increased from 40 percent in 1978 to 211 percent in 1983, the cruzeiro again became overvalued by late 1980, and the export promoting effects of the 1979 efforts were soon eliminated.

In addition to inflation and an overvalued cruzeiro, other problems reduced Brazil's foreign exchange earnings as well. First, the 1979 oil price increase damaged Brazil's terms of trade. Second, because about two-thirds of Brazil's debt bears interest at rates tied to changes in either the U.S. prime

^{1/} William Tyler, op. cit., p. 34.

rate or the London interbank rate, the terms of trade took another turn for the worse when dollar interest rates increased in late 1979, necessitating ever greater amounts of foreign exchange to service the large debt. Third, the late 1980 collapse in the prices of Brazil's major export commodities--sugar, coffee, and iron--further contributed to the problem.

Finally, many of Brazil's new export markets for manufactured products collapsed as well. Brazil had successfully sought to reduce its dependence on the markets of the major industrial countries by increasing its exports to new markets, such as Mexico, Nigeria, Poland, and Argentina. However, in 1981 and 1982 these economies suffered foreign-exchange problems and were unable to maintain their level of Brazilian imports. To help itself over the immediate hurdles of these combined revenue losses, Brazil continued to borrow until its debt exceeded \$80 billion in November 1982 and its reserves had been drawn down to such perilously low levels that overseas banks would not extend further credits without an IMF ultimatum.

Table 2 shows how all these factors have led to the current crisis. Although external debt and debt service grew to about \$91 billion and \$17 billion respectively in 1984, Brazil was unable to increase its merchandise trade balance in order to offset the new expenses. In fact, the last line of table 2 shows how the value of debt servicing and oil imports combined have exceeded the value of exports since 1979.

The IMF came to Brazil's assistance in December 1982 with a Commodity Financing Facility (CFF) of \$546 million. Another \$500 million CFF drawing and a \$4.9 billion 3-year Extended Fund Facility (EFF) were approved for Brazil on February 28, 1983. Private commercial banks provided \$4.4 billion as part of the IMF plan, and the U. S. Government also lent Brazil a total of \$1.9 billion from November 1982 to February 1985. ^{1/}

In order to qualify for IMF financing, Brazil agreed to an economic adjustment program designed to bring about the structural changes necessary to permit a return to high and sustainable rates of growth in output and employment. However, by May 1983, Brazil failed to comply with the terms of the IMF agreement, and a new program had to be negotiated in July 1983. The basic objectives of this program are to eliminate the Federal Government deficit by balancing the budget and reducing the current account deficit by raising exports and lowering imports. Brazilian efforts in both regards are complicated by the high rate of inflation and almost universal use of indexation whereby the inflation is automatically reflected in wages and prices. Hence, one of the major efforts in curbing both inflation and reducing the public deficit was to declare a 2-year cap on wages indexed at an average of 87 percent of the rise in the consumer price index. Furthermore, State enterprise investment budgets have been cut by 19 percent (in real terms), and their current expenditures have been cut by 5 percent. Taxes have been raised, and subsidies for basic commodities and for credit have been reduced. To reestablish the parity of the cruzeiro and promote exports, the currency is devalued frequently.

^{1/} The Financial Times, Mar. 1, 1983, and Wall Street Journal, Aug. 30, 1983.

Table 2.--Brazil: Balance of payments and foreign trade indicators, 1972-84

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983 1/	1984 2/
	U.S. \$ millions												
1. Merchandise trade balance	-252	-61	-4,748	-3,549	-2,385	-100	-1,159	-2,717	-2,823	1,184	778	6,500	9,000
Exports of goods	3,941	6,093	7,814	8,493	9,961	11,922	12,473	15,244	20,132	23,275	20,175	21,900	25,000
Imports of goods	4,193	6,154	12,562	12,042	12,346	12,022	13,632	17,961	22,955	22,091	19,397	15,400	16,000
Crude oil	344	606	2,558	3,099	3,354	3,602	4,064	6,264	9,372	10,604	9,831	7,750	6,500
Other	3,849	5,548	10,004	8,493	8,992	8,420	9,568	11,697	13,583	11,487	9,566	7,650	9,500
2. Net interest payments	-413	-581	-730	-1,496	-1,811	-2,103	-2,699	-4,108	-6,310	-9,162	-11,353	-9,700	-10,800
3a. Balance on current account	-1,713	-2,174	-7,560	-6,995	-6,551	-5,115	-7,039	-10,482	-12,848	-11,760	-16,279	-	-
3b. Excluded reinvested profits	-	-	-	-	-	-	-	-	-	-10,993	-14,755	-7,663	-6,000
4. Amortization	-1,271	-1,676	-1,929	-2,185	-3,017	-4,133	-5,274	-6,553	-6,677	-7,642	-8,098	-7,624	-7,891
5. Debt service (2+4)	-1,684	-2,257	-2,659	-3,681	-4,828	-6,236	-7,973	-10,661	-12,987	-16,804	-19,451	-17,324	-18,681
6. Gross borrowing needs (3b+4)	-	-	-	-	-	-	-	-	-	-18,635	-22,853	-15,287	-13,881
7. International liquidity (at end of period)	4,183	6,416	5,269	4,041	6,544	7,256	1,1895	9,689	6,913	7,507	3,994	5,509	8,707
8. External debt, registered	9,521	1,2572	17,166	21,171	25,985	32,037	43,511	49,904	53,848	61,411	70,198	83,457	92,857
External debt, registered and nonregistered	-	-	-	-	-	-	-	-	-	-71,878	83,265	91,913	100,813
9. Index numbers (1970=100)													
Terms of trade in goods													
FOB/CIF	99.7	106.9	90.9	85.4	92.8	100.8	87.6	79.9	67.4	56.1	54.0	-	-
Purchasing power of exports of goods	122.6	163.2	142.3	145.1	160.4	185.8	181.5	188.4	200.9	211.9	188.4	-	-
10. Debt indicators:													
Debt Service/exports or goods (%)	42.8	37.0	34.0	43.3	48.5	52.3	63.9	69.9	64.5	72.2	96.4	79.1	74.7
Net interest payments/exports of goods (%)	10.5	9.5	9.3	17.6	18.2	17.6	21.6	26.9	31.3	39.4	56.3	44.3	43.2
Amortization/exports of goods (%)	32.3	27.4	24.7	25.7	30.3	34.7	42.3	43.0	33.2	32.9	40.1	34.8	31.5
Registered external debt/GDP (%)	15.8	16.1	17.5	18.7	20.8	21.9	23.0	24.4	22.7	24.2	26.6	-	-
Registered external debt/exports of goods	2.4	2.1	2.2	2.5	2.6	2.7	3.5	3.3	2.7	2.6	3.5	3.8	3.7
11. Other indicators:													
Imports of crude oil/exports of goods (%)	8.7	9.9	32.7	36.5	33.7	30.2	32.6	41.1	46.6	45.6	48.7	35.4	26.0
(Debt service + oil imports)/exports of goods (%)	51.5	46.9	66.8	79.8	82.1	82.5	96.5	111.0	111.1	117.8	145.1	114.5	100.7

1/ preliminary or forecast.
2/ forecast.

Source: 1972-1982: Economic Commission for Latin America on the basis of the IMF and the Central Bank of Brazil.
1983-1984: Central Bank of Brazil, Brazil economic program; internal and external adjustment, October 1983.

By the end of April 1984, after receiving a second "jumbo loan" of almost \$11 billion from the IMF, creditor governments, and commercial banks, the program was showing some positive results. ^{1/} The Government ran a budget surplus and the trade balance objective was surpassed, allowing Brazil to reduce its rate of foreign borrowing. The favorable balance of trade, \$6.5 billion in 1983, was the result of an 8.5-percent increase in exports over those of 1982 and a 20.5-percent decrease in imports. Most of the increase came from steel, soybeans, coffee, shoes and chemicals, and most of the increase was exported to the United States. Japan and the European Community also imported more from Brazil in 1983 than in 1982.

The economic difficulties of the last 5 years have led to frequent changes in the programs and the levels of subsidies and investment incentives as the following discussion of Brazil's actual and potential targeting mechanisms shows.

Home-Market Protection

The Brazilian Government has exercised its control over imports, exports, and foreign investment in two principal directions. Throughout most of the post-World War II period, the Government has emphasized import substitution policies to develop the domestic market by raising tariffs, screening foreign investment, expanding the number and scope of State enterprises and maintaining an overvalued exchange rate. However, as the need for foreign currency became acute in the late 1970's and the 1980's, an export-led policy was adopted which involved frequently adjusting the exchange rate and placing more resources in Brazil's export incentive programs. Although the emphasis has changed from import substitution to export expansion, elements of these two directions of Brazilian trade policy have always existed side by side. The main elements of these policies are discussed below.

Imports

For the last 4 years the Brazilian Government has attempted to limit imports as much as possible without at the same time choking off necessary fuel supplies, raw materials, and capital equipment. This effort is reflected in the decline of imports from \$22 billion in 1980 to \$15.4 billion in 1983, as shown in table 3. The high proportion of fuel and raw materials in Brazil's total imports is also reflected in the prominence of the Middle East and Latin America as major sources of imports. The United States is the third largest source of imports to Brazil, with \$1.2 billion in 1983.

Tariffs and import surtaxes.--One traditional tool for limiting imports is high tariffs. Brazilian tariff rates range from 0 and 205 percent ad valorem, with most products falling in the 30- to 85-percent range. ^{2/} In

^{1/} New York Times, Nov. 23, 1983.

^{2/} Brazil is a signatory of the GATT; however, only about 5 percent of its tariff rates are bound, and, hence, in times of economic emergency, Brazil can change most of its tariff rates without regard to international agreements.

Raw materials and finished essential products not produced locally usually pay 0 to 37 percent; products for which national producers have obtained a measure of protection, 16 to 70 percent; and luxury and nonessential goods, 64 to 205 percent.

Table 3.--Brazil: Imports, by main import categories, 1974-83

Year	Fuel and related products	Raw materials	Consumer goods	Capital goods	Total imports
1974:					
Value-----billion U.S. dollars----	2.9	5.6	0.9	3.1	12.6
Percent of total-----	23	44	7	24	100
1975:					
Value-----billion U.S. dollars----	3.1	4.4	0.8	3.9	12.2
Percent of total-----	25	36	7	32	100
1976:					
Value-----billion U.S. dollars----	3.8	4.1	0.9	3.6	12.4
Percent of total-----	31	33	7	29	100
1977:					
Value-----billion U.S. dollars----	4.1	3.9	0.9	3.1	12.0
Percent of total-----	34	26	8	26	100
1978:					
Value-----billion U.S. dollars----	4.5	4.5	1.1	3.6	13.7
Percent of total-----	33	33	8	26	100
1979:					
Value-----billion U.S. dollars----	6.8	6.0	1.6	3.8	18.1
Percent of total-----	37	33	9	21	100
1980:					
Value-----billion U.S. dollars----	10.2	7.1	1.3	4.4	23.0
Percent of total-----	44	31	6	19	100
1981:					
Value-----billion U.S. dollars----	11.3	5.7	1.0	4.0	22.1
Percent of total-----	51	26	5	18	100
1982:					
Value-----billion U.S. dollars----	10.5	4.7	1.0	3.3	19.4
Percent of total-----	54	24	5	17	100
1983:					
Value-----billion U.S. dollars----	8.6	3.5	0.8	2.5	15.4
Percent of total-----	56	23	5	16	100

Source: Desempenho do comercio Exterior Brasileiro, 1983, Fundacao Centro de Estudos do Comercio Exterior, 1984.

spite of such high tariff levels, however, tariff collections in 1983 were equivalent to only 5 percent of the total value of imports, indicating that either most imports are in low tariff categories, or that imports entering Brazil do so under special incentive programs exempting them from tariffs.

In addition to tariffs, Brazil has also added tariff surtaxes of 30 to 100 percent on several thousand categories of imports. The Government recently decided to reduce these (to 10 to 30 percent) and to incorporate the surtaxes into the tariff.

Import license.--Imports are further limited by requiring import licenses for most products. These licenses, issued by the trade department of the Banco do Brasil, CACEX, can be granted only to companies on the CACEX registry of importers and exporters. These companies must comply with a number of other formalities such as providing origin and price information for their imports and proving that they have fulfilled the exchange regulations. Delays in obtaining import licenses can be considerable, and these may limit imports as well.

Annual import programs.--Another way imports were further restricted began in 1980 with a CACEX requirement that major importers (enterprises with over 100,000 dollars' worth of imports a year) limit the value of their firm's imports to a level based on a prior year. In 1981, for example, firms had to limit imports to the previous year's level. As prices had increased, this restriction actually reduced the volume of imports allowed.

Import financing.--Various restrictions have also been placed on the terms of financing for imports. One of these--eliminated in 1979--required that a deposit, equal to the amount of the product imported, be made in a non-interest-bearing account for at least 1 year. With Brazil's high inflation, this raised the cost of imports considerably.

Another import financing regulation is Central Bank resolution 767 of October 7, 1982, requiring import financing to be obtained abroad. The terms of the financing depend on the nature and amount of the import. Three categories of products are distinguished in the resolution, as follows:

- (1) For capital goods, equipment, appliances, instruments, vehicles, ships and planes:

<u>U.S. dollars F.O.B. price</u> <u>or the equivalent</u>	<u>Minimum payment period</u> <u>(Years)</u>
From \$100,000 to \$300,000-----	3
From \$300,000 to \$1 million-----	5
From \$1 million to \$5 million-----	7
Over \$5 million-----	8

- (2) Spare parts, components, and accessories: 1 year;
- (3) Consumer durables, raw materials, and intermediate products for chemical and steel industries when the imports are over \$100,000 per year: 180 days.

This resolution was recently liberalized to allow shorter minimum payback periods.

Local content.--The Brazilian Law of Similar, applied through the import licensing system administered by CACEX, can be used to limit import items that are considered superfluous or luxurious or that are already made in Brazil. Although many exceptions to this policy exist in practice, the Government can be quite strict in applying it. For example, sometimes import licenses have been denied on the grounds that a local producer is capable of making a similar product even though the Brazilian firm may not currently be manufacturing the product. After a period of very tight application of the Law of Similar, the Government of Brazil announced in September 1984 that the law will not be applied to imports receiving overseas financing of more than 1 year.

Government purchasing.--Government purchasing is used to increase the share of domestic value added in selected product areas, as well as to encourage majority Brazilian ownership in certain sectors of the economy. Because of the size of the State-owned enterprises, the practice of making Government purchases contingent upon fulfilling local-content and ownership criteria can have a significant effect in certain targeted sectors.

Table 4 shows the size of the State firms' spending and investment budgets for 1983 and 1984. The table also shows the division of funding among the State-owned companies. In 1983 the dollar equivalent for the total amount was about \$60 billion for both spending and investment budgets combined.

The budget shown in table 4 is developed by the Secretariate for the Control of State-Owned Enterprises (SEST). SEST was established in 1979 as part of the Planning Secretariate to control the level of Government expenditures especially in the State-owned enterprises, whose foreign borrowing and spending were difficult to control previously. The limits set by SEST take into consideration the financial objectives of the Government sector, the size of the expected trade surplus or deficit, the purchasing requirements of the enterprises, and efforts in the sector to bring about changes in local-content and ownership patterns.

The division of spending by enterprise also serves to point out those sectors where Government purchasing influence is strongest. For example, after Siderbras (steel) and Petrobras (oil), the largest budgeted amounts for domestic purchasing were allocated to Telebras and to ELETROBRAS, two large Governmental coordinating authorities in the telephone and electrical utility industries. This spending pattern reflects the Government's desire to develop the domestic communications and heavy electrical equipment industries. In both industries the proportion of domestic value added has increased significantly. In the heavy electrical equipment sector, the proportion of domestic supply is expected to rise from 67 percent in 1978 to 85 percent in 1985. In communications equipment, imports fell from \$315 million in 1975 to \$107 million in 1981. Furthermore, during the early 1980's foreign manufacturers of communications equipment with established operations in Brazil have been forced to take in Brazilian partners as majority shareholders.

Table 4.--Brazil: State Firms' Expenditures and Investments, 1983-84
(billions of cruzeiros)

Firm	Spending			Investments		
	1983	1984	% change	1983	1984	% change
Cobra (Computers)-----	56,282	120,446	114	250	2,204	782
Cobal (Food)-----	341,855	792,935	132	3,757	4,760	27
ECT (Post office)-----	217,496	526,005	142	8,554	20,294	137
Serpro (Data Processing)-----	99,211	243,008	145	3,712	8,834	138
Caraliba (Copper)-----	193,705	537,906	178	30,000	3,421	-89
Maferasa (Railroads)-----	36,425	72,764	100	808	3,333	312
Usimec (Mining)-----	66,194	166,497	152	219	514	135
Codevasf-----	55,843	87,435	57	39,404	51,310	30
DNOCs-----	94,777	91,440	-4	76,844	49,479	36
DNOS-----	59,007	65,211	11	52,425	43,444	-17
Engepron-----	30,501	111,897	267	20	169	745
Itaipu (Hydroelectric Energy)-----	612,752	1,533,893	150	363,874	449,068	54
Fosfertil (Fertilizers)-----	101,330	248,186	145	1,012	2,405	138
Lloydbras (Shipping)-----	178,275	483,106	171	12,043	78,620	553
DNER-----	586,612	1,038,246	77	322,261	482,977	50
EBTU-----	161,408	764,334	374	87	148	70
Embraer (Aerospace)-----	171,073	347,290	103	20,159	48,909	143
Infraero (Airports)-----	289,503	789,309	173	510	760	49
Telebras (Communication)-----	434,471	3,562,821	148	525,691	1,213,294	131
Acesita (Steel)-----	318,145	791,931	149	16,657	40,702	144
CNA-----	51,749	112,887	118	6,975	2,452	-65
Siderbras (Steel)-----	3,126,730	7,556,613	142	418,303	316,838	-24
Eletrobras (Electricity)-----	2,929,874	6,746,827	130	788,101	1,397,677	77
CVRD (Mining)-----	1,082,903	2,530,892	134	352,269	847,933	141
Nuclebras (Nuclear energy)-----	383,147	1,074,135	180	225,017	454,326	102
Petrobras (Oil)-----	9,654,595	28,005,100	190	1,507,573	3,582,939	138
Portobras (Ports)-----	363,301	716,274	97	95,623	134,680	40
RFFSA (Railroads)-----	994,449	2,700,805	172	251,984	577,541	129
Other-----	4,236,497	5,592,009	32	264,281	347,415	31
Total-----	27,928,111	67,410,291	141	5,388,412	10,276,447	91

Exports

Brazil's exports have climbed from \$8 billion in 1973 to \$21.9 billion in 1984. Table 5 shows that during this period the composition of these exports shifted from basic agricultural and mineral exports (coffee, soybean, and iron ore) to industrial products (cars, trucks and parts, steel, chemicals, footwear, and oil derivatives). During the same period, the composition of industrial exports has changed from semimanufactures to manufactured products.

The principals markets for exports in 1983 were the European Community (26 percent), the United States (20 percent), and the member states of the Latin American Integration Association (14 percent). Over one-half of the recent increases in Brazil's exports have gone to the United States (table 6). As table 7 shows, the United States consumes over 20 percent of Brazilian coffee, cocoa, sugar, orange juice, electronic equipment, steel, chemicals, footwear and oil derivatives.

Export promotion.---The Government of Brazil is involved mainly in promoting industrial exports through three programs: BEFIEX, the Credito Premio, and drawback. 1/ Though the benefits of these programs are not deliberately targeted, several industries have received most of the resources. According to a 1983 World Bank study, the main recipients are the transportation industry (receiving about one-half of the resources available), food processing, electrical equipment, and mechanical equipment. 2/

However, because of the overvalued currency and delays in receiving incentive payments (which reduced their value considerably under Brazil's high inflation rate), the above-mentioned World Bank study concluded that the real level of export incentives in Brazil was much lower than the nominal level. Whereas the average nominal rate of incentives to export was over 20 percent of the export value of the product in 1980, the World Bank found the real adjusted rate was 3.5 percent. 3/ Brazil no longer maintains an overvalued exchange rate, and so some of the conditions that reduced the nominal value of Brazil's export incentives do not exist today. However, the level of incentives has also been reduced, especially the Credito Premio discussed below.

The Commission for the Granting of Fiscal Benefits for Special Export Programs.---The BEFIEX program was established in 1972 by the Brazilian Government to promote exports. One of the main objectives of the BEFIEX program is "to make use of the potentialities of selected industries in the foreign market according to priorities set by the government's economic policies." The program offers a package of tax benefits to foreign companies investing in Brazil. In exchange for the tax benefits, the companies and BEFIEX negotiate an agreement covering the export commitment of the company, the level of imports, additional investments to be made by the company, and the net foreign exchange earnings for Brazil (i.e. the amount left over after imports, profit remittances, etc.).

1/ A nontransferable export license must be obtained from CACEX for all products except coffee. Furthermore, CACEX must approve the firm's expenses for freight, insurance, and the agent's commission.

2/ The World Bank, Brazil: Industrial Policies and Manufactured Exports, 1983, p. 210.

3/ The World Bank, op. cit., pp. 82-87.

Table 5.--Brazil: Exports by whether basic or industrial products, 1974-1983

Product Type	1974		1977		1980		1983	
	Value	Percent	Value	Percent	Value	Percent	Value	Percent
Basic product-----	4,576	58	6,958	57	8,470	42	8,516	39
Industrial product-----	3,179	40	4,883	40	11,376	57	13,075	60
Semi-manufacturer-----	917	11	1,044	9	2,348	12	1,786	8
Manufacture-----	2,262	29	3,839	31	9,028	45	11,289	52
Other-----	194	3	278	3	285	1	306	1
Total exports-----	7,949	100	12,119	100	20,131	100	21,897	100

Source: Desempenho do Comercio Exterior Brasileiro, Fundacao Centro de Estudos do Comercio Exterior, 1983.

Table 6.--Brazil: Shares of export growth 1976-84

(In percent)			
	1976-81	1982 and 1983	January-April 1984
Other LDC's-----	26	8	15
Latin America-----	24	-158	6
European Community-----	22	-18	16
United States-----	17	68	59
U.S.S.R. & Eastern Europe-----	6	-18	-6
Japan-----	4	15	5
All other-----	1	3	5

Source: CACEX, Banco do Brasil.

Table 7.--Brazil: Major exports and U.S. share 1982 and 1983

Products	Exports		U.S. share	
	1982	1983	1982	1983
	Million U.S. dollars		Percent	
Primary products:				
Coffee-----	2,113	2,325	32	29
Soyabeans-----	2,122	2,564	0	0
Cocoa-----	427	552	25	20
Sugar-----	580	515	15	23
Orange juice-----	575	609	52	44
Meat-----	814	805	-	-
Iron ore and other ores-----	2,001	1,682	3	3
Tobacco in leaf-----	3,195	2,870	2	6
Manufactured products:				
Transportation equipment & components-----	2,085	1,920	4	4
Machines and mechanical instruments-----	824	646	33	60
Machines, electronic equipment-----	404	448	33	41
Manufactured steel products--	1,064	2,134	29	19
Chemical products-----	897	1,191	12	21
Wood-----	274	321	10	11
Footwear and leather products-----	733	811	50	68
Oil derivatives-----	1,149	1,163	34	46

Source: Brazil Economic Program; Internal & External Adjustment, Bank of Brazil, 1984 and U.S. Department of Commerce.

A summary of the BEFIEX commitments signed between 1981 and 1983 is presented in table 8. According to this table, 147 contracts have been signed committing companies to export \$45 billion of manufactured products. The largest single recipient of BEFIEX subsidies has been the automobile industry. Together with auto parts makers, automobile manufacturers have committed themselves to export about 35 percent of the total BEFIEX export commitment.

Among the special incentives granted by BEFIEX are the following:

--A 70 to 80 percent duty and tax reduction on imports of equipment and machinery. These tax reductions can be authorized even when a "national similar" exists. However, if there is a "national similar" imports are subject to prior approval by the Ministry of Industry and Commerce in case of machinery, equipment and components, and by the Council of Customs Policy in the case of imports of intermediate products. In special cases the President of Brazil can grant a greater tax reduction if the project is considered of special national importance.

--A 50 percent duty and tax reduction on imports of raw materials, components and intermediate product imports, up to a total import value of one third of the average net FOB value of exports. In special cases, considered to be of national interest, complete exemption from duties and taxes can be granted.

--Maintenance of fiscal export incentives during the entire period of validity of the export programs, even if changes occur in the legislation of incentives. This point has become especially important since the fiscal credits were first abolished in 1979 and then re-introduced with a timetable to be eliminated by 1985. These changes have not affected the fiscal credits granted to enterprises joining the BEFIEX program before March 30, 1982.

Exemption from payment of corporate profit tax on exports and from taxes on remittance of profits. Preoperational and preindustrial costs can be carried forward for tax computations for a term of up to 10 years.

Table 8.--Brazil: BEFIEX program by industry, 1981-1983

Industry	Number of agreements	Export agreement	Imports of			Net foreign exchange earning
			machines and equipment	parts and materials	exchange	
-----In millions of U.S. dollars-----						
Automotive	13	13,605	1,027	3,260	6,924	
Auto parts	12	2,149	99	289	1,457	
Capital goods	24	7,732	211	1,217	4,536	
Footwear	15	1,653	25	45	1,300	
Elec. appliances	9	3,667	130	561	2,336	
Non-ferrous metal	2	3,828	163	43	3,679	
Rubber	2	2,080	120	592	207	
Textiles	16	1,474	118	132	1,104	
Chemicals	4	642	9	89	310	
Paper and paper products	3	139	11	24	107	
Tractors	7	2,174	19	476	1,403	
Other	40	6,010	307	523	4,592	
Total	147	45,153	2,239	7,251	27,955	

Source: BEFIEX.

If the company fails to meet the BEFIEX approved export program's goals, the company will have to pay the exempted taxes (adjusted for inflation) and a fine of up to 50 percent of their value.

Since 1977, a similar CIEX program has been operated by BEFIEX for small enterprises reluctant to make long-term export commitments. Under CIEX, import duties and taxes are reduced for machinery and equipment by up to 90 percent. An export agreement usually lasts for 5 years, and the export targets compared with the import volume are lower than in the BEFIEX program. The CIEX program is only about 10 percent of size of the BEFIEX program.

Credito Premio.--The Credito Premio is an export subsidy that provides exporters with a cash grant equal to a share of the value of their exports. The subsidy was first introduced in 1968 but was abolished following the maxidevaluation of December 1979. Abolishing the subsidy in 1979 was consistent with Brazil's obligations as a signatory to the GATT Agreement on Subsidies and Countervailing Duties. However the Credito Premio was reintroduced in April 1981 with a plan to phase out the program by 1983. 1/ This plan was subsequently altered with the credito premio now scheduled to be phased out in 1985. 2/

Before the 1979 devaluation, the level of the credito premio was based on the tax level of the IPI value-added tax. The level of the IPI tax varies, depending upon the product under consideration, and so some exports received greater tax grants than others. When it was reinstituted in 1981, the new Credito Premio was set at a flat 15 percent for all products. The level has been gradually decreased since then and will continue to drop, according to the Government's plan, until May 1, 1985, when it will be phased out entirely.

Duty-drawback system.--The duty-drawback system allows the Brazilian authorities to suspend or reimburse import duties and other taxes on certain imports. To qualify, the import must be used in the manufacturing of a product for export. The program is run by the Bank of Brazil's CACEX.

Foreign Investment

Brazilian foreign investment policy encourages foreign equity investment that can contribute to domestic industry development and to a more favorable balance of payments. Reflecting this broad and relatively open policy, the basic Brazilian statutes governing foreign investment (Law 4131 of Sept. 3, 1962, and Law 4390 of Aug. 29, 1964) grant foreign investments essentially the same treatment as domestic capital. Furthermore, many of the

1/ In 1981, when the Credito Premio was reintroduced until 1983, the United States still considered Brazil "a country under the agreement" (i.e., the Agreement on Subsidies and Countervailing Duties), because the new timetable was roughly consistent with the original timetable agreed to during the MTN. However, extending the life of the Credito Premio until 1985 required further negotiations with the United States.

2/ This provision does not apply to tax credits granted to specific firms under the BEFIEX program. These BEFIEX credits could not be modified, because they had been granted under the condition that they would remain in force during the entire period of validity of the firms' export commitments.

import, financial, and tax incentives available to domestic investors are also available to foreign investors. Nonetheless, certain markets are restricted to foreign capital, and others are closely regulated.

With its relatively receptive foreign direct investment policy and its position as one of the largest and wealthiest markets among the LDC's, Brazil has been able to attract extensive amounts of foreign capital. Table 1 shows which industries have received large amounts of foreign investment. Table 9 shows the total stock of foreign direct investment in 1983 in various sectors and the proportion of this stock owned by U.S. companies. In general, the main receiving industries involve import substitution, export expansion, and capital goods manufacturing. The largest single source of foreign investment--30 percent in 1980--has been the United States.

Directing investors.--In most industrial sectors, foreign investment does not require prior government approval. ^{1/} Nonetheless, the Government maintains some control over foreign investment by awarding investment incentives. These investment incentives include exemption from import duties, exemption from certain value-added taxes, depreciation for income tax purposes at three times the normal rates, and subsidized Government financing.

Because local firms receive investment incentives from the Government and because the currency has been historically overvalued, foreign investment incentives are needed to help attract capital from overseas. Through its incentive system, the government is able to influence the size, location, and nature of the foreign investment. The Brazilian Government prefers joint ventures with Brazilian majority ownership and investments that use current technology, increase Brazil's exports, and create employment, in the less developed regions of the country. The Government also prefers equity investments over loans.

Another major source of Government control comes from requiring that capital investments be registered for remitting profits. Unless a foreign investment is registered, the investor cannot legally repatriate profits or remit dividends, although the investor may still receive the investment's return if it is kept in Brazil.

Restricting investors.--Under a market reserve policy, Brazil restricts the production and sales rights for certain products to "national" firms. In some cases, such as informatics, market reserve works by prohibiting foreign investment in certain areas of the market, by imposing strict import controls, and by using tax and capital incentives to entice local investors.

In addition to restricting certain areas for nationalistic or security reasons, foreign participation in some sectors is limited by the extensive degree of State ownership. The State has a monopoly in infrastructure development areas, such as oil refining, communications, transportation, hydroelectric power, and nuclear power. The State also has a dominant role in steel, mining, aircraft manufacturing, and basic petrochemicals.

^{1/} However, in a few sectors--petroleum, computers, process control equipment and semiconductors--prior approval is specifically required.

Table 9.--Brazil: Value of total foreign and U.S. direct investment in Brazil, by industries, 1983

Industry	Total value	U.S. value
Agriculture-----Million dollars--:	134.2 :	51.7
Livestock-----do-----:	64.6 :	.8
Fishing-----do-----:	1.6 :	.1
Mining-----do-----:	624.4 :	339.7
Steel-----do-----:	465.6 :	18.1
Metallurgy-----do-----:	1,168.8 :	260.6
Electronic/Communication -----do-----:	2,083.5 :	835.8
Automotive vehicles-----do-----:	2,149.0 :	439.8
Automotive parts-----do-----:	516.3 :	128.1
Chemicals-----do-----:	2,220.2 :	922.0
Petroleum Derivatives-----do-----:	468.5 :	144.3
Pharmaceutical-----do-----:	930.3 :	355.6
Electronic/Communication -----do-----:	358.9 :	48.8
Automotive vehicles-----do-----:	964.0 :	314.3
Automotive parts-----do-----:	205.5 :	145.2
Chemicals-----do-----:	252.7 :	938.0
Petroleum Derivatives-----do-----:	45.7 :	11.0
Pharmaceutical-----do-----:	706.3 :	200.3
Petroleum Derivatives-----do-----:	2,383.4 :	665.1
Pharmaceutical-----do-----:	401.1 :	67.3
Total-----:	21,831.4 :	6,950.0
Percent of total-----:	100.0 :	31.83

Source: Banco Central do Brasil, Boletim Mensal, November 1983.

Tax Policy

Important taxes in Brazil are income taxes, several value-added taxes, a special financial operations tax, and import tariffs. How these taxes contribute to Brazilian Federal Government income is shown in table 10.

Tax incentives and disincentives are used to promote the use of domestically-made products by encouraging exports and reducing imports. Some of the main uses of tax incentives and disincentives are described below.

Export incentives

Income tax rebates.--The profit on approved export sales is exempt from income tax. In addition, related expenses incurred abroad for promotion, advertising, participation in trade fairs and expositions, as well as for maintaining foreign offices, are deductible. Approved products are manufactured goods chosen by the Ministry of Finance and intended for penetration into the international market.

Table 10.--Brazil: Principal Federal Government Tax Revenues, 1982 and 1983

Item	: 1982	: Percent:	1983	: Percent
	: <u>Billion</u>	: of total:	: <u>Billion</u>	: of total
	: <u>cruzeiros</u>		: <u>cruzeiros</u>	
Total Gov. Revenues-----	4,617,900	100	11,355,500	100
Tax Revenues-----	3,604,400	78.0	7,788,000	68.6
Import tax-----	229,800	5.0	477,800	4.2
Export tax-----	6,900	0.2	186,200	1.7
Income tax-----	1,354,500	29.3	3,494,200	30.8
Industrialized Products				
Tax-----	489,800	21.4	1,896,600	16.7
Financial Operations Tax-----	556,800	12.1	787,400	7.0
Tax on Fuels and				
Lubricants-----	110,300	2.4	190,900	1.7
Electrical Energy Tax-----	128,100	2.8	273,600	2.4
All other-----	228,200	5.9	481,300	4.2

Source: Brazilian Statistical Survey.

Industrial Product Tax (IPI) rebate.--This value-added tax is levied by the Federal Government on national and foreign goods. The amount charged for each product varies considerably from 0 percent, for essential products, to over 366 percent for cigarettes. When manufacturers can present an export voucher from the Bank of Brazil, they receive a tax credit for the IPI paid.

Tax on the circulation of goods (ICM) rebate.--The ICM tax is a value-added tax levied by the States. Unlike the IPI, the ICM is levied at a flat rate. Exemption from the ICM tax is usually granted only for exports of manufactured goods. Exports of agricultural produce and other nonmanufacturing items are taxed.

Taxes to conserve foreign exchange

Tax on financial transactions (IOF).--The IOF tax applies to foreign exchange purchased for importing purposes. In 1980, the level of this tax increased from 15 percent of the value of the foreign exchange to 25 percent, making the import cost considerably more expensive for the products affected by this requirement (about one-half of all imports). Export finance, export-credit insurance, and exchange-rate operations related to exports are all exempted from the IOF.

Tax on earnings remittances.--Foreign investors that have registered their investment with the Central Bank may remit earnings each year, free of border taxation, up to 12 percent of their average registered investment capital over the prior 3 years. If a company wishes to remit 12 to 15 percent, it must pay 40 percent tax on the portion above 12 percent; from 15 to 25 percent it must pay 50 percent; to remit above 25 percent the tax rate is 60 percent. This scale has encouraged most foreign investors to limit remittances to 12 percent or less of registered capital.

Tax incentives for the purchase of Brazilian-made equipment

Accelerated depreciation for capital goods manufactured in Brazil.--Decree Law 1137 allows a company that purchases Brazilian-made capital equipment as part of expansion projects approved by the CDI to depreciate eligible equipment at twice the rate normally permitted under tax laws. Although this tax program was stopped in 1979, expansion projects approved before 1979 may still use this benefit.

Incentives for local machinery and equipment suppliers.--The tax incentives granted to exporters of manufactured goods are extended to national producers of machinery and equipment participating in tenders of international financial institutions (such as the World Bank and the Inter-American Development Bank) for sale on the local market. These incentives are extended also to suppliers of equipment for public works that are financed from abroad.

Income tax reductions to promote favored investments

Corporate income tax payers may invest up to 26 percent of their basic income tax liabilities in special Government development projects for the underdeveloped northern and northeastern regions of Brazil or in approved reforestation, fishing, or tourism projects. The amounts invested in this way are credited against the amounts owned the treasury.

In a similar program, 1 percent of a company's tax liability may be invested in the Government-controlled aircraft company, EMBRAER. The Government of Brazil is currently considering a similar 1 percent tax credit program for investments in the domestically owned computer industry.

Financial System

The basis of the Brazilian banking system is the four main Federal banks: the Central Bank (BACEN), the Banco do Brasil (BB), the National Economic and Social Development Bank (BNDES), and the National Housing Bank (BNH). BACEN, BNDES, and BNH pass on funds to commercial and investment banks for lending to final customers. Both BNDES and BNH also lend directly to final users. In addition, 15 State and Regional Development Banks receive funds from BACEN, BNDES, and BNH for medium- and long-term credit to final users.

The Banco do Brasil is the largest commercial bank in Brazil (with 17 percent of all cash deposits) and the main bank for the lending operations of the Government. Its activities are directed primarily to agriculture, exports, and energy. BB receives its funds from deposits, rediscounts, and its current account with BACEN. Of particular importance to trade is BB's foreign trade department, CACEX.

The banking system also contains 81 private commercial banks, 38 investment banks, and 21 State-owned banks. These concentrate primarily in the area of short-term credit, but the investment banks also underwrite corporate debt and equity. The relative sizes of the various types of banks, as measured by their loans to the private sector are shown in table 11.

National Bank for Economic and Social Development (BNDES)

Table 11.--Brazil: Distribution of loans to the private sector, by final lenders, 1979-81

(In percent)				
	1979	1980	1981	
Banco do Brasil-----	20.9	20.3	16.4	
Commercial Banks-----	29.3	29.1	28.8	
Financial Institutions-----	6.9	5.5	4.7	
Investment Banks-----	10.6	10.2	11.2	
BNH (Housing)-----	2.4	3.0	3.7	
Credit Unions-----	6.9	7.8	8.7	
BNDES-----	6.8	6.5	6.8	
State Development Banks-----	3.2	3.4	3.5	
Other-----	13.0	14.2	16.2	
Total-----	100.0	100.0	100.0	
Public Institutions-----	55.9	56.7	55.3	
Private Trust-----	44.1	43.3	44.7	

Source: Bank of Brazil, Boletim Mensual.

The BNDES system is the chief financial agent for the Brazilian Government's industrial investment policy. The system consists of three major branches--BNDES, FINAME, and BNDESPAR. Commitments by all three in 1983 totaled \$3.6 billion, about one-quarter of which went to steel and nonferrous metal investments.

The three basic objectives of the system are to promote economic and social development, to reduce regional income differences, and to strengthen Brazilian-owned private companies. In spite of its emphasis on the private sector, the BNDES system is also a major supporter of investments in some State-owned enterprises.

Most BNDES resources come from compulsory savings funds and from foreign loans. In 1982, BNDES was given the responsibility of financing social investments in food, low-cost housing, health, education, and small-scale agricultural projects, to be financed principally with 0.5 percent tax on the gross sales of public and private enterprises.

BNDES.--The largest part of the BNDES System is the direct lending activity of BNDES, which accounts for over half of all system disbursements in 1983. Most of these funds went to large companies, and as table 12 shows, these were in the steel, electricity and infrastructure sectors. Small companies receive indirect loans from BNDES either through state development banks or other private banks. All companies receiving BNDES loans must be majority owned by Brazilian nationals.

Direct and indirect loans from BNDES are usually for a ten year period and usually carry an interest rate that is set at 12 percent above the rate of inflation. (The interest rate varies somewhat depending upon the recipient.) Loans disbursed to small and medium sized companies from a World Bank program

Table 12.--Brazil: BNDES system financing, 1982 and 1983

Sectors	1983				1982			
	BNDES		FINAME	BNDESPAR	Total	Total	Total	Total
	Direct	Indirect						
Heavy Industry-----	519,421	20,781	109,687	152,225	802,113	802,113	372,181	372,181
Mining-----	18,035	824	14,163	4,000	37,021	37,021	27,921	27,921
Steel-----	374,887	3,858	47,358	30,202	456,304	456,304	206,600	206,600
Non-Ferrous Metals-----	37,680	371	9,780	66,097	113,929	113,929	50,969	50,969
Chemicals & Petrochemicals-----	23,005	11,336	19,153	23,264	76,758	76,758	36,703	36,703
Paper-----	49,057	4,315	13,734	28,338	95,444	95,444	34,526	34,526
Cement-----	16,757	78	5,479	-	22,314	22,314	15,122	15,122
Others-----	-	-	20	324	343	343	338	338
Capital Goods-----	61,663	9,251	8,063	20,580	99,558	99,558	17,505	17,505
Mechanical-----	45,731	4,518	5,391	8,727	64,367	64,367	10,809	10,809
Electronics-----	468	3,610	1,054	6,589	11,722	11,722	4,344	4,344
Transport-----	2,107	1,018	1,610	4,987	9,722	9,722	2,152	2,152
Others-----	13,357	105	8	277	13,747	13,747	201	201
Consumer Goods-----	3,844	32,944	9,600	19,014	65,401	65,401	19,710	19,710
Civil Engineering-----	1,381	5,524	9,990	10,167	27,062	27,062	7,472	7,472
Other Industrial-----	-	6,437	13,560	1,565	21,563	21,563	7,794	7,794
Agriculture-----	80,774	31,378	31,237	12,995	156,385	156,385	51,764	51,764
Fertilizers-----	10,292	493	900	6,000	17,685	17,685	4,009	4,009
Agricultural Products-----	0	1,051	3,561	766	5,378	5,378	1,552	1,552
Agroindustries-----	276	27,979	22,535	5,630	56,421	56,421	14,958	14,958
Agricultural Machines & Implements-----	4,716	1,108	273	599	6,695	6,695	1,564	1,564
Rural Infrastructure-----	65,490	747	3,014	-	69,252	69,252	29,670	29,670
Others-----	-	-	954	-	954	954	11	11
Energy-----	298,103	24,896	110,993	8,427	442,419	442,419	156,804	156,804
Petroleum & Natural Gas-----	702	-	226	2,491	3,419	3,419	24	24
Coal-----	1,471	254	729	4,214	6,668	6,668	781	781
Electricity-----	259,824	-	106,386	-	366,210	366,210	123,151	123,151
Nuclear-----	-	-	3,016	-	3,016	3,016	1,932	1,932
Alcohol-----	28,665	24,642	636	1,722	55,665	55,665	30,916	30,916
Others-----	7,441	-	-	-	7,441	7,441	-	-
Infrastructure-----	117,951	2,090	81,153	993	202,188	202,188	93,951	93,951
Urban-----	31,155	16	48,454	-	79,625	79,625	44,970	44,970
Industrial-----	652	-	-	-	652	652	1,246	1,246
Communication-----	-	18	373	-	391	391	352	352
Transportation-----	85,908	2,056	32,327	993	121,284	121,284	47,383	47,383
Others-----	236	-	-	-	236	236	-	-
Social-----	333,311	4,900	-	-	338,211	338,211	37,374	37,374
Other Programs-----	33,670	28,756	14,895	4,775	82,094	82,094	15,654	15,654
Total-----	1,450,118	166,957	389,178	230,741	2,236,994	2,236,994	780,196	780,196

Source: Relatório de Atividades 1983, Sistema BNDES, 1984.

administered by BNDES carry an interest rate that is set at roughly 6 percent above the rate of inflation. Compared with the current market rate for short- and medium-term loans of approximately 40 percent above the rate of inflation, these BNDES rates appear to be heavily subsidized.

Special Agency for Industrial Financing (FINAME).--FINAME specializes in financing the purchase of industrial production equipment. The equipment financed must have a high domestic-made content, usually around 80 percent. In spite of the emphasis on high local value added, foreign-owned companies are equally eligible for FINAME financing as long as they are registered to supply equipment in a particular sector. Table 12 shows that the major recipients of FINAME financing were steel, electricity, and infrastructure. Most FINAME loans last for 18 to 36 months and carry an interest rate 6 to 12 percent above the rate of inflation.

BNDES Participations, S.A., (BNDESPAR).--BNDESPAR purchases stock for minority ownership of Brazilian-owned companies. In late 1983, BNDESPAR's portfolio included shares from more than 200 companies for a total investment of over \$1 billion. Table 12 shows that the main recipients of BNDESPAR investments were nonferrous metals, chemicals, steel, and paper industries.

Export financing

The amount of funding available for export-related financing has fallen considerably in the last two years. In 1982, the Government of Brazil provided about \$5 billion to industry for export credits under the various programs outlined below, and in 1983, this amount fell to an estimated \$3 billion. In 1984, \$3.7 billion was budgeted, although, according to Brazilian Government officials, many of the budget allocations are not being fulfilled.

FINEX (Resolution 509 of the Central Bank) and Resolution 68 of CACEX.--CACEX through an export financing fund (FINEX) in the Central Bank provides post-shipment, U.S. dollar financing either directly through the Banco do Brasil or indirectly through private banks. The terms of the lending are supposed to be equivalent to that provided by other countries' export financing banks. Usually the loans last for 1 to 8 years, require a down payment of 15 percent, and carry an interest rate of 9 percent.

In 1984, approximately \$2.7 billion was budgeted for FINEX. Capital goods receive most of this financing. FINEX also funds overseas promotional and marketing activities, including defraying some of the costs of advertising, participation in trade fairs, and foreign market research.

Resolution 643 and 674 (since January 1984, Resolution 882 and 883).--This program is administered by the Banco do Brasil and, until 1982, was the most important program for providing preexport working capital to exporters and trading companies. In 1982, about half of Brazil's exports received some funding from Resolutions 643 and 674. Traditionally, footwear and textile manufacturers have relied heavily on this source for financing their working capital needs.

Eligibility is determined on the basis of past exports or an acceptable export plan, and the amount of financing is based on the dollar value of exports. Following CACEX approval of an application, a participant in the program receives certificates representing portions of the total approved amount. The certificates may be presented to banks in return for cruzeiros at the exchange rate in effect on the date of presentation. The certificates must be used within 12 months of the date of issue and loans incurred must be repaid within 18 months.

In 1984, many changes have taken place in the terms of loans available under these programs. In January 1984, the amount of funds available under these provisions was reduced considerably and eliminated completely for some sectors (such as frozen concentrate orange juice). The interest rate was also changed, with new loans bearing a real interest rate (the interest rate after correcting for inflation) of 3 percent. In August 1984, the interest rate was changed again. Under the newest system, exporters arrange credit through a commercial bank at the "free market rate." The Government then grants a direct interest rate subsidy to make the rate equal to the rate of inflation plus 10 percent. (At the time of the change, the free-market rate was 25 to 40 percent above the rate of inflation.)

PROEX and PROSIM.--These are two recently established programs administered by BNDES since February 1983. They lent no money in 1983 and are not expected to lend their full 1984 budgeted amount of \$100 million in 1984. PROEX is supposed to provide working capital for Brazilian investors who meet specific biannual export expansion goals. PROSIM is supposed to provide investment capital to operations designed to produce substitutes for imports. Firms receiving PROEX and PROSIM loans have 5 years to repay the loan with a 2-year grace period. The interest rate is 10 percent above the rate of inflation.

Council of Industrial Development (CDI)

The CDI is one of the principal agencies used by the Government to control investments. This agency has the responsibility of awarding tax incentives and tax exemptions on imported products and equipment, and of facilitating financing arrangements to approved industries. Unlike BEFIEX, most CDI incentives do not require an export agreement and they usually are directed to Brazilian-owned firms. Furthermore, CDI usually requires a high percentage (80-90 percent) of local content. Moreover, the agency insists that projects result in a net favorable balance of exports over imports. The CDI incentive package can include (1) reduced import duties, (2) reduced border taxes on imports, (3) a waiver of prior deposit on imports, (4) access to official subsidized credits, (5) exemption from certain value-added taxes (IPI and ICM) for the purchase of domestically produced capital goods, and (6) allowance of accelerated depreciation for income tax purposes for the use of domestic capital equipment.

The CDI incentives program was greatly reduced in 1979 in an effort to raise Government revenues. As table 13 shows, in 1983, 80 percent of CDI-approved investments were in basic and intermediate metal products and chemicals, petrochemicals and pharmaceuticals. Fiscal incentives awarded by CDI were limited completely to these two sectors.

Table 13.--Brazil: Number of projects approved for CDI investment incentives, project investment, and fiscal incentives awarded, 1983

Sector	Number of projects	Investment	Fiscal incentives	
			Tariff reduction	CPI tax reduction
			CR\$1,000	
Capital goods-----	2	1,145,703	-	-
Basic and intermediate metal products-----	6	201,885,720	-	-
Chemicals, petrochemicals and pharmaceuticals-----	14	89,571,765	66,062	111,982
Nonmetal intermediate pro- ducts, and cement and paper--	5	25,034,437	5,200,516	-
Automobiles & components-----	4	14,652,118	-	-
Consumer goods-----	47	34,303,567	-	-
Total-----	78	366,593,310	5,266,578	111,982

Source: Conselho de Desenvolvimento Industrial, Annual Report, 1983.

Science and Technology Policy

Brazil has a long history of promoting domestic technological development. The State has financially contributed to a number of institutes for training engineers and scientists and for carrying out technological research. Also, through official policies and laws, the State has regulated the level and type of technology imports. In addition, the Government has established a number of policies to promote the use of more modern technology at the firm level.

Training and institutes

Before 1968, most of the Government's efforts in the science and technology area were devoted to creating various research and development centers in engineering and the sciences. Among these are the National Institute of Technology founded in 1921, the Aerospace Research Center begun in 1954 and several State-level centers. Since the early 1950's, efforts were also made to establish coordinating agencies to plan, promote, and finance work in this area. In 1951, for example, the National Research Council (CNPq) and the Campaign for the Improvement of the Higher Educational Staff (Capes) were established. To help finance these efforts the Government established a special fund, FUNTEC, within the National Bank of Economic Development (BNDES) and the Fund for Financing Studies and Projects (FINEP) in the Ministry of Planning. This latter was to finance feasibility studies and project development for investments.

In 1968, science and technology became an official high-level Government objective. For the first time, the National Development Plan defined an explicit policy for S&T and set up two agencies to carry out the policy. One agency was the National System of Scientific and Technological Development (SNDCT), which coordinates all Government action in the S&T field. The second agency, the National Fund for Scientific and Technological Development (FNDCT), was created to fund the projects of SNDCT.

The SNDCT has developed three sets of plans. The first, for the period 1973-76, promoted an increase in the volume of resources for science and technology research. The second, 1975-79, aimed at broadening the supply of S&T and at reinforcing the technological capabilities of national firms. The third, 1980-85, set up policy directions for the public and private sector.

Table 14 shows the level of FNDCT funding and the main areas of expenditure during the 1970's. By far the largest amount of money has gone to the development of human resources and research. Over half of these funds were used to support basic research at universities and graduate schools.

Because no one source of information is available, estimating the total amount spent on S&T in Brazil is difficult. However, table 15 shows amounts spent by the three main funds, the FNDCT, CNPq, and FUNTEC/BNDE. As can be seen, the level of official support of these three funds increased dramatically in the 1970's, reaching over \$650 million in 1978. According to one estimate, if spending by autonomous state enterprises, independent research institutes, and private industry is also included, approximately 1 percent of GNP was spent on S&T in Brazil in the late 1970's. ^{1/}

The growth of Government spending on S&T halted in 1983 when cutbacks were imposed on almost all Government expenditures. In 1984, total Federal budget S&T expenditures are expected to be about 68 percent of GNP. The main areas to receive this funding are energy (29.6 percent), agriculture (22.7 percent), basic science (13.0 percent) and environmental and natural resources (7 percent).

Regulating technology imports

Since a 1962 law, the State has been deeply involved in controlling the import of technology by requiring that all payments for technology transfer be registered with the Central Bank, including contracts for technical assistance, engineering services, trademark licenses, and licenses for fabrication and project preparation. In 1971, this function was moved from the Central Bank to the National Institute of Industrial Property Rights (INPI). INPI makes certain that all registered agreements conform with Brazilian regulations relating to the terms and payments, period of validity, required Brazilian participation, and various other special provisions depending on the type of contract.

^{1/} World Bank, Brazil: Industrial Policy and Manufactured Exports, 1983.

Table 14.--Brazil: FNDCT financing 1970-1979 1/

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979 1/	Total
	(Cr\$ thousands at 1978 prices 2/)										
<u>Development of New Technologies</u> (Nuclear Energy, Space, Ocean Resources, Non-Conventional Energy)	4,172 (1)	6,605 (1)	28,709 (1)	348,633 (7)	117,810 (3)	1,230,208 (15)	359,766 (10)	186,438 (8)	899,600 (13)	41,837 (10)	3,181,041 (66)
<u>Infrastructure Technology</u> (Electric Energy, Petroleum Transport and Communications)	9,394 (1)	5,713 (1)	18,092 (1)	69,249 (2)	2,499 (1)	417,712 (3)	205,706 (2)		227,027 (8)	42,946 (1)	908,338 (20)
<u>Industrial Technology</u>	5,364 (1)	31,730 (2)	304,043 (5)	218,750 (7)	266,904 (7)	179,508 (7)	184,048 (8)	367,781 (7)	1,172,784 (15)	94,149 (6)	2,825,161 (65)
<u>Agricultural Development</u>		24,160 (1)			121,891 (3)	11,480 (2)	172,309 (4)	70,497 (3)	318,986 (14)	1,299 (1)	720,622 (29)
<u>Technology Applied to Regional and Social Development</u>		5,107 (1)	14,548 (1)	112,822 (4)	231,004 (5)	139,020 (4)	240,946 (7)	119,180 (9)	571,870 (11)	17,540 (3)	1,452,037 (45)
<u>Scientific Development and Creation of Human Resources for Research</u>	34,158 (5)	214,490 (18)	819,892 (17)	1,029,794 (22)	936,964 (29)	1,679,227 (35)	1,380,690 (40)	1,518,453 (49)	1,562,002 (69)	958,925 (20)	10,134,505 (304)
<u>Support Activities for Scientific and Technological Development</u>		40,235 (2)	26,450 (1)	108,108 (2)	41,798 (3)	15,820 (2)	85,437 (6)	35,236 (4)	436,301 (11)	97,587 (6)	929,170 (37)
<u>Total</u>	53,089 (8)	328,039 (27)	1,211,733 (26)	1,887,357 (44)	1,718,869 (51)	3,672,975 (68)	2,628,953 (77)	2,297,585 (80)	5,188,570 (141)	1,254,733 (47)	20,241,003 (566)

1/ Excludes Cr. 1,341 million applied in Special Programs in 160 operations.

2/ Figures in parenthesis refer to number of operations.

Source: World Bank, Brazil: Industrial Policy and Manufactured Exports, p. 225.

Table 15.--Brazil: Financing by CNP_q, FUNTEC/BNDE, FINEP/FNDCT, 1964-79

	: CNP funds : Funtec/BNDE : Finep & FNDCT:				
	: for grants and: value of : Value of :		Total		Total 3/
	: scholarships : operations : operations :				
	: 1/ 2/ : approved 2/ : approved 2/ :				
	-----1,000 cruzeiros-----				1,000 U.S.
					dollars
1964-----:	28,511 :	2,407 :	- :	30,918 :	1,711
1965-----:	69,084 :	25,500 :	- :	125,502 :	6,945
1966-----:	34,627 :	42,208 :	- :	81,835 :	4,528
1967-----:	89,023 :	265,944 :	83,118 :	519,920 :	28,773
1968-----:	82,270 :	571,442 :	234,454 :	888,166 :	49,151
1969-----:	131,116 :	117,910 :	7,187 :	320,897 :	17,759
1970-----:	202,039 :	577,239 :	150,524 :	929,802 :	51,456
1971-----:	169,356 :	706,944 :	484,769 :	1,361,069 :	75,322
1972-----:	217,036 :	300,777 :	1,458,776 :	1,976,589 :	109,385
1973-----:	242,992 :	780,298 :	2,936,910 :	3,960,200 :	219,159
1974-----:	219,082 :	635,261 :	2,753,423 :	3,607,766 :	199,655
1975-----:	245,212 :	616,681 :	7,161,849 :	8,023,742 :	444,037
1976-----:	387,507 :	430,805 :	4,683,593 :	5,501,905 :	304,477
1977-----:	512,106 :	192,941 :	4,656,593 :	5,361,980 :	296,734
1978-----:	604,167 :	134,867 :	11,069,982 :	11,809,016 :	653,515
1979-----:	712,693 :	71,669 :	3,739,934 :	4,524,296 :	250,376

1/ This does not represent the total budget of the CNP_q including its own research activities but only the amount spent on grants and scholarships.

2/ Thousands of cruzeiros at 1978 prices.

3/ Converted at 1978 average exchange rate of Cr. 18.077/US\$.

Because payments between related parties are not allowed under Brazilian law, the level of registered technology transfer payments is relatively low. In 1983, for example, INPI approved technology imports totaling \$218 million. Approximately 80 percent of this amount was for engineering services. The following shows the amounts paid for technology transfer during 1979-83.

<u>Year</u>	<u>Amount</u>
	(million U.S. dollars)
1980-----	321
1981-----	276
1982-----	240
1983-----	218

Promoting technology at the firm level

The principal institution for promoting the use of technology at the firm level has been the Fund for Financing Studies and Projects. FINEP has three separate programs. The largest supports users of consulting services by providing financial assistance to public or private firms for all types of project studies controlled by Brazilian residents.

The second largest program supports the technological development of national enterprises. This program gives priority to firms operating in areas considered fundamental for the National Development Plans and only applies to firms controlled by Brazilians. The main activities financed through this program are R&D for new products and processes, research to adapt imported technologies, purchase and absorption of imported technological packages, strengthening of local teams dedicated to the development or adaption of technology, establishment of quality-control centers, and establishment of R&D centers. FINEP also participates in the establishment of firms dedicated to the development and commercialization of products or processes with a high-technology content, and in implementing innovations for adaptations of preexisting technologies.

The third and smallest program of FINEP is to support local consulting agencies. The objective is to provide finance to local consulting firms to acquire human and material resources in order to substitute for the services of foreign consulting firms.

Cartel and Merger Policy

Brazil has had antitrust legislation since 1962. However, few cases have been brought before courts, and, as the material below suggests, companies charged with violating the law have considerable legal redress. Another aspect of competition policy appears in price controls, which is discussed below.

Antitrust

Since 1962, Brazil has had a law against abuse of economic power. The statute includes rules on what is considered a misuse of economic power to the detriment of the public interest. One of the principal features of the law is that it prohibits domination of the national markets or elimination of competition by means of acquisitions, mergers or incorporations, or by means of price fixing. The body charged with the responsibility for administering the law is the Administrative Council for Economic Defense (CADE).

CADE has had little success in winning cases. In 1973, CADE ruled that a Swiss electrical machinery company, Brown Boveri, had been illegally undercutting prices of motors made by a Brazilian manufacturer. Brown Boveri appealed the case in court and won. CADE also charged and fined Pepsi Cola several thousand dollars for restraint of trade for acquiring and destroying the empty bottles of two Coca-Cola bottlers. Pepsi appealed the case and won in 1978. Most recently CADE charged three foreign tire makers--Firestone, Goodyear, and Pirelli--with dumping and fined them over 5 million cruzeiros each. Subsequently, a Brazilian Federal judge reversed the decision on appeal.

Price Controls

The Government also has attempted to control prices from 1967 to 1980 and from 1983 to the present. The body responsible for enforcing price controls is the Interministerial Price Council (CIP). CIP has extensive authority to control the prices of over 4,000 firms that account for about 43 percent of Brazil's total manufacturing output during the year. In general, CIP maintains that it grants price increases when it can be demonstrated that a firm's profitability depends upon it. However, some large interindustry differences have been observed, suggesting distortions in relative prices. For example in some industries, including most notably pharmaceuticals and chemical products, the controlled prices increased significantly less than the uncontrolled prices. ^{1/} Furthermore, the evidence suggests that the industries most subjected to vigorous price controls are those characterized by oligopolistic market structures, substantial forward linkages, and foreign firm participation. Table 16 shows the 1980-84 price changes for some of the products and services subject to Government-administered prices.

Table 16.--Brazil: Annual percentage changes of prices of main products and services subject to Government-administered prices, by products and services, 1980-84 ^{1/}

Products and services	1980	1981	1982	1983	1984
Electric Energy-----	67.04	112.41	103.11	156.92	^{2/} 78.64
Telephone Services-----	69.12	98.37	90.44	127.46	^{2/} 64.90
Petroleum Derivatives					
Gasoline-----	125.66	66.67	96.47	166.47	^{2/} 51.00
Diesel Fuel-----	66.67	150.00	104.00	194.12	^{2/} 56.33
Fuel Oil-----	404.17	90.08	104.35	225.22	^{2/} 58.10
Liquified Gas-----	104.30	94.74	105.40	213.76	^{2/} 62.35
Coal-----	77.18	248.82	174.41	120.60	^{2/} 45.80
Steel Products-----	133.96	105.90	99.01	150.11	^{2/} 20.00
Mail and Telegraph Services-----	56.25	139.96	101.21	88.05	^{2/} 44.44
Railway Transport-----	79.40	112.06	98.24	152.59	^{2/} 89.00
Port Services-----	50.50	135.76	126.31	120.95	^{2/} 72.50
General Price Index - Domestic Supply--	110.20	95.20	99.70	211.00	^{3/} 47.70

^{1/} December-December.

^{2/} December-May 14.

^{3/} December-April.

Source: Brazil Economic Program: Internal and External Adjustment, Banco do Brasil, 1984.

^{1/} William Tyler, Op. cit., p. 23.

Targeting Techniques in Specific Brazilian Industries

Aerospace

Targeting in the aerospace industry has taken place through financial support for the privately owned but Government-controlled company, Embraer. Furthermore, through its science and technology spending, the Government has trained aerospace engineers and has built a research center devoted to aerospace. Lately, another private company, Avibras, has received Government support for its sales of missiles to overseas markets.

The centerpiece of the airplane industry in Brazil consists of Embraer and the Brazilian based companies that supply its parts. 1/ From 1969, when Embraer was founded, to 1984, it produced over 3,100 airplanes, and since 1977, an increasing percentage of Embraer's sales have gone to overseas markets. To help promote the capitalization of Embraer, the Brazilian Government allows 1 percent of the corporate income tax owed by companies in Brazil to be applied to the purchase of stock in Embraer. As a result, over 90 percent of Embraer is owned by almost 200,000 private firms. 2/

Though Embraer was not founded until 1969, the Brazilian Government was involved in this industry many years before when it trained a substantial number of aerospace engineers at Government expense and created the Aerospace Research Center (CRA) in 1954. In addition to promoting aircraft, the Aerospace Research Center has also been active in carrying out R&D on launching space vehicles. The Government has allocated approximately \$20 million for this purpose in 1984.

The Brazilian Government also promotes a private company, Avibras, to make ground-to-ground missiles. Avibras is supposed to receive \$500 million from a contract with Iraq to develop a missile launching vehicle similar to the Soviet Katucha. At present the project is still in the research stage. The project is conducted under the auspices of a joint program between Avibras and Contraves (a subsidiary of Oerlikon of Switzerland). Contraves will supply all the launching control systems.

Automobiles

The Brazilian Government targeted the automobile industry through incentives for import substitution and through export promotion. Both measures were designed to increase the level of local auto production.

1/ Of the approximately 24,000 items incorporated in Embraer's advanced planes, such as the popular Bandeirante model, about 17,000 items are locally manufactured. However, the most costly items, such as the avionics equipment, engine, and propellers, are usually imported from North America.

2/ World Bank, Op. cit., pp. 125-130. U.S. Department of Commerce, Brazil: A Survey of U.S. Export Opportunities, 1978, pp. 231.

Before the mid-1950's, Brazil had a small domestic automobile industry. ^{1/} However, about 1955, to attract international automobile firms the Government offered the following special incentives and conditions:

1. Duty-free import of capital goods and essential components,
2. A gradual "nationalization" requirement to reach a local content of 95 percent by 1960,
3. Prohibition of imported vehicles,
4. Fiscal, financial, and foreign-exchange advantages to the firms that participated in the program.

Table 17 shows the amount of foreign investment, approved by CDI, which these incentive packages attracted to Brazil. Not surprisingly, within a few years eleven companies, including Ford and General Motors, were producing automobiles in Brazil.

Table 17.--Brazil: Automobile investment approved for CDI and BEFIEX incentives, 1965-78

(In millions of U.S. dollars)				
Year	Approved by CDI	Approved by BEFIEX	Exports	
1965-----	59.9	^{1/}	-	
1966-----	39.2	^{1/}	-	
1967-----	128.9	^{1/}	-	
1968-----	-	^{1/}	-	
1969-----	83.0	^{1/}	4.1	
1970-----	308.4	^{1/}	8.8	
1971-----	1.4	^{1/}	11.3	
1972-----	777.0	^{1/}	51.7	
1973-----	87.0	211.3	54.9	
1974-----	-	647.8	179.4	
1975-----	-	79.3	324.9	
1976-----	-	2,188.2	350.5	
1977-----	-	20.7	493.7	
1978-----	-	-	690.7	

^{1/} Not applicable.

Source: Eduardo Augusto de Almeida Guimaraes, "A Dinamica de Crescimento da Industria de Automoveis no Brasil: 1957/58," Pesquisa e Planejamento Economico 10(3) (dezembro, 1980), p. 791.

In the early 1970's, to encourage exports, subsidies and import tariff reductions were awarded to auto manufacturers through the BEFIEX program in exchange for commitments to export. Table 11 shows the dramatic increase in exports between 1972 and 1976 largely promoted by the benefits of the BEFIEX program.

^{1/} World Bank, Op. cit., pp. 116-124.

To raise the quality of the product and make exporting easier, the amount of local content required by the Government was lowered to 85 percent for passenger cars and 75 to 80 percent for trucks. To the extent imported components came from country members of the Latin American Integration Association, the levels of local content were even lower.

The 1972 BEFIEX agreements, which originally were to have lasted for 10 years, were extended in 1982. According to the latest statistics from BEFIEX, the automobile manufacturers committed themselves to export about \$17 billion in exchange for easier access to about \$4 billion of imported capital and components and subsidies.

Computers

The principal technique used by Brazil to target computers is to reserve the production and sale of certain products to Brazilian "national firms." ^{1/} This market reserve policy relies heavily on the prohibition of foreign direct investment and on import controls to entice local investors to enter the market. The policy is accompanied by incentive programs of subsidies and tax relief tied to achieving local content.

Another major element of the policy was the establishment of a national computer firm, COBRA, owned by the Government. COBRA has developed several small computer models, but the company has yet to have a profitable year since it was founded.

In the early 1970's, the Brazilian Government formed two agencies to promote a domestic data processing industry. One was CAPRE, a coordinating agency to oversee the development of a computer industry, and the other was DIGIBRAS, a funding agency to provide capital for joint ventures with foreign firms. CAPRE eventually helped form COBRA, which used U.S. and British technology to become the first Brazilian computer manufacturer in 1974.

In 1977, while U.S. firms still dominated the Brazilian computer market and supplied 90 percent of imports, CAPRE invited all foreign computer firms in Brazil to submit proposals for creating joint ventures to produce minicomputers. In their proposals CAPRE required all minicomputer manufacturers to plan to (1) completely transfer technology within five years, (2) achieve export sales greater than imports, and (3) evolve to eventual Brazilian majority ownership. Under this plan CAPRE authorized four joint ventures between Brazilian and West German, Japanese, and French firms. CAPRE rejected the U.S. company proposals because all U.S. manufacturers refused to form joint ventures. Nonetheless, CAPRE allowed IBM and Burroughs to build large-scale computers locally.

^{1/} United Nations Center on Transnational Corporations, Transborder Data Flows and Brazil, 1983, pp. 60-102.

In 1979, the Government created the Special Secretariat for Informatics (SEI) to replace CAPRE. Because SEI was under the control of the National Security Council, this change is widely seen as enhancing the importance and influence of the Government role in the informatics sector. SEI has further restricted the market for foreign-owned firms by limiting software, computer services, and transborder data flows since 1981. ^{1/} In 1983, market reserve was extended to super minicomputers, digital instrumentation (including some biomedical instrumentation), microcomputer software and the Manaus Free Trade Zone. In 1984, SEI chose three Brazilian national firms to make the super minicomputer. ^{2/}

Also in 1984, a Brazilian informatics law was proposed by the Government and accepted by the Brazilian Congress. The law broadened the coverage of informatics policy to include any product with a digital component and confirms the role of SEI to implement the policy. However the law removed SEI from the aegis of the National Security Council, placing it instead under the control of a board of government and industry representatives. Perhaps most importantly, the law extends the market reserve policy for eight years. Furthermore, the law creates a wide range of financial incentives for Brazilian firms including income tax benefits, import tax benefits, and priority Federal funding.

Heavy electrical equipment

The heavy electrical equipment industry is an example of an industry where import substitution policies have promoted the rapid development of a domestic industry. In 1983, all but about \$150 million of the approximately \$1.2 billion spent on heavy electrical equipment, was spent on equipment made in Brazil. ^{3/} In the heavy electrical equipment industry, the policy of import substitution is enforced through procurement criteria that emphasize a high national content. The national content, however, is frequently supplied by Brazilian companies using foreign, as well as domestic, capital and technology.

The principal entity for coordinating Brazil's heavy electrical equipment purchases is ELETROBRAS, a mostly Government-owned company under the jurisdiction of the Ministry of Mines and Energy. As the planning and coordinating authority for the Brazilian electrical power projects, ELETROBRAS has promoted the rapid growth of domestic content in power projects. ELETROBRAS maintains 14 working groups actively concerned with the nationalization of materials, components, and equipment for the electric power sector.

^{1/} Business Week, "Why Brazil Guards its High-Tech Trade So Fiercely," June 13, 1983.

^{2/} The definition of "national" company is more tightly interpreted in the computer area than elsewhere. SEI requires that "The company must be a judicial person, regularly constituted in the country, have its headquarters in Brazil and be, in permanent and unconditional character, under the decisive technological and capital control of natural persons, resident and domiciled in the national territory, and have at least two-thirds of its technical body composed of Brazilians."

^{3/} Department of State, Airgram, "Industrial Outlook Report: Electric Power Equipment" Sept. 8, 1982.

By 1985, import substitution in heavy electrical equipment is expected to save the country about \$1 billion in foreign exchange. In constructing the Brazil-Paraguay Itaipu project, Brazilian industry has been capable of supplying 85 percent of the technology and equipment needed, including the largest hydraulic turbines and the most powerful hydrogenerators ever built. Table 18 shows how rapidly national content has grown between 1978 and 1980 and projects the growth to 1985 for major product categories.

Table 18.--Brazil: Share of domestic supply in the electric power equipment sector, by products, 1978, 1980, and 1985 1/

(In percent)				
Product	1978	1980	1985	
Transformers 30,138 kV, with commutator-----	45	50	80	
Transformers 10,500kV, without commutator-----	32	34	65	
Shunt reactors 10,500 kV-----	29	32	64	
Francis Turbines-----	70	82	83	
Kaplan Turbines-----	55	82	83	
Hydromechanic equipment-----	98	98	98	
Rolling bridges and portics-----	91	93	94	
Hydrogenerators-----	70	80	90	
Vapor power propelled generators up to 400 MVA----	55	70	80	
Synchronous compensators, up to 350 MVAR-----	70	70	80	
Static compensators-----	70	70	80	
Sectional keys, up to 750 kV-----	86	100	100	
Current transformers, up to 230 kV-----	91	91	95	
Current transformers, 345 and 500 kV-----	-	75	85	
Potency transformers, up to 138 kV-----	82	90	95	
Disjunctors up to 138 kV (PVO)-----	75	87	92	
Disjunctors 230 to 750 kV-----	40	40	80	
Lightning rods up to 230 kV-----	78	82	90	
All products-----	66.8	73.6	85.2	

1/ Data for 1985 are projected.

Source: U.S. Dept. of State airgram, Industrial Outlook Report: Electric Power Equipment, Sept. 8, 1982.

Footwear

The footwear industry in Brazil, usually among the top 6 or 7 largest export earners, received Government help, as one of the CDI-approved industries throughout most of the 1970's. 1/2/ This help consisted of tariff exemptions on imported equipment and raw materials and also other tax and financial incentives. More recently, the industry has received preferential working capital financing for exports, income tax reductions for its export earnings, and reductions in certain value-added taxes tied to the amount of exports. In 1983, the level of this assistance was estimated by the U.S. Department of Commerce to be approximately 3.5 percent of the value of the products exported to the United States. 3/

Pharmaceuticals

The Government efforts in Brazil's pharmaceuticals industry have primarily relied on rigidly controlling the price of drugs over a long period of time. Even when price controls were relaxed for most products, from 1980 to early 1983, controls were maintained for pharmaceuticals. 4/

For many years the Government of Brazil has also been concerned with the heavy dependence in this sector upon imports which in 1982 amounted to \$270 million, and with the predominance of foreign firms in the industry. Of \$1.3 billion in sales in 1983, U.S. subsidiaries contributed 40.6 percent, West German, 17.8 percent, Swiss, 11.2 percent, and other foreign firms, 23.5 percent. Only the remaining 6.9 percent was accounted for by Brazilian firms.

Official concern for the small market share of Brazilian firms was expressed in a draft decree, presented to the President for signature in June 1983. The purpose of the decree was to promote national control of pharmaceutical companies by providing import protection and incentives for national firms. Although the measure was not signed, the Brazilians are still interested in promoting national firms in this sector.

1/ U.S. Department of State, Airgram, Industrial Outlook Report: Leather Footwear Report--Brazil," Mar. 15, 1983.

2/ U.S. Department of Commerce, Op. cit., pp. 220-230.

3/ Federal Register, "Preliminary Results of Administrative Review of Countervailing Duty Order; Nonrubber Footwear from Brazil," vol. 48, No. 47, Mar. 9, 1983, p. 9902. This investigation was part of a review of an earlier countervailing duty finding. Because the U.S. International Trade Commission determined that the industry was not injured in 1983, the countervailing duty was removed. Certain Nonrubber Footwear from Brazil, India, and Spain, (Investigation Nos. 104-TAA-16,17, and 18). USITC Publication No. 1388, May 1983.

4/ U.S. Department of Commerce, "Monitoring of Foreign Industrial Targeting Practices," 1983.

Semiconductors

The Brazilian Government, through a market reserve policy is prohibiting foreign investment in the semiconductor industry. As in the computer industry, this policy is administered by the SEI. In addition to restricting foreign investment, SEI also attempts to limit the level of semiconductor imports, and to pressure Government-controlled telecommunications companies and private enterprises in computer/peripherals, consumer electronics, and electronic process control to purchase from domestic suppliers. Because only two of the 17 firms making semiconductors in Brazil are owned by Brazilian nationals, the Government has proceeded more slowly in semiconductors than in computers. Nonetheless, SEI has prevented foreign investments in the industry.

One example of restricting foreign investments in the semiconductor area is the experience of Philco. Philco proposed expanding its analog semiconductor plant to include making digital semiconductor chips. However, SEI turned down the request, and in early 1984 Philco sold its semiconductor plant to a Brazilian-owned company, Sharp. 1/

Steel

Since the 1950's, the Brazilian Government has sought to become self-sufficient in steel. At first the Federal Government hoped that local private investors and State governments would be able to achieve this goal themselves. However, as their resources proved too limited, the Federal Government, through the BNDE became the principal source of capital and the major stockholder in most of the industry. Today, about 60 percent of steel capacity is owned directly by the Government and is controlled by a Government holding company, SIDERBRAS. Another Government agency, CONSIDER, coordinates all steel expansion plans. In the late 1970's, Brazil became self-sufficient and today it exports more steel than it imports. 2/

Brazilian targeting in steel has taken place through Government funding of the industry, export subsidies, and import protection. The Government has invested heavily in steel. In 1977, a 10-year plan envisaged investments of \$40 billion. 3/ Export subsidies have been extensive. According to the Department of Commerce, in 1982 Brazilian Government subsidies took the form of preferential working capital financing, Government provision of equity capital, assistance in paying foreign loans, subsidized export financing, tax credits for exports, and other measures. The Department of Commerce estimated that the value of the subsidies ranged from 11.72 percent to 27.42 percent of the export price. 4/ With regard to imports, CONSIDER, the Government agency that coordinates steel planning can issue permits for steel products.

1/ "Tough Choices in Brazil: As the Junta Squeezes High-Tech Multinationals," Business Week, Dec. 19, 1983, p. 44.

2/ U.S. Department of State, Airgram, "Industrial Outlook Report--Brazil's Iron and Steel Industry," 1983, Sept. 8, 1983.

3/ Department of Commerce, Brazil: A Survey of U.S. Export Opportunities, 1979, pp. 179-189.

4/ Department of Commerce, Determination on non-Arrangement cases: Brazil, 1982.

Shipbuilding

Using Government financing to stimulate shipbuilding, Brazil went from an insignificant shipbuilder in 1958 to become the world's second largest shipbuilder, after Japan, in 1980. Although sales from Brazilian shipyards have fallen since 1980, Brazil still has the capacity of a major shipbuilder.

The main Government agency in shipbuilding is SUNAMAM, the National Superintendency of the Merchant Marine. SUNAMAM not only regulates shipping but also promotes the shipbuilding industry. Before 1983, one of the principal elements of SUNAMAM's promotion role was running the Merchant Marine Fund established in 1958. This fund made SUNAMAM a kind of bank to advance the shipbuilding industry. Since early 1983, however, this fund and other funding of shipbuilding has been carried out by the National Economic and Social Development Bank, BNDES. BNDES provides export financing with interest equalization loans that subsidize rates of foreign commercial bank loans for a ship purchase to the level of subsidized European rates. The Banco do Brasil's foreign trade office announced in 1984 that another \$500 million will be available for ship export financing under the plan. 1/

Since it began in the 1940's, SUNAMAM has had two goals; not only should Brazil have its own merchant fleet, but Brazil should also have the capability to build the fleet. Brazil has succeeded on both counts. In 1958, Brazil had a merchant fleet totaling about 1 million deadweight tons (DWT). By 1982, this had grown to 8.7 million DWT. Beginning in 1970, Brazil started 5-year plans for its shipbuilding industry. The objective of the first, 1970 plan, was to provide a national fleet of 5 million DWT by 1975. With investments exceeding \$1 billion, about 200 vessels were built. 2/

Currently, there are 12 shipbuilders in Brazil. Increasingly these shipbuilders are attempting to sell their ships overseas, as the domestic market continues to decline in part because it is saturated and in part because of the domestic economic slump. Table 19 shows the number of ships sold overseas since 1964.

Telecommunications

In the telecommunications industry, the Brazilian Government has sought to promote import substitution and the nationalization of multinational companies operating in Brazil. The Government, as the sole purchaser of telecommunications equipment, has had considerable success in meeting these two goals. By 1981, imports of telecommunications equipment had fallen to \$107 million from \$315 million in 1975. During the last five years, foreign manufacturers with established operations in Brazil--Ericson, ITT, GTE, Philips, Siemens, Plessey and NEC--have been forced to take on Brazilian partners as majority shareholders.

1/ Instituto de Estudios de la Marina Mercante Iberoamericana, Latin American Shipping, 1984, p. 53.

2/ "Brazil's Maritime Policy: Shipping, Shipbuilding and the Current Doldrums", Department of State, Telegram No 5015, Nov. 17, 1983.

Table 19.--Brazil: Exports of vessels, 1964-85

	Vessels	Craft	DWT	US \$
Total delivered:				
1964-----	2	-	26,200	5,210,000
1965-----	1	-	3,040	927,000
1966-----	1	1	3,040	2,727,000
1971-----	1	-	25,000	4,700,000
1972-----	2	-	24,000	14,600,000
1973-----	-	50	15,000	2,000,000
1974-----	-	10	-	1,984,253
1975-----	-	1	-	701,080
1976-----	6	2	90,000	29,115,872
1977-----	3	8	62,500	39,380,000
1978-----	11	2	254,400	129,148,480
1979-----	9	9	301,800	136,606,676
1980-----	10	7	159,400	108,262,879
1981-----	8	4	297,340	170,373,612
1982-----	5	16	265,150	154,358,744
Total-----	59	110	1,526,870	800,095,596
Total on order:				
1983-----	7	4	419,700	324,950,000
1984-----	4	-	152,600	91,350,000
1985-----	2	-	77,000	52,000,000
Total-----	13	4	649,300	468,300,000

Source: Estaleiros Associados do Brasil (Association of Brazilian Shipyards)

TELEBRAS is the state entity responsible for the telephone system, and EMBRATEL is responsible for the radio-telegraph network. In addition to using procurement practices to encourage higher indicies of nationalization, tariff rates are also substantial, ranging from 30 to 145 percent of the c.i.f. value of the product.

Textiles and apparel

Government assistance in the textile and apparel industries consisted of CDI-investment approval and investment benefits from 1969 to 1980. CDI-approved investments received significant benefits including (1) reduced import duties, (2) reduced border taxes on imports, (3) a waiver of prior deposit on imports, (4) access to official subsidized credits, (5) exemption from certain value-added taxes (IPI and ICM) for the purchase of domestically produced capital goods, and (6) allowance of accelerated depreciation for income tax purposes for the use of domestic capital equipment. Table 20 shows the level of CDI-approved investments from 1969 to 1980.

Table 20.--Brazil: Projects approved for CDI investment incentives in the textile industry, 1969-80

Industrial sectors	(Fixed investment in thousands of cruzeiros)													
	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980		
Manmade textiles-----	215,785	200,209	371,489	293,367	832,280	257,459	4,758	79,354	-	15,204	-	-	-	-
Spinning, weaving, finishing-----	104,836	207,867	199,002	414,644	1,562,597	2,095,425	696,564	463,877	117,989	97,363	108,293	65,560	-	-
Knitted fabrics: Knitting, finishing and madeup knitwear-----	47,344	31,206	28,053	134,961	515,530	328,462	9,790	-	-	-	-	-	-	-
Hosiery-----	12,988	1,085	2,345	1,926	9,201	2,928	-	-	-	-	-	-	-	-
Texturing-----	12,977	2,410	12,337	68,959	78,729	2,933	19,037	-	-	-	2,204	-	-	-
Textile specialties-----	32,003	50,535	144,539	60,190	196,924	164,814	155,883	51,097	-	-	16,987	52,360	-	-
Total-----	425,933	493,312	757,765	974,047	3,195,261	2,852,021	886,034	594,308	117,989	112,567	127,484	117,920	-	-
Source: Sindicato da Industria de Fiacao e Tecelagem em Geral, no Estado de Sao Paulo. Ministerio da Industria e do Comercio - CDI.														

Note.--The above does not include investments which do not involve the IDC.

Since 1981, CDI has not approved textile apparel products for investment benefits. However, many of the benefits available to companies that export have been retained. These include preferential financing for exports, income tax exemptions for export earnings, the export credit tax premium, and other fiscal benefits for special export programs.

CANADIAN INDUSTRIAL POLICY AND TARGETING

Industrial Policy in Canada

Canada shares with the United States a belief in the efficacy of the market process and a commitment to the free-enterprise system. However, Canada faces a number of problems that clearly distinguish it from the United States. Its economy is small (one-tenth the size of the United States economy), and the population is geographically dispersed and culturally diverse.

Also, the economy is closely tied to the United States by a network of powerful economic and financial relationships. The desire for maintaining a distinct national identity in face of these close ties is perhaps one of the most basic forces contributing to the formation of policy in Canada. For example, this desire is manifested in the concern over foreign ownership of enterprises located in Canada. Maintaining national identity and economic unity between east and west Canada is continually in tension with the north-south pull for cultural homogenization between Canada and the United States.

Historical overview

In the post-World War II era, Canada has established programs to maintain control over its natural resources and at the same time expanding its own industrial base and reducing its dependence on U.S. capital. During the 1950's, Canada remained open to direct foreign investment and played a major role in trade liberalization within the GATT. Government intervention in the Canadian economy was minimal. However, the late 1960's and early 1970's saw the special bilateral relationship between Canada and the United States increasingly challenged.

Among the conditions that led to an evaluation of Canadian industrial development policies was the increasing disparity in regional economic performance within Canada, the quickly expanding domestic labor force, the intensification of international competition, specifically from Europe and Japan, and the rapid dissemination and application of technological advances which favored the growth of the large multinational corporation.

Beginning in the late 1960's, a series of reports by the Canadian Government 1/ heightened Canadian consciousness of the extent of Canada's economic and cultural dependence on the United States; this increased public concern led to demands for Government action. The special relationship between the United States and Canada, 2/ which had earlier been nurtured and had resulted in such agreements as the Automotive Products Trade Agreement (APTA) of 1965 3/ (by which free trade in automotive products was established

1/ Task force report on foreign ownership (Watkins report) 1968; Special Senate Committee on the mass media (Davey report) 1970; Task force on foreign direct investment in Canada (Gray report), 1972.

2/ The special relationship is perhaps best illustrated by a 1965 joint U.S.-Canadian report entitled Principles of Partnership, where the concept of partnership was endorsed as being central to the bilateral relationship.

3/ For further discussion of APTA, see section below on automobiles.

between the United States and Canada), was undermined by international conditions and concerns. In 1971, the United States, responding to chronic U.S. balance-of-payments pressures, announced a "New Economic Policy." Among the measures was a 10-percent surtax on imports. The refusal of the U.S. Government to exempt Canada from the surtax prompted Canada's reappraisal of the "special" relationship because its vulnerability to U.S. policy actions was highlighted. The Canadian appraisal led to the Third Option position by which Canada, rejecting both the status quo and a closer bilateral integration, opted for "a comprehensive long-term strategy to develop and strengthen the Canadian economy and other aspects of natural life." The Third Option sought diversification in Canada's economic relations to achieve less dependence on the United States.

The traditional "special" relationship has now taken on a cast of interdependence. The deep-rooted stability of the U.S.-Canadian relationship has occasionally been overshadowed by the irritants that inevitably mark such a close relationship.

Canada responded to the changing economic environment by instituting a number of new programs to improve the climate for industrial development and to enhance productivity. In 1973, the Foreign Investment Review Agency (FIRA) was established to screen prospective foreign-owned enterprises as well as possible foreign takeovers. FIRA's concerns in evaluating investment ventures included export development, technology transfer, consumer satisfaction, and the desire for Canadian input into corporate policy decisions.

No national consensus exists on the notion that the course of industrial policy should be one of specialization in resource extraction and related industries. ^{1/} On the contrary, Canada would like to diversify its export base by achieving growth in high-technology industries such as telecommunications, informatics, and microelectronics while preserving its export potential in such industries as automobiles, airplanes, and farm machinery.

The Royal Commission on the Economic Union and Development Prospects for Canada (called the Macdonald Commission after its chairman) was named in early 1983. It issued an initial report, Challenges and Choices, in April 1984. The report was based on extensive hearings conducted across Canada in the fall of 1983. It touched upon a number of issues and outlined eight sets of major concerns to the country, one of them being trade and industrial development. Although the Commission's final report and recommendations will not be issued until mid-1985, the initial report does provide an insight into current Canadian thinking on industrial strategy. The two objectives which are cited as central to the issue are secure and growing markets and balanced industrial development.

^{1/} Resource-based industries include grains, fisheries, forestry products, fossil fuels and minerals.

"The industrial policies that will be required turn very much on the size of the reasonably secure market to which Canadians have access, and on the growth potential of that market. . . . perhaps the most basic choice in terms of industrial development involves the choice as to Canada's future trade orientation. Selecting one orientation or another will determine what industrial approaches need to be emphasized and the extent of government involvement required to achieve the industrial development that is sought." 1/

The recent Canadian sectoral free-trade initiative can be seen as indicating a possible direction or orientation for the Canadian economy. The Macdonald Commission outlines the choices before the country in the area of trade and industrial development by presenting a number of specific policy questions in each of six areas: trade orientation, specialization, regional development, adjusting to change, foreign investments and ownership, and competition policies.

Although the specific policy suggestions in each of these areas must await the publication of the Commission's final report, certain goals of Canadian industrial policy may be identified: 2/

- (1) Increased value added and national benefits from the development of Canadian natural resources;
- (2) Nationalization of Canadian manufacturing to meet the international competition that is following the Tokyo Round tariff reductions;
- (3) Greater Canadian participation in high-technology industries including more indigenous industrial R&D;
- (4) Greater regional balance in economic development; and
- (5) Greater Canadian ownership and control over the means of production, especially in the critical energy sector.

Home Market Protection

Over one-fourth of Canadian gross domestic product (GDP) is related to trade. Since the recent recession, the trade sector has been acting as the motor for the recovery of the Canadian economy. One significant element of this has been the overall merchandise trade surplus, which amounted to US\$6.6 billion in 1983. 3/ At the same time the United States reached a record high trade deficit of US\$15 billion with Canada. Because of the importance of trade within the Canadian economy, certain industries are protected by direct policy measures such as tariffs and quotas.

1/ Challenges and Choices, pp. 34 and 36.

2/ Peter Morici, The Global Competitive Struggle: Challenges to the United States and Canada (Washington: National Planning Association, 1984), pp. 48 and 49.

3/ Unless otherwise stated, in this section dollars will mean Canadian dollars.

With the exception of products that are controlled commodities (i.e., dairy products, animal feeds, cocoa, and so forth), Canada has no special requirements to obtain an import license or permit. ^{1/} The importation and sale of products such as drugs, seeds, food, and potentially hazardous items is regulated in Canada. The Department of External Affairs administers all import licensing.

International economic performance

In 1983, Canada's foreign trade flows amounted to US\$73.3 billion in exports and US\$66.8 billion in imports (table 21). Fueled by the U.S. recovery, the value of Canadian exports to the world increased 8.1 percent (exports to the United States increased 6 percent). As the Canadian economy improved during 1983, demand was sparked and imports into Canada increased 12.3 percent. Increasing exports and imports resulted in a slight decrease in the merchandise trade balance--from the record US\$8.4 billion surplus of 1982, to a US\$6.6 billion surplus in 1983. ^{2/} The major contributors to the surplus were forest products, cereal and cereal preparations, natural gas, and motor-vehicle products.

Although Canada's trade with some industrial countries fell noticeably, the U.S. position as Canada's most important trading partner intensified during the year, 73 percent of Canadian exports were purchased by the United States, which in turn supplied 72 percent of Canada's imports. ^{3/} The bilateral trade between the United States and Canada represents the largest volume of trade between any two countries in the world. ^{4/}

Merchandise trade with the United States

In 1983, the United States recorded a US\$15 billion merchandise trade deficit with Canada (table 22). ^{5/} This was a record high, surpassing the previous high of nearly US\$14 billion in 1982--a level substantially greater than the ordinary U.S. deficit in bilateral trade with Canada. The bilateral deficit was US\$5.6 billion in 1979 and has grown each year since. The 1983 deficit of US\$15.4 billion accounted for over one-fourth of the total U.S. merchandise trade deficit.

^{1/} Doing Business in Canada, Price Waterhouse Information Guide, 1979, p. 44.

^{2/} Canada's 1983 merchandise trade surplus with the United States accounted for 79 percent of its total merchandise surplus. This contrasts with shares of 64 and 51 percent in the previous 2 years.

^{3/} Exports to Canada constituted 18.6 percent of total U.S. exports in 1983; imports from Canada were 20.3 percent of total U.S. imports for the year.

^{4/} Although most Americans think of Japan or the European Community as the major U.S. trade partners, trade with Canada is twice as large as that with any other country. The near 90 billion U.S. dollars in two-way trade is approximately equal to that between the United States and all of the EC countries taken together.

^{5/} Certain discrepancies exist between official U.S. Department of Commerce statistics and those of the International Monetary Fund contained in table 21.

Table 21.--Canada: Trade and trade balances, by selected trading partners, 1981-83

(In millions of U.S. dollars)			
Trading partner	1981	1982	1983
Exports			
Industrialized countries:			
Japan-----	3,647	3,712	3,869
United States-----	46,454	46,528	53,847
EC-----	7,246	6,104	5,514
Other-----	1,862	1,532	1,234
Total-----	59,209	57,876	64,464
Developing countries:			
Oil-exporting countries-----	2,040	2,108	1,560
Mexico-----	609	369	309
Other-----	4,110	4,147	3,969
Total-----	6,759	6,624	5,838
Nonmarket economy countries:			
China-----	776	1,005	1,189
U.S.S.R-----	1,491	1,665	1,430
Other-----	764	657	416
Total-----	3,031	3,327	3,035
Grand total-----	68,999	67,827	73,337
Imports			
Industrialized countries:			
Japan-----	3,705	3,149	3,934
United States-----	49,746	42,371	48,627
EC-----	5,783	5,094	5,263
Other-----	1,930	1,637	1,794
Total-----	61,164	52,251	59,618
Developing countries:			
Oil-exporting countries-----	5,174	2,746	1,873
Mexico-----	876	886	962
Other-----	3,550	3,088	3,840
Total-----	9,600	6,720	6,675
Nonmarket economy countries:			
China-----	201	181	219
U.S.S.R-----	67	38	31
Other-----	409	250	218
Total-----	677	469	468
Grand total-----	71,441	59,440	66,761

Table 21.--Canada: Trade and trade balances, by selected trading partners, 1981-83--Continued

(In millions of U.S. dollars)			
Trading partner	1981	1982	1983
	Trade balance		
Industrialized countries:			
Japan-----	-58	563	-65
United States-----	-3,292	4,157	5,220
EC-----	1,463	1,010	251
Other-----	-68	-105	-560
Total-----	-1,955	5,625	4,846
Developing countries:			
Oil-exporting countries-----	-3,134	-638	-313
Mexico-----	-267	-517	-653
Other-----	560	1,059	129
Total-----	-2,841	-96	-837
Nonmarket economy countries:			
China-----	575	824	970
U.S.S.R-----	1,424	1,627	1,399
Other-----	355	407	198
Total-----	2,354	2,858	2,567
Grand total-----	-2,442	8,387	6,576

Source: Compiled from International Monetary Fund Direction of Trade data.

Table 22.--Canada: U.S. trade with Canada, by SITC Nos. (Revision 2), 1981-83, January-August 1983, and January-August 1984

		(In thousands of U.S. dollars)					
SITC section No.	Description	1981	1982	1983	January-September--		
					1983	1984	
U.S. Exports							
0	Food and live animals-----	1,629,517	1,487,984	1,488,027	975,678	1,027,949	
1	Beverages and tobacco-----	49,679	62,462	68,135	48,944	36,436	
2	Crude materials--inedible, not fuel-----	1,814,506	1,351,641	1,587,717	1,026,835	1,213,462	
3	Mineral fuels, lubricants, etc-----	1,904,719	1,927,733	1,692,125	960,202	1,236,073	
4	Oils and fats--animal and vegetable-----	35,011	30,681	32,956	19,871	29,578	
5	Chemicals-----	2,576,826	2,252,967	2,639,724	1,744,130	1,937,006	
6	Manufactured goods classified by chief material-----	4,586,613	3,497,891	3,904,797	2,521,347	2,948,709	
7	Machinery and transportation equipment-----	20,771,457	17,726,254	20,646,148	13,202,718	17,319,394	
8	Miscellaneous manufactured articles-----	2,670,030	2,505,232	2,637,037	1,708,056	1,857,779	
9	Commodities and transactions not elsewhere classified-----	2,095,162	1,572,412	1,848,230	1,232,756	2,469,680	
	Total, all items exported to Canada-----	38,133,519	32,415,257	36,544,897	23,440,537	30,076,065	
U.S. imports							
0	Food and live animals-----	1,615,717	1,868,992	1,979,138	1,347,306	1,504,285	
1	Beverages and tobacco-----	408,922	436,122	470,173	284,375	313,991	
2	Crude materials--inedible, except fuel-----	5,239,329	4,290,441	5,287,095	3,429,307	3,881,247	
3	Mineral fuels, lubricants, etc-----	7,426,721	7,877,057	8,111,519	5,541,253	5,975,599	
4	Oils and fats--animal and vegetable-----	7,276	6,608	8,995	4,794	6,671	
5	Chemicals-----	2,815,959	2,675,750	2,469,012	1,629,687	2,005,986	
6	Manufactured goods classified by chief material-----	8,730,729	7,636,780	8,551,611	5,466,520	7,198,015	
7	Machinery and transportation equipment-----	14,961,027	16,992,389	20,116,063	12,479,896	18,655,031	
8	Miscellaneous manufactured articles-----	1,599,914	1,612,297	1,959,109	1,244,062	1,675,144	
9	Commodities and transactions not elsewhere classified-----	2,970,424	2,932,075	3,029,633	2,026,201	2,478,898	
	Total, all items imported from Canada-----	45,776,018	46,328,510	51,982,346	33,453,401	43,694,867	

Source: Compiled from official statistics of the U.S. Department of Commerce.

The value of U.S. exports to Canada increased 11.3 percent in 1983, after falling by 15.0 percent the previous year. The 1983 level of exports--US\$36.5 billion--is still 4.2 percent below the 1981 level. For the first 8 months of 1984, U.S. exports to Canada were 22 percent above the level of exports for the corresponding period of 1983.

U.S. imports from Canada were valued at US\$52.0 billion in 1983, representing an 11-percent increase over that of 1982. This was the highest amount recorded for any trading partner in 1983 and the highest level ever with Canada. The 11-percent increase in 1983 contrasts sharply with the 1.2 percent increase for the year before. Imports for January-August 1984 outpaced imports for the corresponding period of 1983 by 23 percent.

The following tabulation shows the five leading items exported to Canada from the United States (in billions of U.S. dollars):

Description	1982	1983	January-August--	
			1983	1984
Certain parts of motor vehicles except chassis and bodies-----	4.1	4.8	3.0	4.3
Passenger cars-----	2.4	3.9	2.5	3.1
Coal-----	1.1	1.0	.5	.8
Piston-type engines-----	.8	.8	.6	.5
General merchandise, less than \$500-----	.8	.8	.5	.8

The five leading items were unchanged both in 1983 and in January-August 1984 compared with those items in from 1982. Exports of all the items but coal increased from 1982 to 1983. Other significant U.S. exports included gold or silver bullion, parts of office machinery, digital central-processing units, trucks, and parts of engines.

The five leading items imported from Canada in 1983 were as follows (in billions of U.S. dollars):

Description	1982	1983	January-August--	
			1983	1984
Passenger automobiles-----	5.8	7.3	4.7	6.8
Natural gas, methane, ethane, propane, and butane-----	4.8	4.3	3.0	2.8
Parts of motor vehicles-----	1.8	2.8	1.6	2.5
Trucks, valued at \$1,000 or more-----	2.6	2.7	1.6	2.5
Standard newsprint paper-----	2.7	2.7	1.8	2.1

These five items accounted for 38.1 percent of total U.S. imports from Canada, and are the same items which led the list of imports from Canada in 1982. Imports of all five, except natural gas, ethane, and so forth increased between 1982 and 1983. The dropoff in such imports is continuing through January-August 1984.

In Canada, foreign trade is acting as the motor for the recovery of the Canadian economy. At a time when the Canadian dollar is worth approximately 76 U.S. cents, the Canadians have not found it difficult to take advantage of larger markets in an expanding U.S. economy. As Canadian sales to the United States have grown, sales to West Germany, France, and Great Britain have been contracting. Canada's 1983 surplus with the United States was largely counterbalanced by a deterioration in trade with other countries.

Tariffs

At the beginning of the 1970's, Canadian tariffs were higher, on the average, than those of other major industrial countries. Although the Tokyo round tariff cuts will bring average Canadian tariffs more into line with those of its trading partners when they are completed by 1987, the structure will still protect manufactured and processed products more than primary commodities and extractives. The average incidence of the Canadian tariff on all imports is between 4 and 5 percent; this average is between 12 and 13 percent when only dutiable goods are considered. Within manufacturing, above average protection (i.e., greater than 10 percent) is afforded to the following sectors: textiles and apparel, furniture, shipbuilding, leather products, alcoholic beverages, and electrical equipment. 1/

In January 1984, the Canadian Government announced the imposition of a surtax to be applied to specialty steel originating in the United States. The surtax, ranging to 7.7 percent, is the direct result of U.S. actions restricting imports of specialty steel, following a section 201 investigation in 1983. The surtax was revoked in June.

Quotas

Autos.--Trade in automobiles between the United States and Canada is largely governed by a bilateral agreement between the two countries. 2/ The agreement provides for mutual free trade in new automobiles and original vehicle equipment. The United States allows this duty-free status to both individuals and manufacturers while Canada gives this status to manufacturers which have production facilities within its borders. Thus, individuals importing U.S.-made automobiles into Canada are subject to duties. 3/

1/ Peter Morici, Arthur J. R. Smith and Sperry Lea, Canadian Industrial Policy (Washington: National Planning Association, 1982), p. 34.

2/ The Automotive Products Trade Act is discussed separately in a subsequent section on targeting in specific Canadian industries--automobiles.

3/ In the United States anyone may import a finished vehicle covered by the agreement duty free. In Canada, however, the duty-free import privilege is limited to vehicle manufacturers. Individuals importing motor vehicles or parts thereof from the United States would pay the Canadian duty.

Canada, like the United States, has set up a voluntary export restraint (VER) with Japan over the number of its autos to be supplied to Canada.

Footwear.--Canada has maintained quotas on imports of shoes since December 1977. Originally, global quotas were imposed on all shoes except canvas and rubber footwear. Canada lifted the quota on leather footwear when the original quotas expired in November 1981. At that time, limitations were continued on all shoes except those of rubber and leather. ^{1/} When Canadian quotas on footwear were renewed, the EC received compensation from the Canadians in the form of reduced tariffs on other products.

The May 1984 decision by the Canadian Government to extend the application of quotas on leather and nonleather footwear has resulted in the EC requesting bilateral negotiations under the GATT. The EC protested that the quotas were not merely extended, but were also increased by 3 percent. The extension is to continue through March 31, 1986.

Textiles and apparel.--Canada, like the United States, is a signatory to the Multifiber Arrangement (MFA) and thereby has entered into a series of bilateral agreements with certain countries. These agreements establish aggregate limits on the volume of textile imports into Canada.

Restrictions on foreign investment

Foreign Investment Review Agency.--In most of the post-World War II era, Canada has attracted more foreign direct investment than any other nation. ^{2/} Consequently, entire sectors of Canadian industry are dominated by foreign corporations. As of 1980, the United States had investments totaling US\$49 billion in Canada, about 80 percent of the total foreign investment in Canada. U.S. investments control large shares of the automotive, mining, chemicals, pulp and paper, rubber, petroleum, textiles, electronics, and machinery industries. ^{3/}

Canada has invested US\$17 billion in the United States. This is approximately 50 percent of all Canadian foreign investment. In proportion to their economies, Canada has more invested in the United States than the United States has in Canada.

Shares of direct foreign investment in Canada in 1978 are (in percent):

United States-----	79.4
Great Britain-----	9.3
All other-----	<u>11.3</u>
Total-----	100.0

^{1/} Most Canadian footwear manufacturers are leather shoe producers. The earlier import limitations were accompanied by a \$17 million program to modernize and restructure the footwear and tanning industries. Adjustment assistance benefits were also offered to workers in the sector.

^{2/} Willis C. Armstrong, Louise S. Armstrong and Francis D. Wilcox, Canada and the United States: Dependence and Divergence, (Cambridge: Ballinger Publishing Co., 1982), p. 113.

^{3/} Ibid.

Comparable figures for the United States, as of 1981, by countries are as follows (in percent):

Netherlands-----	22.5
United Kingdom-----	17.3
Canada-----	13.6
West Germany-----	7.8
Japan-----	7.7
France-----	6.5
Other Europe-----	10.1
Latin America-----	9.3
All other-----	5.2
Total-----	100.0

The degree of foreign ownership of specific Canadian industrial sectors is illustrated in table 23. 1/

Table 23.--Canada: Foreign ownership and control of selected industries, 1976 (in percent)

	Foreign ownership			Foreign control		
	U.S.	Other	Total	U.S.	Other	Total
Petroleum and natural gas----	40	11	51	54	14	68
Other mining and smelting----	45	12	57	41	14	55
Manufacturing, total-----	41	9	50	42	13	55
Beverages-----	21	10	31	<u>1/</u>	<u>1/</u>	29
Rubber-----	<u>1/</u>	<u>1/</u>	73	<u>1/</u>	<u>1/</u>	98
Textiles-----	21	6	27	22	10	32
Pulp and paper-----	41	12	53	29	13	42
Agricultural machinery--	<u>1/</u>	<u>1/</u>	52	<u>1/</u>	<u>1/</u>	50
Automobiles and parts----	<u>1/</u>	<u>1/</u>	92	<u>1/</u>	<u>1/</u>	96
Other transport. equip.--	34	11	45	38	16	54
Iron and steel mills----	9	2	11	<u>1/</u>	<u>1/</u>	2
Aluminum-----	42	12	54	0	0	0
Electrical apparatus----	58	8	66	62	11	73
Chemical-----	52	14	66	58	16	74
Other manufacturing-----	39	10	49	46	16	62
	:	:	:	:	:	:

Source: Morici, Smith and Lea, op. cit., p. 37.

1/ In table 23, the term "foreign ownership" means the proportion of long-term capital invested by Canadians and by nonresidents in Canadian enterprises. "Foreign control" means the proportion of total capital employed in Canadian-controlled and in nonresident-controlled enterprises.

In the 1960's Canadians became increasingly sensitive to the impact that foreign investment could have on the Canadian economy. 1/ Following the report of a task force on foreign direct investment in Canada, 2/ the Foreign Investment Review Act was passed in 1973. The Act established the Foreign Investment Review Agency to screen new investments in Canada in order to ensure maximum local advantage. FIRA reviews two types of foreign investment cases:

- (1) acquisitions of control by non-Canadians of existing businesses in Canada; and
- (2) establishment of new businesses in Canada by non-Canadians who either do not already have a business in Canada or do not have a business in Canada to which the new business is or would be related.

FIRA reviews applications on a case-by-case basis and makes recommendations to the Minister of Regional Industrial Expansion for approval or denial. The Minister typically adopts these recommendations, and the requisite Cabinet consent in the matter is usually routine.

When reviewing an application, FIRA attempts to determine whether the proposed investment is likely to be of significant benefit to Canada by examining the following five factors:

- (1) The effect of the investment on the level and nature of economic activity in Canada, including the effect on employment, on resource processing, on the utilization of parts, components and services produced in Canada, and on exports from Canada;
- (2) The degree and significance of participation by Canadians in the business enterprise and in the industry sector to which the enterprise belongs;
- (3) The effect on productivity, industrial efficiency, technological development, innovation, and product variety in Canada;
- (4) The effect on competition within any industry or industries in Canada; and
- (5) The compatibility of the investment with national industrial and economic policies, taking into consideration industrial and economic policy objectives enunciated by a province likely to be significantly affected by the proposed investment. 3/

Approval of investment applications may be conditional on promises to fulfill specific undertakings. These undertakings can be part of a written contractual agreement between the applicant and FIRA, covering such areas as production and export levels, research and development expenditure, technology transfer stipulations, the amount of Canadian participation in management

1/ This sensitivity is not unlike a concern over Arab investment in the United States in the wake of the oil price hikes of the 1970's.

2/ Commonly referred to as the Gray Report.

3/ "Foreign Investment Review Act-Businessman's Guide," p. 4-5, Government of Canada, Foreign Investment Review Agency.

decisions, and the dispersion of equity. A specified percentage of local content had been included in some previous undertakings. In 1982, the U.S. filed a grievance to the GATT Council in order to stop the practice of sometimes requiring a certain amount of local content. The Council ruled against FIRA's practice of conditioning investment, finding it in violation of Article III(4) which states that imported products are to be treated on the same level as those of the home country. FIRA has attempted to comply with that ruling by stipulating in its agreement with foreign investors that Canadian sources have "full and fair opportunity to supply goods." In the past, the requirement was stricter: the investor was required to buy from a Canadian source if the input was available on competitive terms.

FIRA excludes from its review process acquisitions of Canadian businesses with gross assets under \$250,000 and gross revenues under \$3 million when the investor already has an existing Canadian business which is related to the one being acquired. Furthermore, any new investment used to augment an investor's previously existing business does not require FIRA examination. Also, since 1982 a shortened review procedure has been in effect for smaller businesses (defined as having less than \$5 million in gross assets and fewer than 200 employees) and for some small indirect Canadian acquisitions resulting from mergers and takeovers of foreign parent corporations. About 85 percent of all reviewable investment projects are covered by this abbreviated procedure. ^{1/} Regardless of the size of the proposed project, the application should be reviewed within 60 to 90 days from date of certification.

FIRA actions are summarized in table 24. Approval rates for both new business investments and acquisitions increased in 1983 after dropping in 1982. The data indicate that most applications for review still come from the United States, and that the approval rate increased from 1982 to 1983, after declining between 1981 and 1982.

Table 24.--Canada: Summary of actions taken by the Canadian Foreign Investment Review Agency on applications from the United States and Western Europe for investments in Canada, fiscal years, 1981-83

Type of application	(In percent)					
	United States			Western Europe		
	1981	1982	1983	1981	1982	1983
Acquisitions in Canada:						
Share of applications-----	63.6	58.0	63.7	30.6	34.6	28.1
Approval rate-----	84.4	74.0	91.6	87.8	84.9	88.0
Share of value of assets----	74.2	64.1	47.7	23.1	25.7	34.0
Investment in new business						
in Canada:						
Share of applications-----	52.9	57.3	57.0	38.4	27.7	31.5
Approval rate-----	90.1	66.4	78.4	89.3	77.2	84.6
Share of value of assets----	29.4	19.6	7.6	47.9	30.5	18.8

Source: United States International Trade Commission, Operation of the Trade Agreements Program, 34th and 35th Reports, 1983 and 1984.

^{1/} Ibid. p. 10-11.

The above figures do not account for any discouragement factor that may result from the FIRA screening process itself. This factor was recently examined by the Conference Board of Canada in a survey of potential investors. 1/ Of 21 investment criteria rated in the survey, 9 were considered as positive factors in the assessment of the Canadian investment climate, 10 others were believed to be neutral in their impact, 2/ and only 2 were assessed as having a negative impact on the thinking of potential investors. These two were government regulations in Canada and foreign investment controls. When commenting on the adverse effects of these factors, foreign investors frequently cited the National Energy Program (NEP) and FIRA. 3/

The fact that Canada has come to be viewed as less inviting to foreign investors has been recognized by the leadership of the new government. After campaigning to make investors more welcome in Canada, the new government went on record as wanting to distinguish its position on foreign investment from that of the previous government. Joint ventures and industrial partnerships with foreign companies and entrepreneurs were to be encouraged.

Investment Canada.--In December 1984 new legislation was introduced into Parliament to change the name of FIRA to Investment Canada. The new name is to underscore the agency's new mandate to encourage investment. Its role is intended to be positive rather than restrictive in order to emphasize the Government's efforts to foster and encourage investment. The new agency will continue to review major investment proposals of national economic significance. It will also assume the more positive role of facilitating "job-creating investment" and assisting in identifying new ideas, new technologies, and new export in investment opportunities for Canada. 4/ Priority sectors where increased capital investment is expressly desired are: energy, rail transportation, applied technology, and basic infrastructure.

The Investment Canada Act exempts all new investments from Canadian Government review and raises the threshold value for exemption of takeovers of Canadian companies from \$3 million to \$5 million. The legislation should result in faster, simpler decision-making, with the total number of investments subject to review being reduced by 90 percent. The basic criterion of determining whether proposed investments are of "significant" benefit to Canada has been altered. The new legislation requires only that a proposed investment be of "net" benefit to Canada.

1/ A Fit Place for Investment? The Conference Board of Canada, Study No. 81, Ottawa, 1984.

2/ Of interest to the focus of the present study, Canadian Government incentives, and taxation factors were deemed "neutral" in their impact on investors' decisions.

3/ A Fit Place for Investment? The Conference Board of Canada, . . . , p. 68.

4/ From a Sept. 25th address by Minister for International Trade James Kelleher to the Canadian Chamber of Commerce. The emphasis on job-creation is in keeping with the Government's assessment that unemployment represents Canada's "most critical national challenge". The rate of Canadian unemployment is currently 11.8 percent.

Discriminatory government procurement

In 1981, the value of Canadian Government procurement (Federal, Provincial, and Crown Corporations 1/) was about US\$25 billion. 2/ As a signatory to the GATT Government Procurement code, the extent Canada chooses to open up its official purchases to international bidding is a function of the number of specific entities it has agreed to subject to the agreement. 3/ Prior to its 1981 adherence to the code, Canada explicitly discriminated against foreign purchases by government entities in order to encourage the purchase of Canadian labor and materials. The reforms occasioned by the GATT code resulted in the elimination of a number of discriminatory purchasing practices by specific Federal agencies. Canadian entities not covered by the terms of the code include Crown Corporations, all Provincial and local governments, and the Ministries of Transport, Defense, Communications, and Fisheries and Oceans. 4/ When the purchases of the excluded entities are removed, 20 percent of Government purchasing is covered by the GATT code. Of the US\$3.5 billion in Federal Government procurement of goods and services in 1982, only US\$425 million (or 12 percent) fell within GATT code coverage.

"Buy Canada" policies are estimated to cover the remaining 80 percent of Government purchasing. 5/ Such policies operate via the following principles: priority sourcing--a hierarchy of suppliers is established according to the extent of their business presence in Canada; premium for Canadian content--in determining the lowest bidder, products with a higher domestic content are allowed a minimum price differential; the Procurement Review Mechanism (discussed below); the "Canadian Labor and Materials" clause by which contractors for government projects are enjoined to maximize Canadian content to the full extent procurable; and restricted purchasing.

In 1980, the Federal Government established a Procurement Review Mechanism for purchasing goods and services, valued at more than \$2 million, and construction projects, valued at more than \$10 million. One of the stated objectives of the review is "to concentrate initially on industrial benefits, particularly in the electronic and other high-technology sectors." Thus, the made-in-Canada procurement policy is aimed specifically at electronic and other high technology sectors. The review may result in a sole-source award to a Canadian company, a commitment for a greater amount of subcontracting within Canada, or "offsets," that is, contractual provisions under which a foreign supplier is required to spend a certain amount of funds in Canada (e.g., parts purchases, R&D expenditure, and the establishment of a service network).

1/ A Crown corporation is a government-owned commercial or industrial enterprise.

2/ Government Procurement Opportunities-Canada, U.S. Department of Commerce, International Trade Administration, 1983.

3/ The terms of the Government Procurement code are only binding on the specific government entities that national governments include in an appendix to their acceptance of the agreement.

4/ "Buy Canada" preferences are applicable to sales of goods and services to those Canadian entities not covered by the code.

5/ Government Procurement Opportunities-Canada, . . . , ITA booklet, p. 11.

Other avenues by which discriminatory government procurement takes place in Canada involve: (1) provincial policies, (2) FIRA review, and (3) the NEP.

A number of the Provinces have adopted either buy-Canada or buy-provincial policies. 1/ Quebec has a buy-provincial program that includes price preferences for provincial suppliers. 2/

Formerly, FIRA review and eventual approval of access to Canadian market opportunities could be subject to a formal written commitment on the part of the foreign investor to use domestic sources of supply. As mentioned previously, this tactic has been alleviated through the GATT. Nonetheless, strong encouragement may still be given for using domestic suppliers, and it remains part of the investment approval criteria.

Under the National Energy Program (NEP, discussed in greater detail in the section on petroleum/gas), the Government seeks to achieve majority Canadian ownership by 1990 in the oil and gas industry--presently dominated by foreign firms. According to Government policy, the attainment of this objective should provide more opportunities for Canadian manufacturers, contractors, and service companies. To promote Canadian ownership, the Committee on Mega-project Industrial and Regional Benefits (C-MIRB) was established in 1981 under the Department of Regional and Industrial Expansion to review purchases of energy projects operating on Canadian territory. Among the stated objectives of the C-MIRB programs are the following:

- (1) Increased sourcing of equipment and services in Canada, emphasizing sources that have a significant amount of value-added and technological and innovative input by Canadians;
- (2) Maximum participation and development of Canadian labor and management in all levels of operations in major projects in Canada;
- (3) Increased participation in major projects by firms owned and controlled by Canadians; and
- (4) Increased export mandates for foreign-owned manufacturing and service companies operating in Canada.

1/ "Ontario is encouraging the maintenance of a common market among the provinces protected by discriminatory domestic procurement practices. It sees provincial barriers to trade within Canada as counterproductive and suggests that the provinces encourage Canadian sourcing in general. Ontario provides a 10% procurement preference for Canadian goods. . .". Morici, Smith and Lea, op. cit., p. 72.

2/ Other such policies are favored by British Columbia, the Maritime Provinces (New Brunswick, Nova Scotia and Prince Edward Island), and Newfoundland.

Since the recent election in Canada there has been a noticable movement away from some of the objectives of the NEP. It is too early to see whether official comments will eventually be translated into legislative proposals.

Tax Policy

The Canadian tax structure includes special incentives for certain sectors of the economy. There are five principal incentives:

- (1) A special reduced base tax rate of 40 percent (instead of 46 percent) for manufacturing and processing, which is administered at a 30 percent rate in order to allow for provincial taxes. The value of this incentive in 1981 was \$472 million.
- (2) An investment tax credit on capital expenditure for plant, machinery, and equipment which is usually 7 percent but varies by region. The credit can be as large as 50 percent in a few economically depressed areas. The Canadian credit, in contrast to the U.S. investment tax credit, covers expenditure for plant.
- (3) A 20-percent credit for research and development expenditure by large corporations and a 35 percent credit for small businesses. In some regions, large corporations can qualify for a 30-percent credit. The portion of R&D expenditure which remains after the tax credit is fully deductible. Currently, firms are allowed to sell these R&D tax credits. The tax savings from the investment and R&D tax credits ((2) and (3) above) was \$722.5 million in 1981.
- (4) An accelerated depreciation deduction. This is a standard three-year depreciation of 25 percent, 50 percent, and 25 percent. Before 1982, the depreciation schedule was 50 percent in both the first and second years. The tax savings in 1981 due to accelerated depreciation was \$1.59 billion.
- (5) A special tax rate of 25 percent for the first \$200,000 in corporate income earned by Canadian-controlled enterprises. Any income in excess of this amount is taxed at the regular rate. The benefit from this concession accrues mainly to small businesses. In 1981, the overall tax savings from this reduced rate was \$1.30 billion. 1/

In 1981, \$7.9 billion in Federal taxes and \$3.3 billion in Provincial taxes were collected.

Without allowing for deductions and tax credits, the average base tax rate on income for corporations engaged in manufacturing and processing is 43 percent, inclusive of provincial taxes. Provincial taxes do range considerably, however. In 1984, Provincial corporate income tax rates ranged

1/ Firms that qualify entirely for the 25 percent small business rate are usually in services such as retail trade.

from 16 percent in Manitoba, Newfoundland, and British Columbia to 5.5 percent in Quebec. ^{1/} The effective tax rate does not differ substantially for small and large firms after allowing for tax credits and deductions.

Some Crown corporations are exempt from taxes. In addition to manufacturing and processing firms, the investment tax credit applies to firms engaged in oil, gas, and mineral exploration and certain agricultural activities. Energy firms are also entitled to a variety of other tax incentives.

Financial System

All banks operating in Canada must be chartered by Parliament according to the terms of the Bank Act that initially passed in 1871 with a 10-year finite duration included in each successive revision. The act regulates the relationship of the chartered banks to the public, the Government and to the central bank, the Bank of Canada. The commercial banking system consists of 11 private banks, ^{2/} all chartered by the Government. The five largest of these currently hold 88 percent of the assets of the commercial banking system. The small number of chartered banks would indicate a much greater level of concentration than in the U.S. banking system. ^{3/} In 1978, total assets of chartered banks amounted to \$189 billion. The value of total chartered bank loans was \$67.8 billion. Sixteen percent of this amount consisted of loans to Canadian industry. The sectoral breakdown of these loans is given in the following tabulation:

Industry	Value	Percent of total
	-----Million dollars-----	-----Percent-----
Chemical and rubber products-----	536.6	5.0
Electrical apparatus and supplies-----	430.7	4.0
Foods, beverages and tobacco-----	1,301.7	12.0
Forest products-----	989.5	9.2
Furniture-----	241.1	2.2
Iron and steel products-----	1,672.8	15.5
Mining and mine products-----	1,226.2	11.3
Petroleum and products-----	1,832.2	16.9
Textiles, leather and clothing-----	721.7	6.7
Transportation equipment-----	589.8	5.5
All other-----	1,270.0	11.7
Total-----	10,812.4	100.0

^{1/} The low corporate tax rate in Quebec is somewhat offset by a personal tax rate of 79.4 percent, a rate considerably above the Canadian average. Autumn Pre-Budget Statement 1983 (Toronto: Treasurer of Ontario and Minister of Economics, 1983), App. C, p. 48.

^{2/} The Bank of Montreal, The Bank of Nova Scotia, The Toronto-Dominion Bank, Banque Nationale du Canada, Canadian Imperial Bank of Commerce, The Royal Bank of Canada, The Mercantile Bank of Canada, Bank of British Columbia, Canadian Commercial and Industrial Bank, Northland Bank, and Continental Bank of Canada.

^{3/} However, the 11 chartered banks operate through a network of 7,455 branches in Canada and 290 offices abroad.

The latest revision of the Bank Act, approved in June 1984, allowed the ceiling for foreign banks operating in Canada to double from 8 percent to 16 percent of the Canadian dollar amounts of the banking system.

The 1967 Bank Act imposed restriction on foreign banks, preventing their being established as chartered banks but not precluding their undertaking other types of financial activity. In the Bank Act of 1980, a ceiling was placed on the operation of all foreign banks in Canada: rather than being limited to 15 percent of the total commercial lending, they were held at 8 percent of the total domestic assets of all banks in Canada.

Canadian economic development policies that offer specific Government financial assistance fall into one of three categories: incentive programs, export financing, or nationalization of key industries.

Incentive programs

Programs, other than tax breaks, which provide financial assistance to Canadian firms usually consist of incentives directed toward achieving a desired economic policy objective. These objectives can range from locating industries in needy areas to stimulating innovation in promising industries. However, these programs do not usually focus on specific sectors, but instead attempt to improve the overall business climate.

Industrial and Regional Development Program (IRDP).--The major Canadian economic development effort is the IRDP which began in July 1983. Seven programs with a combined budget of \$350 million were subsumed into the IRDP. ^{1/} Regional development incentives are the purpose of this program since the amount of possible assistance depends on the geographical location of the project. For the IRDP, the country is divided into 260 Census divisions, each division assigned to one of four tiers, and each tier is eligible for differing amounts of aid. Tier I gets the most help; Tier IV gets the least. The percentage of the population in each tier is as follows (in percent):

Tier I-----	50
Tier II-----	30
Tier III-----	15
Tier IV-----	5

The IRDP has six program elements, each designating a type of project eligible for IRDP support, and each having distinct criteria for eligibility, levels of support, and methods of support. The program elements are innovation, modernization/expansion, marketing assistance, establishment of new businesses, restructuring of existing businesses, and the industrial development climate. Most of the funds go to small- and medium-sized companies for the elements of modernization and expansion and new businesses.

^{1/} They were the Enterprise Development Program (EDP), Support for Technology Enhanced Productivity (STEP), Co-operative Overseas Market Development Program, Institutional Assistance Program, the Regional Development Incentives Program, Montreal Special Area Program, and the Magdalen Islands Special Area Program.

A third popular category is innovation in developing new products and processes. Assistance typically is provided through loans and contributions. Participation loans, whereby the Ministry of Regional and Industrial Expansion receives stock options or a royalty on sales in return for supplying funds, can be used when the purpose of the assistance is to establish a new facility or to help firms in financial difficulty restructure their product line and manufacturing processes.

Fifteen regional offices administer this program and make most of the project approval decisions. The criteria used in determining recipients of assistance are not well-defined, but particular emphasis is given to "projects, industries and technologies with the greatest potential for economic return, sustained growth, and international competitiveness." ^{1/} Industries receiving the largest number of assistance offers under IRDP include food processing, lumber, machinery, electronics, and metal-fabricating. ^{2/} The IRDP budget for 1983/84 was \$102.7 million, and is slated to be \$110.2 million for 1984/85. ^{3/}

Federal Business Development Bank (FBDB).--The FBDB is a Crown corporation that supplies both capital and technical assistance to firms that can demonstrate a reasonable expectation for a venture's success; and at the same time, obtain some funding from sources other than FBDB. The forms of assistance include: loans, loan guarantees, equity financing, leasing, technical services, such as management counseling and training, ^{4/} or combinations of these. From the inception of the FBDB in 1944 until 1961, loans were made only to small- and medium-sized manufacturing businesses. In 1961, the Bank was allowed to loan to any type of business. Individual loans currently average about \$200,000, but are never more than \$10 million. Total direct loans or guaranteed loans were almost \$900 million in 1981. At present, about 80 percent of FBDB's loan portfolio is in nonmanufacturing businesses. The major manufacturing industries receiving aid in 1981 were food and beverages, wood products, and iron and steel products (including machinery and equipment). Nonmanufacturing sectors receiving loans included transportation (other than air), construction, industrial buildings, wholesale and retail trade, restaurants, agriculture, and hotels and motels (table 25). ^{5/}

^{1/} Industrial and Regional Development Program, Annual Report 1983-84, Government of Canada, Department of Regional and Industrial Expansion, p. 1.

^{2/} Ibid., p. 15.

^{3/} "The Government of Canada's Support for Technology Development, 1984," Ministry of State, Science and Technology Canada, p. 10.

^{4/} The FBDB publishes booklets on a wide range of topics of interest to Canadian business. Among these is a series entitled ABC (Assistance to Business in Canada) 1984 [AIDE (Assistance et information pour le développement de l'entreprise) 1984]. The series consists of a number of handbooks explaining Federal assistance programs available to the Canadian business community. Each handbook includes a supplement of provincial or territorial assistance programs.

^{5/} Morici, pp. 53-4.

Table 25.--Canada: FBDB loans authorized, by type of businesses
fiscal years 1982-84
(In thousands of dollars)

	1982	1983	1984
Manufacturing-----	132,789	86,402	76,746
Wholesale and retail trade-----	95,583	64,295	61,426
Tourist industry-----	109,741	109,504	90,755
Agriculture-----	9,323	6,500	6,367
Construction-----	20,300	20,429	9,445
Rental properties-----	43,569	33,839	32,991
Transportation and storage-----	21,416	17,745	10,975
All other-----	43,252	31,763	32,467
Total-----	475,973	370,477	321,172

Source: Annual Reports, 1982-84, Federal Business Development Bank, Montreal.

The Canadian Industrial Renewal Board (CIRB).---The CIRB was established in 1981; its lending efforts are aimed at specific industrial sectors: textile, clothing, knitting, footwear and tanning, referred to as TCF industries, in 7 areas--5 in Quebec and 2 in Ontario. The seven areas are all dependent on the TCF industries. Two programs have been designed to address the different needs of each facet of the CIRB mandate.

The CIRB program would appear to be directly responsive to OECD calls for positive adjustment strategies in the Canadian TCF industries. The program was established for 5 years with a budget of \$267 million. ^{1/} The program is due to expire in March 1986.

The Board is responsible to the Minister for Regional Industrial Expansion. The Board's mandate is to promote the revitalization of the TCF industries, promote the strengthening and diversification of the economic base of regions heavily dependent on the TCF industries, and assist workers displaced as a result of industrial adjustment in those industries. To accomplish these goals, two programs have been established within CIRB: the Sector Firms Program (SFP) and the Business and Industrial Development Program (BID).

The Sector Firms Program (SFP) provides loans, loan guarantees, grants, and financial assistance for studies to TCF industries. One element of the SFP is a merger/acquisition feature by which existing TCF firms are encouraged to band together to become stronger through economies of scale. This feature of the program has not been used in the 3-year existence of the CIRB.

^{1/} This has since been supplemented, and the 5-year budget envelope amounts to \$345 million.

The Business and Industrial Development Program is a targeted regional program to attenuate the negative effects of declining TCF industries in specified geographic areas. BID will not assist TCF firms directly. Rather, its program of contributions, direct loans, and loan insurance is open to non-TCF firms in the special areas and to non-TCF firms willing to set up in a special area affected by declining TCF firms. BID is a little more generous than the IRDP in terms of the levels of assistance it provides. These are usually equal to the assistance provided under Tier 3 of the IRDP. There is no overlap between IRDP and the CIRB programs because IRDP managers refer CIRB-type cases to the CIRB. If a project is eligible for assistance under CIRB regulations, it cannot be examined by the IRDP.

Small Business Loan Program (SBLP).--The SBLP, operated by the Department of Regional Industrial Expansion guarantees loans of up to \$100,000 and provides technical services such as management assistance. Eligible applicants must have annual sales of less than \$1.5 million, and the funds are typically used to finance equipment procurement, construction or renovation of facilities, or to purchase land. The program is administered through Canadian charter banks with the Government acting as the guarantor. The rate of interest on SBLP loans was adjusted in 1978 to the prime rate plus 1 percent--a rate usually below that available on the commercial market to the constituents of the program. Since the 1978 modification, loan activity has increased considerably.

The following tabulation presents financial information on the various incentive programs open to Canadian firms. 1/

<u>Program</u>	<u>Year</u>	<u>Annual expenditure (million dollars)</u>
FBDB-----	(1983 and 1984)	321
IRDP-----	(1983 and 1984)	111
CIRB-SFP-----	(1982 and 1983)	89
-BID-----		<u>27</u>
Total-----		545

Provincial Incentive Programs

The Provinces in Canada are more autonomous than the States in the U.S. Federal system. For example, in resource-endowed Canada, the Provinces have traditionally owned the natural resources in their territory. Consequently, production of timber, petroleum, natural gas, and minerals is often controlled or at least heavily regulated by Provincial governments.

1/ Export Development Corporation, Annual Report, 1983, p. 10. This figure represents paid-in equity by the Government during 1983. Industrial and Regional Development Program, Annual Report 1983 and 84, p. 16. The estimated assistance of \$82.6 million which covers the 9-month period from the inception of the program in July 1983 through Mar. 31, 1984, has been annualized. Canadian Industrial Renewal Board, Second Annual Report gives the funds committed to the Sector Firms Program (SFP) and the Business and Industrial Development Program (BID).

Because of the importance of the provinces in the Canadian federation, an examination of industrial targeting in Canada cannot overlook provincial programs to stimulate and assist industry. Since the interests of the provinces are more narrow and easily focused, they--more than the Federal Government--would appear to be the logical focal points for the adoption of industrial targeting strategies in Canada. The Provinces are less encumbered by the need to balance both regional and sectoral interests in fashioning incentive programs. Table 27 shows that two Provinces, Ontario and Quebec, together account for nearly two-thirds of the personal income produced in Canada. 1/ These two Provinces are examined more closely below.

<u>Province or territory</u>	<u>Personal income, 1979</u>	<u>Percent of total ^{2/}</u>
Newfoundland-----	3,023	1.6
Prince Edward Island-----	680	.4
Nova Scotia-----	5,422	2.9
New Brunswick-----	4,159	2.2
Quebec-----	47,929	25.4
Ontario-----	73,770	39.0
Manitoba-----	7,702	4.1
Sashatchewan-----	7,046	3.7
Alberta-----	16,410	8.7
British Columbia-----	22,224	11.8
Yukon and Northwest Territories-----	491	.3
Foreign <u>1/</u> -----	<u>158</u>	<u>.1</u>
Total-----	189,014	100.0

1/ Canadians living abroad.

2/ Because of rounding, figures may not add to the totals shown.

Ontario

The Ontario Provincial government is heavily concerned with improving the economic climate within its domain and within the entire country. The Board of Industrial Leadership and Development (BILD), Ontario Development Corporation, Ontario Energy Corp., and Ontario International Corp. provide seed money for a variety of projects aimed at technological advancement, export growth, and increased self-sufficiency for raw materials.

The Board of Industrial Leadership and Development (BILD) currently has a \$502 million annual budget directed toward infrastructure and business development in Ontario. In addition to providing funds for projects such as building roads and upgrading transportation facilities, BILD has established the IDEA Corp. which provides badly needed venture capital for provincial enterprises. According to its proposed budget, IDEA Corp. will invest \$107 million between 1980 and 1985 with \$65 million earmarked for high technology in the five areas: biology, chemistry, computers, machinery, and microelectronics. Under another BILD project, six technology centres have

1/ Canada Year Book 1980-81, table 23.6, p. 865.

been opened: microelectronics in Ottawa, CAD/CAM (computer-aided design/computer-aided manufacturing) in Cambridge, robotics in Peterborough, auto parts in St. Catharines, resource machinery in Sudbury, and farm machinery and food processing in Chatham. In Ottawa, staff at the microelectronics centre provide chip design, production, and testing assistance. The CAD/CAM and robotics centres attempt to take new technology to the shop floor, aiming particularly at small firms which compete internationally. The Peterborough centre was established in coordination with General Electric of Canada which has considerable expertise in robotics. The aim of the Sudbury centre is more toward identifying potential market opportunities for Canadian manufacturers of resource machinery, thereby eliminating import penetration into the Canadian market and establishing an export market for such equipment. BILD's commitment to these technology centres will total \$110 million in the 5-year period 1980-85.

BILD has also joined the push for a viable Canadian biotechnology industry through a combined investment in Allelix, Inc., along with Canada Development Corp. and John Labatt, Ltd. In the energy field, BILD has provided funds for nuclear power projects and has tried to improve electrical transmission systems. With Ontario Hydro's current debt in excess of \$1 billion, the Province may be hoping that the United States will purchase some of the electricity that results from this increased capacity.

The Ontario Energy Corp. (OEC) is a nontaxable investment corporation established in 1975 by the provincial government with an initial equity of \$100 million. The corporation is a unique combination of public and private enterprise, operating like a private investment company within policy parameters established by the Government of Ontario. The OEC finances its own administrative costs, and is responsible to an independent Board of Directors. The Minister of Energy is the sole shareholder. All but two of the corporation's investments are in partnership with private companies. OEC invests primarily through three subsidiaries: Ontario Energy Ventures Limited (OEV), which is active in energy technology investments; Ontario Energy Resources Ltd. (OERL), which is the holding company for the corporation's 25-percent interest in Suncor Inc.; and Onexco Oil & Gas Ltd., which invests in oil and natural gas exploration and development ventures. These energy projects can be located anywhere within Canadian territory. The corporation does not provide subsidies or grants. In 1983, the Government of Ontario's contribution to OEC was \$79.1 million. 1/

1/ OEV has engaged in projects such as developing energy and fuel from waste materials, producing ethanol from wood residues through microbiological fermentation techniques, developing a residential wood pellet burning furnace for heating, and building natural gas pipelines in the frontier exploration areas. Suncor Inc. has invested heavily in an oil sands plant at Fort McMurray, in expansion of its oil sands mine, and in upgrading its Sarnia refinery through construction of a hydrocracker and other improvements. This heavy investment by Suncor has made a definite impact; its oil sand production rose by 41 percent in 1983. Onexco Oil and Gas and Suncor also have jointly formed the Trillium Exploration Corp.. Trillium planned to spend \$220 million from 1982-87 on exploration and development of Canada's frontier energy resources. Its current exploration projects are located in the Mackenzie Delta and Beaufort Sea, the Arctic Islands, and offshore Newfoundland, Nova Scotia, and Labrador.

The Ontario Development Corp. (ODC), Northern Ontario Development Corp. (NODC), and Eastern Ontario Development Corp. (EODC) all provide financial assistance in the form of loan guarantees, term loans, and lines of credit for the establishment and expansion of secondary manufacturing industries, for services closely allied with secondary manufacturing, and for tourism operations and attractions.

ODC, NODC, and EODC projects are mainly aimed at small businesses, and loans usually range between \$5,000 and \$500,000. The average loan is less than \$100,000. Overall lending by the three corporations totaled \$94.3 million in 1982 and 1983.

Eligible projects include building construction and purchase, purchase of production equipment, initial commercial production runs for products involving new technology, purchase of foreign-owned Ontario-based companies, and purchase of pollution-control and energy-saving equipment.

These companies also administer an export support program for Ontario manufacturers that cannot obtain financial assistance elsewhere. This program, designed to lessen the cash-flow problems of small Canadian exporters, provides for a line of credit of up to 90 percent of the value of receivables due from export transactions. In fiscal year 1982-83, one-half of the 250 firms receiving this type of aid had 20 employees or less. The export support program is partially funded by BILD.

BILD's High-Technology Loan Program, an undertaking that assists the growth of small Canadian firms involved in technology-intensive fields, is processed through the three ODC's. This program will provide \$50 million in loans in 1980-85.

In October 1983, Ontario launched its Export Success Fund. This fund provides matching expenditures for companies engaged in researching a new export market for their products. The money can be used for on-site evaluation of the potential market, modifying or repackaging a product, or developing a merchandising program. Aimed at small businesses, the maximum allocation is \$35,000 per firm. A second part of the fund, administered by the Ontario International Corp., provides a maximum \$50,000 loan to groups like consulting engineers, architects, contractors, and manufacturers of capital equipment for studies aimed at winning work on foreign capital projects. From November 1983 through 1984, the budget for the Export Success Fund is \$5 million.

The Ontario International Corp. (OIC) is the primary international marketing agency for the Ontario government. Founded in 1980, it also helps Ontario firms identify and exploit opportunities in the \$110-billion-a-year market for capital projects. These projects, many in newly industrialized and resource-rich countries, include contracts to design, engineer, build, and operate public facilities such as roads, bridges, power plants, hospitals, and universities. OIC promotes the involvement of Ontario consultants and contractors, indirectly supports the sale of related capital goods, and provides government-to-government contacts. In fiscal year 1982-83, OIC generated fee and product income of \$27.5 million for its clients.

The corporation will actually find projects for Ontario clients and look for partners when joint ventures are needed. Additionally, OIC introduces local firms to international development banks and brings potential customers to Ontario so they might assess the capabilities of Ontario firms for handling specific projects. Although it does administer programs like the Export Success Fund, OIC has no funds of its own for disbursement.

Ontario also has a program designed to encourage equity investment in small businesses. Individuals and corporations may invest in Small Business Development Corp. (SBDC), which funnel money into firms located within the province. The Provincial government gives individuals a grant equal to 30 percent of their SBDC investment, and corporations receive an Ontario income tax credit of 30 percent on their equity contribution. Through this program and BILD projects such as IDEA Corp., Ontario's concern with maintaining adequate sources of venture capital is self-evident.

Finally, the Ontario Research Foundation (ORF) provides materials analysis, specifications testing, and other specialized engineering services to firms on a contract basis. The largest independent contract research laboratory in Canada also aids in the transfer of technology from Government laboratories to industry. Its services are closely interrelated with the Federal Industrial Research Assistance Program (IRAP), administered by the National Research Council. During 1980, one in three Ontario manufacturers with over 100 employees used the foundation. ORF will aid in product development and all resulting patents are assigned to the client. The Government contribution to ORF is small, totaling only \$4 million in 1984.

Quebec

In 1979, the Province issued a statement of industrial policy, Challenges for Quebec. 1/ This was followed in May 1982 by a more detailed program of action, Technological Change. These documents outlined the Provincial government's strategy for economic development and reflect the political philosophy that State planning and guidance have a direct role in the proper development and operation of the Provincial economy.

There are two major Provincial programs of assistance in Quebec: Société de développement industriel du Québec (SDI) 2/ and Société générale de financement du Québec (SGF). Both are Crown Corporations responsible to the provincial Department of International Trade and Commerce.

QIDC (SDI) was created in 1971 and remains the Province's principal tool in providing investment assistance to the private sector. 3/ QIDC is intended to be a one-stop agent for provincial assistance programs, and in FY 1984 it disbursed over \$485 million in official aid to small- and medium-sized businesses in Quebec. QIDC financing takes the form of loans, grants, loan guarantees or equity participation. The number of firms aided and the amounts received in 1983-84 is shown below: 4/

1/ Challenges for Quebec, a statement on economic policy (Quebec: Ministry of State for Economic Development, 1979).

2/ Hereafter referred to as QIDC, the Quebec Industrial Development Corporation.

3/ Challenges for Quebec, p. 44.

4/ Annual report 1983-84, QIDC, p. 21.

	<u>Number</u>	<u>Amount</u> <u>(\$1,000 dollars)</u>
Loans-----	107	28,398
Grants-----	390	76,335
Equity participation-----	6	744
Loan guarantees and other-----	<u>303</u>	<u>79,833</u>
Total-----	806	185,310

QIDC administers six programs covering a broad range of official assistance:

Investment Assistance Program for Manufacturing Companies
 Financing Program for Manufacturing Companies
 Investment Assistance Program for Research Laboratories
 Assistance Program for Research and Development
 Assistance Program for the Electronics Industry
 Program for Exports

The only sector-specific program currently active is for the electronics industry. Sectors that previously received QIDC assistance included textiles, clothing, and footwear. The annual report provides a sectoral breakdown of the 1983-84 disbursements. Of 26 sectoral groupings, the following 10 covered 70 percent of the annual authorizations of the group: 1/

<u>Sector</u>	<u>Amount</u> <u>(\$1,000 dollars)</u>
Electrical equipment-----	21,420
Machinery-----	19,522
Lodging and restuarants-----	17,502
Metal products-----	13,929
Wood products-----	12,553
Food and drink-----	10,098
Chemical products-----	9,546
Transportation equipment-----	8,778
Furniture-----	8,671
Other manufacturing-----	<u>8,190</u>
Total-----	130,209

Another major Quebec entity for providing official support is SGF (Société générale de financement). SGF is an industrial holding company, not a financial institution. It provides equity participation in certain companies--either alone, or preferably in association with private companies. The capital stock of SGF is owned by the Province of Quebec, which has decided that SGF operations will be limited to only five industries: forest products (pulp, paper, etc.), energy-related products (e.g., turbines generators, boilers, etc.), biotechnology, petrochemicals, and aluminum. This limitation on the scope of SGF operations is intentional: industries of importance to Quebec are focused on. To go into any new industry would require Government approval. SGF receives no other direction from the province. It attempts to develop centers of advanced technology and to remain attuned to opportunities that will enhance the operation of the specific industries in which it is authorized to participate. The assets of SGF at yearend 1983 were valued at \$1.03 billion; consolidated sales of the companies managed by the SGF Group

1/ Annual report 1983-84, QIDC, p. 23.

for the same period equaled \$853 million. Net earnings for the year amounted to \$5.3 million, a striking turnaround from the \$10.4 million loss for 1982. The biggest factor affecting this change was the improved performance of the forest products sector July-September 1983.

Although the provinces have made attempts to direct public resources along promising industrial lines, no concerted effort in this direction is apparent. ^{1/} The efforts that have been mounted are often the result of inaction at the Federal level.

Export financing

The Export Development Corp. (EDC) was established as a Crown corporation in 1968 to promote Canada's trade, as does the U.S. Export-Import Bank. ^{2/} Financial services offered by the EDC include loans and lines of credit for purchasers of Canadian exports, loan guarantees, and insurance against production risk, political risk, buyer default, and wrongful calls of performance bonds. The corporation raises funds internationally in order to avoid exerting upward pressure on interest rates in Canada. EDC financing aids about 5 percent of Canadian exports. This statistic contrasts with 8 percent in the United States and 49 percent in Japan. ^{3/} Table 26 presents a summary of EDC's financial activities for 1982 and 1983, while Table 27 presents a breakdown of the sectors receiving financial assistance in 1983.

Table 26.--Canada: EDC Financial activities, 1982 and 1983

(In million of dollars)				
Item	:	1982	:	1983
	:		:	
Transactions financed by EDC-----	:	2,407.8	:	891.3
Bank loans guaranteed by EDC-----	:	-	:	5.7
Lines of credit signed-----	:	381.6	:	234.6
Loan disbursements made-----	:	1,215.6	:	1,047.5
Insurance and guarantee instruments issued--	:	2,345.3	:	3,896.8
Buyer credits approved-----	:	709.3	:	879.2
Claims paid-----	:	9.1	:	32.6
	:		:	

Source: Export Development Corporation, "Statistical Review-1983", p. 2-4.

^{1/} A Canadian study has concluded: "No Canadian provincial government has followed a consistent strategy of concentrating its economic development efforts on industries thought to have particularly good prospects of growth." Targeting High-Growth Industry, Roy George (Montreal: The Institute for Research on Public Policy, 1983), p. xi.

^{2/} The EDC "seeks to enhance the economic benefits of exports and to further the interests of Canada by assisting in improving Canada's balance of payments, by optimizing the Canadian content of exports, and by complementing government trade policy."

^{3/} C. C. Pentland, "Domestic and External Dimensions of Economic Policy: Canada's Third Option," in Economic Issues and the Atlantic Community, Wolfram F. Hanreider, ed., (New York: Praeger, 1982), p. 151.

Table 27.--Canada: EDC: Exports insured and guaranteed,
by commodity groups, 1983

(In million of dollars)

Product group	Amount
Services-----	1,811.4
Forestry products:	
Wood fabricated materials-----	324.4
Wood pulp and similar pulp-----	198.2
Paper and paperboard-----	121.4
Crude Wood materials-----	8.7
Total-----	652.7
Minerals, metals, and chemicals:	
Crude nonmetallic minerals,	
Except coal and petroleum-----	161.4
Chemical products-----	134.0
Petroleum and coal products-----	84.2
Nonferrous metals-----	66.9
Other-----	118.1
Total-----	564.6
Other manufactured products:	
Building construction-----	206.5
Heating, air conditioning, and	
refrigeration equipment-----	29.1
Miscellaneous fabricated products-----	21.2
Electric lighting, distribution and	
control equipment-----	18.3
Prefab buildings-----	17.1
Furniture and fixtures-----	16.6
Other-----	77.7
Total-----	386.5
Machinery:	
Special industry machinery-----	107.2
Steam generators-----	37.5
General purpose industrial machinery-----	21.2
Other-----	17.2
Total-----	183.1
Textiles, related products,	
and consumer goods:	
Textile fabricated materials-----	38.4
Containers and closures-----	18.5
Leather-----	10.2
Printed matter-----	7.6
Personal and household goods-----	6.7
Other-----	29.9
Total-----	111.3

Table 27.--Canada: EDC: Exports insured and guaranteed,
by commodity groups, 1983--Continued

(In million of dollars)	
Product group	Amount
Transportation equipment:	
Railway and street railway	
Rolling stock-----	38.7
Road motor vehicles-----	34.5
Other vehicles-----	5.1
Ships and boats-----	3.3
Aircraft-----	2.2
Total-----	83.8
Agricultural and animal products-----	61.2
Electronic equipment-----	35.5
Grand Total-----	890.2

Source: "Statistical Review-1983," Export Development Corp., pp. 27 and 28.

Canadian content and credit worthiness are the two principal criteria in determining who receives support. To receive EDC financial aid, the exports must satisfy the minimum domestic content requirement of 60 percent. ^{1/} The EDC will finance at most 85 percent of the contract value. Direct loans are made to overseas purchasers of Canadian products. No direct loans are made to Canadian exporters, although loans made by commercial banks to exporters can be guaranteed by EDC. Exporters also are eligible for a variety of insurance services, including insurance against nonpayment of foreign accounts receivable.

Another official program for export development/promotion, although very small in comparison to the EDC, is the Program for Export Market Development (PEMD). This is aimed at assisting Canadian firms to avail themselves of export opportunities, to enter new markets, and to expand existing ones. The form of assistance is usually subsidized participation in trade fairs, export consortia, travel, and foreign-capital projects. A ceiling of \$50,000 per project is maintained under PEMD. The financial assistance provided under PEMD is in the form of a loan repayable only if export sales or an export contract results.

^{1/} Exceptions to this requirement are made for certain industries. Exports resulting from defense-sharing arrangements only need 50-percent domestic content. Also, certain auto pact exports are subject to a 50-percent minimum.

Marketing of Canadian exports is also aided by the Trade Commissioner Service, similar to the Foreign Commercial Service of the U.S. Department of Commerce. The Canadian Commercial Corp. assists Canadian firms in selling to foreign governments and international agencies. The Canadian International Development Agency (CIDA) promotes exports through its administration of tied-aid programs. CIDA oversees the official development assistance budget of over \$1 billion. In order to strengthen economic ties between Canada and the rapidly industrializing nations of the Third World, CIDA also operates an Industrial Cooperation Program, which focuses primarily on funding for project preparation studies, demonstration/test projects, and profitability and risk analyses.

Public ownership

Government ownership is more widespread in Canada than in the United States. This is so for a number of reasons, among them the preference for government ownership over government regulation, and a concern for maintaining employment in certain sectors. Economic nationalism also encourages public equity investment. The desire to gain or regain control of foreign-owned firms has resulted in a number of policy changes since the early 1970's.

Through the establishment of Crown corporations, the Canadian Federal and Provincial governments have become directly involved in the business sector. As of March 1984, there were 307 Crown corporations in Canada, a 5-percent increase since December 1982. This figure represents both wholly-owned corporations, subsidiaries, and joint and mixed enterprises. ^{1/} It has been reported that at least \$5.5 billion Canadian tax dollars went to support such entities in 1983. Over the last 20 years assets of Crown corporations, as a share of GNP, increased from 14.7 percent to 23.9 percent. ^{2/}

Although the Federal Government has found the policy of nationalization to be a viable, albeit undesirable, tool to reduce foreign investment, the provincial governments have been less hesitant to acquire companies from foreign investors. Two recent examples of this can be seen in the 1975 expropriation of the potash industry in Saskatchewan (40 percent of the world's known reserves) and in the 1981 takeover by Quebec of the Asbestos Corp. in which General Dynamics sold a stock majority to the Quebec Government under threat of expropriation. ^{3/} Crown corporations are more often newly formed corporations established by the Federal or Provincial governments, as opposed to existing corporations being expropriated or acquired by the Government. In 1974, PetroCanada was formed as a first step in the nationalization of the petroleum industry. ^{4/} PetroCanada has been aggressive in seeking out joint ventures for oil and gas exploration and for the development of synthetic hydrocarbons as well.

^{1/} For a complete listing of such entities see "Crown Corporations and other Canadian Government Corporate Interests," Treasury Board of Canada, 1984.

^{2/} Challenges and Choices, p. 36.

^{3/} Willis C. Armstrong, et al, Canada and the United States: Dependence and Divergence, op. cit., p. 115.

^{4/} Ibid. p. 116.

Federal and provincial ownership occur in a variety of industries. Eight provinces own their electric utilities and three own their telephone systems. Although governmental ownership at both levels is not large in the mining and manufacturing sector, it has been growing recently. Industries where public ownership is prominent include steel, pulp and paper, petroleum and natural gas, aerospace, and the aforementioned potash mining. In the steel industry, Sydney Steel is a provincially owned firm in Nova Scotia as is Sidbec in Quebec. To foster economic development and maintain employment, Newfoundland, Manitoba, Saskatchewan, and British Columbia have entered the pulp and paper industry. Oil and gas developments have been accelerated through the Ontario Energy Corp., SASKOIL (Saskatchewan), Alberta Energy Co., and the B.C. Petroleum Corp. (British Columbia). Federal ownership also occurs in the radio and rail industries, and provincial ownership is found in insurance and financial industries. 1/

In previous years, Crown corporations have been immune to antitrust prosecution unless statutes establishing them had a specific clause stating that they were subject to antitrust laws. With the antitrust reform measure before the last Parliament, a Crown corporation that competes with the private sector would no longer be exempt from antitrust laws.

The Canada Development Corporation (CDC) came about in the early 1970's as a result of the perennial concern in Canada with foreign ownership. The CDC was organized to promote the "development and maintenance of Canadian-owned and -managed corporations through equity investments." It has pursued this mandate by investing in sectors such as petrochemicals, mining, oil and gas, health care, electronics, fishing, and industrial automation. These activities have given support to the Canadian policy of increasing the share of domestically controlled natural resource processing and high-technology industries.

Throughout 1981, CDC continued to acquire companies to further the national aim. CDC purchased oil and gas properties from both French and American companies and established Canterra Energy Ltd. and Creek Mines Ltd. with these properties. CDC also entered the industrial automation, electronics, and biotechnology fields.

In May 1982, the Canadian Government established the Canadian Development Investment Corp. (CDIC) as a Federal holding company to oversee the operation of certain troubled Canadian companies. CDIC oversees the operation of Canadair, de Havilland, and Eldorado Nuclear, in addition to other Government investments including Teleglobe, Massey Ferguson, and Canada Development Corp. CDIC is also responsible for investments in three east coast fishing companies. 2/

1/ Earl H. Fry and L.H. Radebaugh, eds., Regulation of Foreign Direct Investment in Canada and the United States (Provo: Brigham Young University, 1983), p. 115.

2/ CDIC president Joel Bell has provided the rationale for the holding company's functioning: "The government is involved in the ownership of these companies in the first place because of their importance to Canada's industrial future. For this reason, we are expected to strive hard to find a way in which they can be made viable--and then profitable--if that is believed possible over the course of time." CDIC News Release, May 10, 1984, Ottawa, p. 2.

The long-term goal of CDIC was "to return control of its subsidiaries companies to the private sector when the commercial opportunity arises." ^{1/} The newly elected government announced in October 1984 that CDIC had been given a mandate to sell the Crown corporations which comprise its major assets. Although the combined assets of the companies are estimated to be as high as \$6 billion, it is unlikely that anything close to that amount will be realized by the liquidation of CDIC assets. CDIC has been given 6 months to a year to divest itself of its Crown holdings.

Science and Technology Policy

The Canadian Government supports science and technology principally through expenditures on both research and development (R&D) and training. Canadian expenditures on R&D, as a share of gross domestic product, have ranged between 0.99 and 1.27 percent in recent years. This contrasts sharply with the 2 to 3 percent range of other industrialized countries such as the United States, Japan, the Federal Republic of Germany, and Sweden. In 1981, R&D expenditures in the United States constituted 2.0 percent of the value of domestic industrial production and in Canada they were only 0.9 percent. ^{2/} The Government is trying to foster the funding of research through various projects. However, the Task Force on Federal Policies and Programs for Technology Development recently criticized several of these endeavors as ineffective. The report indicated that the Government is unsuccessfully trying to target industries through programs such as the Industrial and Regional Development Program (IRDP), Industrial Research Assistance Program (IRAP), Program for Industry and Laboratory Projects (PILP), Defense Industry Productivity Program (DIPP), and the Industrial Energy Research and Development Program (IERD). Instead of trying to pick winners, the task force concluded that the Government should provide assistance to planned projects largely through tax breaks. Future Government policy is likely to follow that approach.

Table 28 presents Canadian R&D expenditure levels for fiscal years 1983 through 1985, and table 29 shows R&D spending by sector among the major industrialized nations.

^{1/} Ibid., p. 3.

^{2/} Industrial Research and Development Statistics-1982, Statistics Canada, table 1.1, p. 21.

Table 28.--Canada: Federal expenditures on R&D, by performers, 1982-85

(In million dollars)

Performer	1982 and 1983		1983 and 1984		1984 and 1985	
	Amount	Percent	Amount	Percent	Amount	Percent
	: : Million : dollars	: : of total	: : Million : dollars	: : of total	: : Million : dollars	: : of total
Intramural-----	1,094	56.4	1,223	53.6	1,403	54.7
Industry-----	319	16.5	446	19.5	525	20.4
Universities-----	4,111	21.2	475	20.8	497	19.4
Foreign-----	82	4.2	86	3.8	88	3.4
Nonprofit						
institutions---	11	.6	23	1.0	18	.7
Provincial and						
municipal-----	4	.2	6	0.3	9	.3
Other Canadian---	17	.9	23	1.0	27	1.0
Total-----	1,939	100.0	2,282	100.0	2,566	100.0

Source: Science and Technology Statistics Division, "Federal Science Expenditures and Personnel 1984/85," table 13, p. 29.

Table 29.--Canada: International comparison of R&D spending, by principal funding sector, 1977 as a percentage of gross domestic product

Country	Government	University	Industry	Other	Total
Canada-----	.43	.13	.34	.04	.92
U.S.-----	1.22	.07	1.05	.05	2.39
France-----	.67	.10	.74	.28	1.79
Germany-----	<u>1/</u> .83		1.11	.06	2.00
Japan-----	.27	.19	1.12	.12	1.70

1/ Includes university spending.

Source: Morici, Smith and Lea, op. cit., p. 51.

As mentioned previously, Federal assistance to research and development is available through a variety of programs. Financing can take the form of contributions, loans, and equity sharing arrangements. Technical assistance is also available, however, in most cases it will only be given to firms based in Canada.

Several Federal programs are administered by the National Research Council (NRC). Among them, the Industrial Research Assistance Program provides a field advisory service and a technical information service. Contributions by IRAP are also made available under four categories: large projects, small projects, laboratory investigations, and technical projects that involve the hiring of college students. Under this program, NRC personnel in 21 centers across the country dispense advice and information on

industrial engineering techniques, help smaller firms solve specific technical problems, and make grants for specific laboratory investigations and for longer term applied research projects with large commercial market potential. The program contributes to over 300 projects each year. Table 30 provides a breakdown of the contributions of IRAP by industrial sectors. In fiscal 1984 and 1985 the total IRAP budget will amount to \$48 million.

Table 30.--Canada: Industrial Research Assistance Program
contributions, by industrial sectors, 1981

Industry sector	Total Support	
	Amount	Percent of total
	----1,000 dollars----	
Food and agriculture-----	5,530.6 :	22.3
Rubber-----	585.0 :	2.4
Textiles-----	54.8 :	0.2
Wood-----	86.7 :	0.3
Paper-----	1,113.4 :	4.5
Primary metals-----	827.4 :	3.3
Metal fabrication-----	1,262.5 :	5.1
Machinery-----	1,617.6 :	6.5
Transportation-----	574.2 :	2.3
Electrical and Electronics-----	6,683.9 :	26.9
Nonmetallic minerals-----	339.3 :	1.4
Petroleum and coal-----	30.7 :	0.1
Pharmaceuticals-----	1,506.6 :	6.0
Chemicals-----	3,000.3 :	12.1
All other-----	1,643.4 :	6.6
Total-----	24,856.4 :	100.0

Source: Johnson, op. cit., p. 452.

Another NRC program is the Program for Industry/Laboratory Projects (PILP). PILP aims at transferring research discoveries made in Federal and university laboratories to marketable products. Funds are generally provided through the negotiation of a contribution agreement or through research contracts with Canadian companies. The PILP budget was \$23.9 million in 1983-84 and is estimated to be \$29 million in the 1984-85 fiscal year. Part of the PILP budget is specifically designated for developing the biotechnology industry in Canada.

Through the Department of Regional Industrial Expansion \$169 million was provided to the DIPP in 1983/84. 1/ This program enhances and maintains a high technological development capability for defense export sales. 2/ Industries exporting military products may receive 50 percent of the cost through DIPP for R&D and for more modern equipment to maintain high standards. Only companies in the defense industry or defense subcontractors are eligible for DIPP assistance. The support takes the form of contributions and repayable loans on a negotiated cost-shared basis. The 1984/85 DIPP budget is \$130.7 million.

Other official programs are devoted to R&D in the application of energy technology. The Federal Government buys solar heating equipment through the Purchase and Use of Solar Heating (PUSH) program. The equipment is used for government buildings and Crown (state-controlled) corporations and is purchased to strengthen the regional solar industry. The electronics industry is supported through a Microelectronic Support Program (MSP) of the EDP. The objective of the MSP is to encourage industries to apply microelectronics to their programs. The budget of MSP was \$7.5 million for 1981-82. The Petroleum Incentives Program (PIP) will provide eligible corporations with up to 80 percent of the cost for exploration and development of petroleum on Federal lands, depending on the percentage of Canadian corporate ownership. To be eligible, a firm must be controlled by Canadians with at least 65 percent of the corporate ownership being Canadian. The Industrial Energy R&D Program offered grants of about \$2 million in 1980-81 to firms engaged in industrial energy conservation. 3/

Governmental research and technology transfer is another means by which the R&D process can be furthered. Through the system of contracting out, governmental science and technological requirements are given to the private sector. The Services Administration contracts out to consultants to work on projects such as auditing Governmental departments. Canadian Patents and Development Limited is a Crown corporation that provides publicly funded research technology (i.e., Governmental departments, universities, etc.) to industry.

The Government has further encouraged R&D through the Income Tax Incentive, whereby scientific research expenditures can be given an immediate tax deduction of 100 percent. Industries are "permitted to deduct from their

1/ In 1982, the Department of Industry, Trade and Commerce and the Department of Regional Economic Expansion were merged to form the Department of Regional Industrial Expansion (DRIE).

2/ The program grew out of a 1959 Canada-U.S. Defense Production Sharing Agreement. DIPP supports Canadian international defense co-operative agreements for research, development, and production. DIPP support enhances the competitiveness of Canadian companies in supplying defense-related products to the international market.

Canada now has other defense sharing agreements with the United Kingdom, France, Germany, Italy, the Netherlands, Norway, and Sweden.

3/ A further discussion of official assistance programs in the energy sector is included in the section on targeting in specific Canadian industries that follows.

incomes an additional 50 percent of increased scientific research expenditures over a base amount." ^{1/} Further, through the Investment Tax Credit, corporations can receive a tax credit ranging from 10 percent to 25 percent for scientific research if they are located in certain geographic regions. The following tabulation describes Canadian support for technology development through estimated amounts provided to each program.

Canada: R&D incentives, 1980-81 estimates

(millions of dollars)

IRAP-----	48
DIPP-----	169
PILP-----	24
Training-----	294
Tax writeoff/investment tax credits---	<u>225</u>
Total-----	760

The information services were established to provide Canadian industries with up-to-date scientific and technological techniques that have already been developed. The NRC provides this information to industry and business alike. Various types of laboratories were created for industries to use as research facilities (i.e., marine dynamics and engine-test laboratories) that would have otherwise been unavailable. The NRC also provides research and development contracts to industries, with the most important contract dealing with the space industry. Within the NRC, the Technical Information Service offers technology to small businesses that do not have the resources and would not be capable of remaining competitive without this new found technology. It also supplies in-plant engineering assistance at no cost. This is one form of technology sharing and is used to increase productivity, develop new processes and marketing techniques, etc.

Training in the business and industrial sectors is also provided by both Provincial and Federal Governments. The Centre of Advanced Technology, through the Department of Industry, Trade, and Commerce, Office of Science and Technology, develops technical competence in specific areas to provide training in manufacturing techniques. The Training in Business and Industry Program is to train personnel in areas from academics to high technology. The cost of this program is shared by the employer and by the province. The Canada Manpower Centre is a federally and provincially funded program with a 1982-83 operating budget of 5 million dollars and is administered by the Canada Employment and Immigration Commission. The Government pays for 100 percent of the instruction, aids, and equipment for industrial and institutional programs. No one corporation in any province may exceed the amount of \$500,000. The Federal Government also offers job search and relocation assistance, job training for those displaced by clothing and textile imports, and training for the unemployed for work in various sectors.

^{1/} ABC in Canada, 1981-82, p. 199.

Cartel and Merger Policy

Canadian antitrust policy is not considered to be as tough as U.S. antitrust law. 1/ In the last seventy years only eight mergers have been challenged in the courts. 2/ The Combines Investigation Act is the basis of Canadian antitrust policy. After 4 years of preparation, the Government last year introduced a reform bill that touches all major aspects of competition policy--mergers, monopolies, and conspiracies. Under the proposed changes, Canadian antitrust law will cover Crown (state-owned) corporations. Mergers will be placed under the jurisdiction of the civil court system (as opposed to the criminal courts). 3/ However, mergers that save resources for other sectors of the economy will be permitted even if they reduce competition.

Rio Tinto case.--The most celebrated antitrust case in recent Canadian history involved a uranium cartel. In spite of a tradition against price fixing, the Canadian Cabinet gave full support in 1972 to Government participation in forming an international cartel to control the price of uranium with Canada, South Africa, France, Australia, and Rio Tinto Zinc Ltd. (RTZ), a multinational based in London. The cartel was formalized in June of the same year, and in subsequent meetings a floor price of \$6.25/per pound for the European market and \$6.55/per pound for the Japanese market was proposed with an annual increase of 0.25%. 4/ The Canadian producers had desired a floor price of \$12/per pound. The Canadian domestic market was not included in the terms of the arrangement because of existing antitrust laws, but the Cabinet did not oppose arrangements for setting up an export cartel. The withdrawal of the Australians from the cartel was soon followed by French and South African withdrawal in 1974. The Canadian producers then had predominate control of the cartel. Existing obscure records indicate that the cartel may have dissolved in 1976. However, the cartel members supposedly continued to meet through the Uranium Institute, which had been formed the previous year. In June 1975, the price for uranium was set at \$26 per pound. During the 3-year operation of the cartel, the uranium price increased sevenfold. 5/

1/ This is because Canadian antitrust policy has been administered under Canada's criminal statutes with a higher standard of evidence required for a criminal offense. The higher standard had led to difficulty in enforcing the previous law.

2/ The Economist, Apr. 7, 1984.

3/ Under the proposed changes, regulation of monopolies will likewise be transferred from the criminal to the civil courts. Any corporate policy that lessens competition or controls the market production or price of a product will not be permitted. The conspiracy legislation in the Combines Investigation Act had been rendered ambiguous by the courts. Under the new legislation, the Government will only have to prove that the parties entered into an agreement in order to infer that collusion took place. It does not have to prove that the agreement intended to lessen competition. Canadian Crown corporations will now become subject to regulation if they are in competition with the private sector. Therefore, the favored status of Crown corporations will be taken away. Crown corporations were immune from prosecution under the previous legislation unless the specific statutes by which they were established subjected them to antitrust law.

4/ Stewart, Larry, "Canada's Role in the International Uranium Cartel," International Organization, Autumn 1981, p. 664.

5/ Ibid., p. 669.

Since the forming of the uranium cartel, all agreements had been kept secret. However, when the public learned of this agreement, the Canadian Government passed the "Uranium Information Security Regulations" which prevented the release of information concerning the cartel to foreign governments.

In 1981, six Canadian companies (two Crown corporations and four private firms) were charged with criminal conspiracy to fix prices in the domestic uranium market. Since Crown corporations could not be prosecuted for antitrust violations under the Combines Investigation Act, the Justice Minister declined to prosecute the private sector codefendants involved in the case. Prosecution of the case was finally abandoned in early 1984.

FIRA.--The Foreign Investment Review Agency is also very active in negotiating mergers and acquisitions in Canada. Whenever such action involves a foreign firm or investor, it is subject to FIRA review. Approval of the merger or acquisition could be conditioned on changes taking place in the financial holdings of companies, complete or partial divestiture being a possibility.

U.S.-Canada agreement.--In a recent agreement, United States Attorney General, William French Smith, and Canadian Minister of Consumer and Corporate Affairs, Judy Erola, signed the "Memorandum of Understanding Between the Government of the United States of America and the Government of Canada as to the Notification, Consultation, and Cooperation with Respect to the Application of National Antitrust Laws" in March 1984. This agreement calls for notification to the other Government of an antitrust investigation that will involve the other's national interest. The agreement calls for obeying the other's antitrust laws and for the exchange of information for the enforcement of these laws.

Quebec.--The Province of Quebec has a program, operated under the Quebec Industrial Development Corporation, to promote mergers and acquisitions among manufacturing firms in the province. The objectives of the merger would be "to increase the viability and economic performance of Quebec based companies." 1/ Financial assistance may be in the form of secured loans or loan guarantees (at the current market rate of interest), interest rebates on loans, or equity investment in the firm. 2/

1/ J. Peter Johnson, Government Financial Assistance, p. 390.

2/ QIDC's investment cannot exceed 30 percent of a firm's total assets. The QIDC is discussed separately in the above section on provincial incentive programs.

Targeting Techniques in Specific Canadian Industries

Aerospace

The Canadian aerospace industry receives official Government support by three means: (1) research and development (R&D), (2) export development assistance, and (3) Government ownership. Prior to direct Government ownership in the 1970's, R&D and export development programs provided most of the official assistance to the aerospace industry. Government support for R&D and for export development has continued into the 1980's and averaged \$146 million for 1981-82 and \$123 million for 1982-83. 1/

The two major Canadian airframe manufacturers, de Havilland and Canadair, were purchased by the Government in 1974 and 1976 for \$40.5 million and \$46.6 million, respectively. With this action and continuing support, direct Government ownership and equity investment constitute the major means of government support to the industry today. Such support for both companies averaged \$733 million for 1981-82. The companies have been officially subsidized through loan guarantees and equity investments worth \$2.5 billion from 1981-83. 2/

de Havilland.--A Government credit line of \$450 million was extended to the company in 1981. In addition, \$260 million in equity investment took place in 1982 and 1983. There were reports in early 1984 that US\$759 million in export credits, purchases, and other support over a 10-year period was under consideration. 3/

Canadair.--A \$1.35 billion loan guarantee was extended in 1982. This was followed by a total equity investment of \$440 million for 1982-83. The Canadian Development Investment Corporation (CDIC), the government-owned holding company responsible for the Government's control of various sectors, announced a restructuring of Canadair, Ltd., in March 1984. Canadair's operating loss of \$145.1 million in 1982 was reduced to \$83.8 million in 1983. At the time of restructuring funding of \$433 million was requested, most of which is for equity and to cover debts of the ailing corporation. It is expected that \$150 to \$200 million will be required annually to meet the financial responsibilities of the original company.

Other.--In 1983, the Canadian Government announced a number of joint research and development programs with industry. Three of these programs involved the aerospace industry and are briefly outlined below:

- (1) A 10-year program for research, development and production of aircraft engines entered into with Pratt and Whitney of Canada. P&W's share is \$1.2 billion and the Canadian Government's share is \$468 million;

1/ "Canadian Government Support for the Aerospace Industry," report prepared by Margaret Keshishian, U.S. Department of Commerce, International Trade Administration, Office of Aerospace, November 1984, p. 5.

2/ Ibid.

3/ Business Week, May 7, 1984, p. 43.

- (2) A joint plan between the Government and Bell Helicopter Textron to build a plant in Quebec. The Government's share is \$275 million (Federal Government: \$165 million, Provincial Government: \$110 million) and Bell's share is \$239 million;
- (3) A \$72.6 million understanding for the development and manufacture of light twin-engine helicopters in Canada between the Government (\$34.9 million) and Messer Schmitt-Bolkow Blohm GmbH (\$37.7 million).

Automotive

Prior to the signing of the Automotive Products Trade Act (APTA), the Canadian automotive sector was protected by a high tariff to prevent competition from entering the small Canadian domestic market. The high tariffs, plus an import duty remission to Canadian manufacturers, were designed to increase production, but this became a trade issue between the United States and Canada. The obstacle was resolved by the APTA which removed duties on trade in specified motor vehicles and original-equipment automotive parts.

APTA has been implemented differently by the two countries. Canada gives duty-free status on a most-favored nation (MFN) basis, whereas the United States applies this status only to Canada. Because the United States limited the duty-free status only to Canada, and not on an MFN basis, it was necessary for the United States to obtain a waiver from the GATT Council. The waiver was approved in December 1965.

It has been argued that APTA favors Canada at the expense of the United States. ^{1/} The Canadian Government sought, through the APTA, to help its industry adjust to a greater level of competition. Consequently, Canada applies a duty-free status only to automotive imports for bona fide manufacturers of motor vehicles. The United States, on the other hand, provides duty-free status to all new, automotive imports from Canada, whether for manufacturers or individuals. According to the agreement, the United States provides duty-free status for automobiles assembled in Canada with a 50-percent North American content. Therefore, Canada can incorporate duty-free parts from third countries into automobiles produced in Canada and export these products duty-free to the United States. Also, the Canadian manufacturers were required to increase production by at least a certain percent of the increase in sales. Furthermore, in "Letters of Understanding" Canadian manufacturers pledged to increase the Canadian value added by at least 60 percent by the end of 1968.

^{1/} Under the APTA Canadian manufacturers received favored status. In a previous report, the U.S. International Trade Commission stated that "the agreement as implemented by Canada is not a free trade agreement, and it has primarily benefited the Canadian economy." The report further states that the concessions provided through APTA are made by the United States whereas Canada made no substantive concessions except those in the Letters of Understanding. See Canadian Automotive Agreement, United States International Trade Commission, Ninth Annual Report, 1976.

Telecommunications

In the broadest terms, telecommunications is considered to include switching and transmission equipment, desktop computer systems, terminals, supercomputers, peripherals, software, along with radio, telephone, telegraph and data processing systems and services. 1/ The Canadian telecommunications carriage industry carries a \$6 billion market. This carriage industry is dominated by two telecommunications systems that account for 93 percent of the total market: TransCanada Telephone System (TCTS) and CNCP Telecommunications (CNCP). TCTS is an association of the largest telephone systems operating in each province plus Telesat Canada, the domestic satellite carrier. The telephone systems are a mixture of provincially owned operations (Alberta, Manitoba, and Saskatchewan telephone systems), privately owned systems (all other provincial telephone systems), and federally-owned Telesat system (jointly owned by other major carriers as well). 2/ CNCP operates a microwave system and has recently (1979) been interconnected with the telephone systems of Bell Canada (the largest member of TCTS).

Canada's production and export of telephone and telegraph equipment is dominated by Northern Telecom. A majority of Northern Telecom is owned by Bell Canada. In 1983, Northern Telecom exported over 56 percent of its equipment to the United States; this was valued at \$3.3 billion. By 1988, Northern Telecom hopes to raise this share to two-thirds of its total sales, with a value of \$5 billion. 3/ Over the past 5 years, Canadian exports of telecommunication products have greatly increased but imports into the Canadian market have increased at only a modest rate. Table 31 shows the current state of Canadian telecommunications trade.

Table 31.--Canada: Trade in telecommunications equipment, 1/ 1979-83

Year	(In millions of U.S. dollars)					
	World			U.S.		
	Exports	Imports	Balance	Exports	Imports	Balance
1979-----	230	138	92	128	64	64
1980-----	295	136	159	156	77	79
1981-----	357	188	188	121	101	20
1982-----	475	164	311	146	93	53
1983-----	<u>2/</u>	<u>2/</u>	<u>2/</u>	188	83	105

1/ Does not include microwave, satellite, fiber optics and mobile radio equipment.

2/ Not available.

Source: Compiled from official statistics of Statistics Canada.

1/ For an assessment of the competitive advantage of U.S. versus foreign-made telecommunications products, see "Changes in the U.S. Telecommunications Industry and the Impact on U.S. Telecommunications Trade," USITC Publication 1542, June 1984.

2/ The Canadian Government also owns and controls Teleglobe Canada.

3/ Walter Light, President of Northern Telecom, 7 May 1984, Press Conference, Cable.

The Canadian Government promotes the telecommunications industry through restrictive foreign investment and government procurement policies, direct assistance to domestic firms, restrictions in the places data can be processed, and discriminatory tariffs and customs procedures. Canada also applies a discriminatory customs valuation of computer and data processing services when transmitted through a Canadian telecommunications system. Further, the Government has recommended that all data processing operations by multinational corporations located in Canada be performed in Canada. ^{1/} Although this is not legally enforceable, some non-Canadian companies have felt the pressure to maintain a data processing facility in Canada even though processing could be done at a lower cost in the United States. ^{2/}

Through the Foreign Investment Review Act, most applications for foreign investment in telecommunications have been approved. The Government does not encourage investment in telecommunications transmission because Canadian ownership of these facilities is considered of national importance. ^{3/} Carrier operations are regulated both by the Canadian Radio-Television and Telecommunication Commission (CRTC), a Federal agency, or by provincial government utility boards.

The Canadian Government and telephone companies have emphasized a "buy Canada" policy by encouraging the private sector to purchase Canadian telecommunications equipment. The Government has also increased financial assistance to domestic telecommunications firms. For example, to pay for new capital equipment costs and product development, Mitel, a private company, was given US\$24 million which is expected to help increase sales tenfold. Through the Department of Communications (DOC), the Telecommunications Engineering Laboratory tests certain telecommunications equipment and provides technical assessment. For example, the DOC developed Telidon, a videotext technology, and has sponsored the Telidon Industry Investment Stimulation Program (TISP). Through TISP the Government has had over 6,000 Telidon terminals built by Canadian firms, and over 50 Telidon projects, including submissions by telephone companies, have received more than US\$9.5 million.

On a percentage basis, Canadian import tariffs on telecommunication (telephone) equipment are relatively high. The Canadian tariff on telephone equipment is 17.5 percent compared with the U.S. tariff of 8.5 percent. Canadian tariffs for telegraph products are lower, but the difference with the U.S. tariff remains high.

Because of the recent liberalization on interconnect equipment policies, a possibility for free trade in the telecommunications industry exists between Canada and the United States. However, Canada's largest producer of telephone and telegraph equipment, Northern Telecom, has been reluctant to support this initiative. Having already acquired a large share of the U.S. market (16.5 percent of private branch telephone exchanges in 1983), Northern Telecom believes that sectoral free trade has the possibility of limiting Canada to a fixed market share of the entire U.S. telecommunications equipment industry.

^{1/} Transnational Data Report, vol. VI, No. 6, p. 319.

^{2/} Ibid.

^{3/} British Columbia Telephone Co. and Quebec Telephone Co. are indirectly owned and controlled by a U.S. corporation, General Telephone and Electronics.

Petroleum/gas

Canada is richly endowed with natural energy resources including petroleum, natural gas, and uranium. The recent course of energy policy development, however, has become a struggle between Federal and provincial governments. This struggle for predominance in the energy sector will continue affecting not only the development of resources, but also the price level and the volume of investments in the sector and the export of energy resources.

Canada and the United States are each others' largest energy trading partner. Canada supplied the United States with 565,000 barrels of oil per day in 1983 (the second largest supplier to the United States) and provided 80 percent of the gas imports for the United States (4 to 5 percent of the U.S. market). The United States is a net exporter of coal to Canada, and U.S. multinational corporations have large investments in the Canadian energy sector.

The National Energy Board (NEB) imposes export approval requirements for oil, natural gas, and electricity in Canada. Before such exports can be authorized, the requirements of the Canadian economy must be foreseen. These requirements have not considerably hampered Canadian exports of these products to the United States. In 1978, the NEB estimated that Canada had 11 billion barrels of oil in established, producing areas, such as Alberta, British Columbia, and Saskatchewan. In addition, Canada is estimated to have many times this amount in the undeveloped frontier, offshore, and tar sands areas. According to one estimate, the Beaufort Sea (located in the Arctic) contains 9.4 billion barrels, the east coast offshore areas have the potential of 7.4 to 10 billion barrels, and the Alberta tar sands have 931 billion barrels, (with only 80 to 190 billion barrels economically feasible to recover). Some of these areas are expected to be producing within the next decade. In the Beaufort Sea, Dome Petroleum Ltd. has projected a target of 200,000 barrels per day (b/d) in 1985 and 750,000 b/d in 1990. Production in the Alberta tar sands is expected to exceed 750,000 b/d by 1995. ^{1/}

In 1960, Canada exported 23 percent of the petroleum it produced; by the mid seventies, this figure increased to more than 50 percent. However, because of the heavy reliance of Quebec and the Maritime provinces on foreign oil, Canada is now a net importer of oil. This is expected to change in the near future. By 1990, Canadian officials estimate that demand for oil will be 1.475 million b/d (less than the 1979 figure); production will be relatively higher at 1.520 million b/d, leaving a slight surplus.

Canadian natural gas reserves are found in the vicinity of petroleum with abundant supplies in the frontier regions. Canada exported 40 percent of the natural gas extracted in 1974, with this percentage falling to 30 percent in 1979. (U.S. regional dependencies on Canadian natural gas exist in the Pacific Northwest and New England.) Estimates for natural gas in trillion cubic feet are found in table 32.

^{1/} Armstrong, Willis, et al, Canada and the United States: Dependence and Divergence, op. cit., p. 69.

Table 32.--Canada: Discovered gas resources
and estimated additions, 1978

(in trillions of cubic feet)				
Item	Discovered by end 1977	Additions 1978-2000	Ultimate potential	
Conventional producing areas:				
Western Canada-----	65.8	38.0		146
Ontario/Eastern Canada-----	.3	-		1
Total-----	66.1	38.0		147
Frontier areas:				
Arctic Island/Beaufort-----	14.5	34.0		63
East Coast offshore-----	--	18.0		27
Other-----	--	--		6
Total-----	14.5	52.0		96

Source: Canada and the United States: Dependence and Divergence, p. 70.

The "Canadianization" initiatives of the early 1980's are an important part of Canada's industrial policy. The National Energy Program (NEP), established in October 1980, has as its foremost goal to increase Canadian ownership of the oil and gas industry to 50 percent by 1990. In contrast, in 1980 foreign ownership of oil and gas was 74 percent and in 1982 the figure was approximately 70 percent. The NEP is also designed to achieve energy self-sufficiency by eliminating oil imports by 1990; and by increasing the Government's revenues from energy projects through higher taxes; by raising the amount of the sector owned by the Government; by reducing oil's share of residential, commercial, and industrial energy needs to 10 percent by moving towards gas, electricity, coal, and renewable energy, and by disassociating Canada's domestic oil and gas price from the world's so that the Canadian consumer will pay no more than 85 percent of the world price level. The newly elected Muloney government campaigned on a platform that called for elimination of some of the discriminatory features of the NEP, particularly the controversial back-in provision, under which a share of energy assets retroactively revert to Government control. ^{1/}

PIP.--The Government has offered a variety of incentives and programs to benefit Canadian-owned and Canadian-controlled corporations and to see that the objectives of the NEP are accomplished. The Petroleum Incentives Program (PIP) replaces the nondiscriminatory depletion allowance with incentives for oil exploration development. PIP provides grants to cover 25 percent of exploration costs to any company. However, companies with at least 65 percent Canadian ownership may receive up to 80 percent of their exploration expenditures.

^{1/} Through the NEP the Federal Government is to receive a 25 percent equity share in leases on Federal land held prior to the initiation of the program and where oil and gas exploration has been successful.

From 1981 through 1983 PIP grants by the Federal Government amounted to \$2.5 billion. ^{1/} Two companies, Petro Canada and Dome Canada Ltd., accounted for 38 percent of all PIP grants given out through the end of 1983. The Petroleum Incentives Administration, which oversees PIP, estimates that Federal expenditures on the program will amount to \$10.6 billion through fiscal 1988. However, the entire program is expected to come under review by the newly elected government.

Another area that was a setback for foreign corporations in Canada is that to be licensed to produce oil or gas on Federal lands, a firm must be at least 50 percent Canadian owned and controlled.

Price Controls.--Canada continues to maintain oil and gas price controls. The Federal Government and the Government of Alberta agreed to raise the price of oil to 75 percent of the world price, and to raise gas prices to 65 percent of the price for crude oil. However, with the 1982 drop in the world oil price, 90 percent of Canadian oil is priced at the world price. The price for gas remains controlled with high artificial barriers placed on exports to the United States and a low artificial price for the Canadian consumer.

ANGTS.--The Alaska Natural Gas Transportation System (ANGTS) has the possibility of connecting the gas fields of Alaska and Alberta with markets in the midwestern and western sections of the United States. Upon completion, ANGTS could deliver 2.4 billion cubic feet/day. This is equivalent to 5 percent of U.S. consumption or 400,000 bbl/day. Thus far, only two stages of the pipeline have been built. These can deliver about half the planned capacity.

Although privately owned Canadian corporations have benefited greatly through these initiatives, Government revenues have also increased. All oil and gas producers are subject to a 12-percent tax on their net operating revenue related to oil and gas production. Further, gas is now subject to a tax that has been increased by \$0.75 since 1980.

The falling world oil price has undermined Canada's strategy for the National Energy Program. Not only has petroleum output decreased 10 percent, but the number of new oil wells completed and the number of oil rigs in use has also plummeted. ^{2/} Between 1980 and 1981, the Canadian price of gasoline nearly doubled. With these complications came Exxon Corporation's Canadian subsidiary's announced pullout of a \$14 billion project in Alberta and the pending cancellation of the Alaska gas highway pipeline, which would have produced billions for the Canadian economy. In addition, between 1980 (the beginning of the NEP) and 1982, the share of Canadian ownership in the oil and gas industry rose approximately 4 percent for a total ownership of 30 percent of the industry. With the drop in world oil prices, the NEP's goal of increasing Canadian ownership to 50 percent by 1990 seems remote. Also, if the projects designed for northern Canada fail, like the Alberta tar sands project, Canada will be importing 50 percent of her oil by the end of the decade, far from the goal of Canadian self-sufficiency.

^{1/} The province of Alberta administers its own PIP program. Its expenses for the same 1981-83 period were \$771 million.

^{2/} The number of oil rigs in use was expected to fall 50 percent between 1980 and 1982 with most of the rigs leaving Canada for the United States.

In 1975, the Federal Government created PetroCanada, a Crown corporation to buy oil and gas properties. Since that time, PetroCanada has become the seventh largest oil and gas producing company in Canada. As of 1979, only 8 of the top 25 gas-producing companies in Canada were Canadian owned. The Canadian controlled companies accounted for 18.7 percent of sales in the industry. ^{1/} PetroCanada is a direct policy instrument of the Government in the energy sector. This Crown corporation acts as an agent of the Government to acquire additional firms. PetroCanada bought Petrofina Canada, a subsidiary of the Belgian state-owned firm, for \$1.2 billion. The Canadian Ownership Account, established by the Government, will be used to finance an increase of the public ownership in the energy sector.

Dome Canada Ltd., the 12th largest oil and gas producer (a 1982 figure) in Canada and the largest Canadian-owned oil company, has recently run into hard financial times. With Dome's purchase of the majority share of Hudson Bay Oil and Gas from Conoco Inc., a U.S. corporation, for US\$1.96 billion, Dome's debt climbed to US\$6.5 billion; its assets rose to US\$9.4 billion. Because of lowered oil prices and a loss of almost US\$200 million in sales and investment in January-June 1982, Dome has had to continue borrowing heavily from the banking community. The Canadian Government, in June 1982, authorized State-owned PetroCanada to guarantee loans totaling \$100 million to Dome Canada Ltd., a subsidiary of Dome Petroleum. Later the same year, Dome's creditors agreed to delay payment of the company's debts that included the \$1 billion loan. The Canadian Government along with four of Canada's major banks (Toronto-Dominion, Canadian Imperial Bank, Royal Bank of Canada, and the Bank of Montreal) each agreed to buy \$400 million in Dome debentures that can be converted into stock over the next 10 years.

^{1/} Morici, Smith and Lea, op. cit., p. 46.

THE REPUBLIC OF KOREA'S INDUSTRIAL POLICY AND TARGETING PRACTICES

The Korean Government has recently started to move away from direct public sector intervention toward a more market-oriented economy. Nonetheless, Korea exercises substantial influence over many aspects of its industrial economy through legislation, regulation, and government programs. The following historic review provides a summary of the evolution of Korea's industrial policy, and provides a foundation for understanding the significance of current policy direction.

Historical Overview

Korea's colonial period under Japanese occupation (1910-45) was a period of rapid industrialization linked to the Japanese economic system. During this time, the net value of commodity output of the manufacturing sector grew annually by an average rate of 10 percent. ^{1/} However, most of the heavy manufacturing and mining activities, along with electrical power production, were located in the North, while most of the light industry, agriculture, forestry, and fishing activities were located in the South. ^{2/} Because of its light industry, the Republic of Korea (Korea) at the time of independence and partition had a large trained workforce familiar with small-scale manufacturing and a group of entrepreneurs exposed to Japanese managerial and organization techniques. ^{3/} While these constituted the preconditions for rapid growth, South Korea did not reach a per capita GNP of \$100 until 1963. ^{4/}

In the mid-1960's, Korea was characterized as a resource-poor, low-income developing nation whose population depended primarily on agriculture. Domestic savings and exports were insignificant and the country had not fully recovered from the devastation of the Korean War (1950-53). In the past two decades, however, Korea has been transformed into a dynamic high-growth economy. Korea's rapid growth has passed through several major periods of development, which are discussed briefly below. ^{5/}

^{1/} See Leroy P. Jones and I. Sakong, Government, Business, and Entrepreneurship in Economic Development: The Korea Case, Cambridge: Harvard University, 1980, pp. 22-27.

^{2/} Ibid.

^{3/} Following the Japanese surrender at the end of WWII, U.S. forces occupied southern Korea and Soviet forces established a presence in the north. The Republic of Korea was created after the 1948 elections in the South, and the Presidency of Syngman Rhee was established. Months later, the communist-led Democratic People's Republic of Korea was established in the north. Partition has resulted in an ever-present political risk in Korea. The demilitarized zone at the border between the North and South remains supervised by United Nations forces. The United States also maintains a significant military presence in South Korea. Negotiations to reunify the peninsula have been carried on intermittently over a period of years with little success and the situation remains a source of tension and uncertainty. Korea Fund Prospectus

^{4/} Bank of Korea, Principal Economic Indicators, 1984, No. 14, p. 4.

^{5/} Unless otherwise noted, the discussion of industrial incentives through the 1960's borrows heavily from Larry E. Westphal and Kwang Suk Kim, "Korea," in Development Strategies in Semi-industrial Economics, Bela Balassa, et al., Baltimore: John Hopkins Univ. Press, 1982, pp. 212-279.

Import substitution

Following the U.S. Military Government's occupation (September 1945 to August 1948) after partition, Korean industrial policy emphasized developing domestic industries to substitute for imports. Import substitution was emphasized for such key industries as cement, oil refining, and electricity production. As part of this policy, the domestic market was protected by stringent import controls and a multiple-exchange rate system. Large purchases of Korean won at the official exchange rate by the U.N. military establishment provided the incentive to maintaining an overvalued exchange rate from which a complex structure of multiple exchange rates evolved to deal with recurrent balance-of-payments problems. Foreign exchange rates varied according to type of import and source of foreign exchange. Foreign exchange was allocated by various auction and bidding procedures, by lottery, and by an exchange tax system. During this period, several major import-substituting industries were exempted from tariffs on machinery and intermediate goods.

Increasing exports was not a high priority because the foreign exchange needed to finance domestic industry was supplied by foreign aid. In fact, between 1953 and 1960, foreign aid paid for 75 percent of Korea's imports and 70 percent of its gross capital formation. ^{1/}

In spite of the priorities given to import substitution, exports nonetheless received some incentives. Of particular significance was a measure for converting export earnings into foreign exchange certificates that could then be traded at a premium on the uncontrolled free market. These foreign exchange certificates could be used to import popular products otherwise not permitted. Exporters also received direct subsidies in the form of loans, preferential interest rates, and exemption from tariffs on imported goods used in the production of export products. (Table 33 provides a summary of export incentives.)

Export promotion

In the years following the student revolution that overthrew the regime of Syngman Rhee in 1960, social, political, and economic instability led to several attempts at policy reforms and economic liberalization. These attempts were largely ineffectual until 1964, under the regime of Chung Hee

^{1/} Korea's Economy, Korean Economic Institute, vol. 2, No. 3, April 1982, p. 5.

Table 33.--Korea: Major Export-Promotion Schemes, as of 1983

Types of Incentives	Beginning date/duration
Tax incentives:	
Commodity tax exemption-----	April 1950-June 1977
Business tax exemption-----	January 1962-June 1977
Reduction of corporation and income tax by 50 percent on earnings from exports.	January 1961-December 1972
Accelerated depreciation on allowance for fixed capital directly used for export production in mining, fishing and manufacturing.	January 1961-
Tax credit for foreign-market develop- ment expenditures.	August 1969-
Tax credit for losses due to operations in foreign markets.	March 1973-
Tax credit for losses due to price changes.	December 1981-
Tax credit for expenses of overseas entertainment.	December 1981-
Special consumption tax exemptions-----	December 1976-
Tariff incentives:	
Tariff exemptions on capital equipment for export production.	March 1964-December 1973
Tariff payments on an installment basis for capital equipment used in export production.	January 1974-
Tariff moratorium (for 2 months) on raw- material imports for export production.	February 1977- ? 1977
Tariff drawback on imported raw material used for export production.	July 1975-
Wastage allowance-----	July 1965-
Financial incentives:	
Financing for export sales-----	February 1948-July 1955
Export shipment financing-----	June 1950-July 1955
Export promotion fund financed by counterpart fund.	November 1959-January 1964
Financing imports of materials to be used in export production.	October 1961-February 1972
Export credits (trade credit before 1961).	June 1950-
Financing suppliers of U.S. offshore military procurement.	September 1962-
Fund to promote the export industry-----	July 1964-September 1969
Fund to convert small and medium-size firms into export industries.	February 1964-
Fund to prepare exports of agricultural and fishery products.	September 1969-
Foreign currency loans-----	May 1967-
Financing exports on credit-----	October 1969-

Table 33.--Korea: Major Export-Promotion Schemes, as of 1983--Continued

Types of Incentives	Beginning date/duration
Other promotion schemes:	
Foreign-exchange deposit system-----	June 1949-January 1961
Trading license based on export performance.	January 1953-
An export bonus with preferential foreign exchange.	? 1951-May 1961
Payment of export subsidy-----	? 1954- ? 1955 and ? 1960- ? 1965
Discount on railroad freight rates-----	? 1958-
Monopoly rights on exports of specific items to specific areas.	April 1960-
Creation of exporters associations on various export products.	September 1961-
Financing KOTRA-----	? 1962-
Export-import link system-----	November 1962-(dismantled ?)
Discount on electricity-----	? 1965- ? 1976
Waiver issuance for shipping-----	? 1965- ?
Local L/C system-----	March 1965-
Differential treatment of traders based on export performance.	February 1967-
Export insurance-----	January 1969-
General trading company-----	May 1975-
Export-import bank-----	June 1976-

(?) indicates month program began or ended is not available.

Source: Wontack Hong, "Trade, Distortions and Employment Growth in Korea," pp. 82 and 83, and U.S. Embassy, Seoul.

Park. Policymakers accepted the view that rapid economic development depended upon export-directed industrialization. By the mid-1960's, emphasis on import substitution was reduced and export-oriented industrialization was encouraged through selected incentives and direct intervention. ^{1/}

A uniform exchange rate was established in 1964, and the won devalued from 130 to 255 to the U.S. dollar. In 1965, the full set of incentives offered to exporters were extended to include producers of intermediate goods used in the production of exports. In 1966, tariff exemptions were granted on imports of machinery and equipment used to produce exports and intermediate products, and allowances for accelerated depreciation were granted in the calculation of business expenses for tax purposes.

^{1/} For example, exporters had preferential access to foreign exchange loans and the preferential interest rates to exporters remained unchanged when the nonpreferential commercial bank rate was raised from 16 to 26 percent in 1965.

During this period, existing incentive schemes were strengthened and a variety of new incentives were introduced. The preferential rate on working capital loans to exporters fell gradually from 14 percent in 1960 to 6 percent in 1967 and the amount exporters could borrow (proportional to the gross amount of foreign exchange earned) was progressively increased to compensate for the increasingly overvalued exchange rate.

New incentives to exporters also included exemption from import quotas, tariffs, and indirect taxes on intermediate and capital goods (whether domestic or imported), and exemption from indirect taxes on export sales. Other benefits included generous wastage allowances on imported products for export production and reduced prices for selected overhead items, e.g., electricity and railroad transportation. 1/ Exporters were also the major beneficiaries of a 50-percent reduction in direct taxes on income earned in exporting, along with allowances for accelerated depreciation and immediate access to subsidized short- and medium-term credit to finance working capital and fixed investments.

Development of strategic industries

Until the early 1970's, manufacturing investments were concentrated in light industries and most of the export incentives discussed above applied to these industries. However, from 1973 through early 1979, in response to changing domestic and international conditions, the Korean Government shifted emphasis to the development of exports in the large-scale heavy machinery and chemical industries and steel and shipbuilding. 2/ Incentives and import restrictions were specifically expanded to protect and encourage development of the designated strategic industries. Home-market protection from foreign competition included restrictions on foreign ownership and direct foreign investment, and strict controls on export requirements.

The National Investment Fund (NIF) was established in 1974 to provide financing to promote major (or strategic) industries as well as to help increase exports. Through the 1970's, the NIF provided low-cost financing for purchases of domestic machinery, construction of domestic heavy machinery plants, purchases of domestically produced ships, and additional funds for exports on a deferred payment basis. 3/

The Korean Government also offered firms in strategic industries several tax incentive options. These incentives included: exemption from corporate taxes for the first 3 years after establishment of the plant and a 50-percent reduction of corporate taxes for the following 2 years; tax credits of 8 to 10 percent of the amount invested; or accelerated depreciation of up to 100 percent of the normal depreciation allowances. 4/

1/ Wastage allowances for duty-free and indirect tax-free imports of raw materials permitted some of these imports to be used in production for the domestic market. (See "Imports" section.)

2/ Heavy machinery and chemical industries includes nonferrous metals, fabricated metals, machinery, electronics, transportation equipment, precision machinery, chemicals, petroleum refining, and nonmetallic mineral industries. Dr. Bohn-Young Koo, "The Role of the Government, in Korea's Industrial Development," unpublished paper, Seoul, September 1984, p. 11.

3/ More information on the National Investment Fund is provided in the Financial Assistance section.

4/ Koo, op.cit., p. 14.

The present situation

The strong emphasis placed by the Korean Government on the development of large-scale heavy machinery and chemical industries resulted in an increase in the share of total manufacturing value added by these industries from 37.8 percent in 1972 to 52.6 percent in 1979. ^{1/} Exports of heavy and chemical products increased from 21.3 percent of total exports in 1972 to 38.4 percent in 1979. ^{2/} However, overinvestment in the heavy and chemical industries at the start of a worldwide economic slump in 1980 left many plants with severe overcapacity problems. Other factors, such as "the second oil shock," a loss of competitiveness of export products, overvaluation of the won, neglect of technology and skilled manpower development, and political and social upheaval (President Park Chung Hee was assassinated on Oct. 26, 1979) all contributed to severe internal structural problems and recession in 1980.

Furthermore, under-investment in many public service areas such as housing, health, and sanitation hampered balanced growth in the economy. Growth of the neglected agricultural sector lagged seriously behind the industrial sector. The deteriorating rural situation widened the disparity between rural and urban incomes, causing rapid migration of the rural population to large cities. The resulting population pressure on urban areas intensified many common urban problems. ^{3/}

Accordingly, Korea's investment policies for the 1980's, as outlined by the current 1982-86 5-year economic plan, call for more balanced growth, less direct intervention, and more reliance on market forces and nondiscretionary general incentives. The current economic plan places top priority on investments in the areas of energy conservation, technological innovation, manpower development, and the maintenance of Korea's export competitiveness. ^{4/}

The success of Korea's planning strategies and export-oriented policy is evidenced by the economy's steady growth of about 10 percent per year from 1966 until the recession in 1980. Recovery began in 1981 as export demand began to increase and in 1982, the gross national product (GNP) increased by 5.6 percent. In 1983, the Korean economy had an exceptionally strong performance, with GNP increasing by 9.5 percent. ^{5/}

Government planning.—In the early 1960's, Korea introduced a system of 5-year economic plans, drawn up by the Government (in consultation with relevant private institutions) to provide a framework for economic development. These plans have been an important factor in directing Korea's rapid economic growth over the past two decades. The success of the first two plans may have encouraged the increase in Korea's economic growth of

^{1/} Ibid., p. 15.

^{2/} Ibid., p. 14.

^{3/} To combat the debilitating imbalances between rural and urban areas which are common to developing countries, the Korean Government introduced the "Saemaul Undong" (New Community Movement) in 1971. This has been one of the most successful concepts devised by the Government. Among other achievements, the movement has been extremely successful in encouraging the balanced growth of industry and agriculture and in maintaining an approximate parity of rural and urban family income. Facts About Korea, Seoul: Korean Overseas Information Service, 1983, pp. 118-126.

^{4/} Fifth Five-Year Economic and Social Development Plan, 1982-86, p. 45.

^{5/} U.S. Embassy, Seoul.

7.9 percent during the First Plan and by 9.7 percent during the Second Plan. ^{1/} The Five-Year plans provide guidance for economic and social development and establish policies for achieving specific trade, investment, and financial liberalization goals. An examination of the current plan provides insight into possible future developments in industrial policy.

The 1982-86 economic plan projects an average annual rate of growth of 11.4 percent in the commodity export sector. To help reach this target, the Government has specified three specific goals to strengthen the competitiveness of exports and further develop the support system for exports. ^{2/}

(1) Upgrade the composition of exports.--As investment shifts away from labor-intensive industries, investment is to be encouraged in electronics and such heavy industries as shipbuilding and machinery. Special emphasis is to be placed on promoting exports in these industries. Joint ventures with large foreign companies are encouraged. These measures are expected to increase exports of the electronics, shipbuilding and machinery industries at an average rate of 31.5 percent a year.

(2) Strengthen export competitiveness.--To improve quality and other aspects of competitiveness, the Government plans to strongly support technology and manpower development. The emphasis of the incentive system will shift from direct support to non-discretionary support aimed at encouraging quality improvement.

(3) Expand export financing.--The Korean Government has projected an increase in export sales made on a deferred payment basis by the shipbuilding and machinery industries. The Government plans to subsidize loans for these industries.

Revisions to the current 5-year plan emphasize additional goals for the economy. According to The Revised Fifth Five-Year Economic and Social Development Plan: 1984-1986, the Korean Government has included maintenance of economic stability and the development of technology-oriented industries among its top priorities. These will be accomplished through the following measures:

To maintain economic stability:

- o Price stability will be consolidated by stabilizing domestic inflationary factors and by absorbing external inflationary pressures to the maximum extent possible.

- o Efforts will be made to improve the balance of payments by promoting sustained growth in exports and by encouraging substantial increases in domestic savings.

^{1/} The Bank of Korea, The Korean Economy: Performance and Prospects, Seoul, September 1983, p. 9.

^{2/} The primary source for this information is the Fifth Five-Year Economic and Social Development Plan: 1982-86, pp. 35-43.

- o Investments in technology and equipment in the private sector will be encouraged to attain economic growth of 7 to 8 percent a year, a growth rate needed to provide employment for the 450,000 persons who join the labor force each year.

The development of technology-oriented industries will be emphasized to raise the nation's level of technology closer to those in the industrialized countries through:

- o Increased efforts to encourage initiative and creativity in the private sector by promoting competition on the basis of the market mechanism.
- o Higher priority placed on technological innovation and the development of small- and medium-size manufacturers so as to strengthen the overall competitiveness of Korean industries.

When Korea began its industrial development push, Korean exports were mostly primary products; by the 1980's, almost all exports were manufactured goods. The Government targeted the chemical and heavy industries for development in 1977, and since 1982 these industries compose 48 percent of total exports. Korea has also diversified its export markets. The U.S. and Japanese share of Korea's market has declined significantly, but Korea still has a huge dependency on Japan and the United States. Europe, the Middle East, and Southeast Asia have become more important markets for Korean goods.

Home-Market Protection

Through policies of import substitution, export promotion, and screening foreign investment, the Korean Government has been actively involved in its foreign trade sector. This section on home-market protection examines Korean policies toward imports and foreign investment. Export promotion efforts through financial and tax mechanisms will be discussed later.

Imports

Korea's commodity imports increased 8 percent from 1982 to 1983 to \$26.2 billion. The United States and Japan remain Korea's largest trading partners, accounting for almost 48 percent of Korea's imports. (See Table 34.) The largest increases in Korean imports from 1982 to 1983 were in capital equipment (transport equipment increased 57 percent and electrical machinery and electronics increased 24 percent); the largest declines were in raw materials, due mostly to lower prices for coal and crude oil (see table 35).

Table 34.--Korea: Imports, by sources, 1982 and 1983

Source	1982	1983	Share of 1983 total imports	Share percent changes 1983 over 1982
	--Million U.S. dollars--		Percent	Percent
United States-----	5,955.8	6,274.3	24.0	5.3
Japan-----	5,305.3	6,238.4	23.8	17.6
Saudi Arabia-----	3,213.4	2,016.1	7.7	-37.3
Australia-----	912.9	970.8	3.7	6.3
Malaysia-----	609.6	777.3	3.0	27.5
Kuwait-----	819.2	692.3	2.6	-15.5
West Germany-----	680.3	649.8	2.5	-4.5
United Kingdom-----	402.8	468.0	1.8	16.2
Canada-----	485.0	444.4	1.7	-8.4
Singapore-----	165.9	401.1	1.5	141.8
Indonesia-----	682.5	387.2	1.5	-43.3
India-----	148.9	300.9	1.1	102.1
Taiwan-----	280.4	288.7	1.1	3.0
France-----	223.8	270.2	1.0	20.7
Ecuador-----	347.9	236.9	.9	-31.9
Hong Kong-----	244.4	221.2	.8	-9.5
Africa-----	678.2	789.8	3.0	16.5
All other-----	3,094.0	4,764.8	18.2	54.0
Total-----	24,250.8	26,192.2	100.0	8.0

Source: U.S. Embassy, Seoul.

Table 35.--Korea: Imports, by major commodity categories, 1982 and 1983

Category	1982	1983	Share percent changes 1983 over 1982
	Million U.S. dollars		
Crude oil-----	6,103	5,577	-8.6
Non-electrical machinery-----	2,359	2,610	10.6
Electrical machinery and electronics-----	2,075	2,569	23.8
Chemicals-----	1,320	1,551	17.5
Transport equipment-----	1,280	2,014	57.3
Iron and steel products-----	753	917	21.8
Coal-----	785	654	-16.7
Grains-----	937	1,104	17.8
Logs and lumber-----	642	627	-2.3
Raw cotton-----	529	534	0.9
Raw sugar-----	215	203	-5.6
Oils and fats-----	140	143	2.1
Soybeans-----	158	190	20.3
Total-----	24,251	26,192	8.0

Source: U.S. Embassy, Seoul.

Quantitative import restrictions.--Import restrictions were first used in Korea during its import substitution phase and later to improve its balance-of-payments position and to protect domestic industries. 1/ Direct bans on imports have gradually declined as Korea has liberalized imports as a means of increasing competition and improving domestic product quality and speeding technological innovation. However, Korea continues to maintain a licensing system, some import bans, and tariffs to protect key industries.

Imports are classified as either prohibited, restricted, or automatic approval (AA) as follows:

Prohibited category.--These items are usually products prohibited for reasons of public health or morals. This category may also cover items from specific origins. 2/

Restricted category.--Restricted items are predominantly luxury goods and items that are regarded as infant industry products. Such imports in the restricted category may also be subject to quotas. The Ministry of Trade and Industry (MTI) publishes lists of items included in the restricted category in annual export and import notices together with the procedures to be followed for their importation.

Most products not specifically prohibited can be imported into Korea. But import restricted items are subject to approval, and this creates a considerable barrier for potential importers. Issuance of import permits for restricted items typically requires the specific approval of the relevant industry association and are usually granted only when similar products are not produced domestically. The 1983-84 trade plan moved 305 items from the restricted list to the automatically approved (AA) list and 14 items from the AA to restricted. The 1984-85 trade plan moved 357 items from the restricted to the AA list, but moved no new items onto the restricted list.

Certain types of high-grade materials may be imported only if they are used for export production. However, the regulations provide for a "wastage allowance" ranging from 0.5 to 10 percent that need not be re-exported. 3/ Reportedly, some of the "wasted" materials are sold domestically.

Automatically approved category.--The only approval required for issuing a license to import goods in this category is from a foreign exchange bank. AA items are usually essential consumer goods not domestically produced, raw materials, and certain capital goods. 4/

1/ Protection of the home market is usually justified on the basis of the infant-industry argument. But in Korea, the concept of infant-industry has been used in the broadest fashion, and many established industries seem to qualify, for example, textiles. Wontack Hong, Trade Distortions, and Employment Growth in Korea, Seoul: Korea Development Institute, 1979, p. 96.

2/ International Trade Centre UNCTAD/GATT, The Republic of Korea; A Market for Products from Other Developing Countries, Geneva, 1983, p.17.

3/ U.S. Embassy, Seoul.

4/ International Trade Centre UNCTAD/GATT, The Republic of Korea: A Market for Products from Other Developing Countries, Geneva, 1983, p. 17.

Automatically approved import items can also become subject to certain measures that make them less than freely imported. The most significant of these measures is the "Surveillance system." Products on the surveillance list are not restricted from import but are monitored closely to determine their impact on the domestic market. Imports of surveillance items require approval from the Korea Traders Association for import licenses. After a period of surveillance, the products are either given AA status or returned to the restricted list. The 1983-84 annual trade plan reduced the total number of items subject to surveillance from 286 to 165 items. The 1984-85 trade plan further reduced the number to 127 by putting 74 items on the AA list and adding 36 new items. ^{1/}

Import Liberalization.--The Government of Korea began import liberalization in 1967 with the introduction of a "negative" list system (if a product is not on the list it can be imported) to replace a "positive" list system for the annual export/import schedule. Changing from a positive list to a negative list helped clarify what could not be imported. However, significant progress in liberalization did not occur until the mid-1970's when the Import Liberalization Deliberation Committee was established to help dismantle import restrictions. In accordance with the Committee's approach, Korea's import liberalization ratio (importable commodities as a proportion of total commodities defined by the CCCN 8-digit classification) ^{2/} increased from 52.7 percent in 1977 to 68.6 percent in 1978. However, the second oil crisis and the subsequent deterioration of Korea's balance-of-payments position halted further liberalization until 1981 (table 36). By 1983, Korea's import liberalization ratio increased to 80.7 percent (table 37). Table 38 shows this trend continuing to 1988 when the liberalization ratio is expected to be about 95 percent. The table also shows the industries most likely to be affected by the liberalizations.

In spite of the recent liberalizations, 1,203 products (out of 7,915 commodities) remain restricted from the Korean market. ^{3/} Moreover, the Ministry of Trade and Industry carefully monitors imports to insure that newly liberalized products do not reach unacceptably high levels in the domestic market. The approval system described above and its component part, the surveillance system, help the Korean Government regulate import flows.

Import Tariffs.--In addition to the restraints discussed above, tariffs remain a significant part of Korean trade policy. Since the mid-1970's, Korea has employed a comprehensive tariff regime both to protect domestic industry and to raise revenues. In some product categories, however, the import licensing liberalization program has been offset by tariff levels that effectively prohibit imports of newly liberalized items.

Since 1974, Korea has administered an annual flexible tariff plan, which includes such measures as emergency tariffs and tariff quotas, to control imports and prevent market disruptions resulting from trade liberalization measures. Under the flexible tariff plan, tariffs for certain products can be

^{1/} U.S. International Trade Commission, OTAP, 1983, p. 337.

^{2/} 'CCCN' is the Customs Cooperation Council Nomenclature.

^{3/} U.S. Embassy, Seoul.

quickly reduced or increased temporarily (usually for 6-months periods) to stabilize prices in the domestic market, to protect weak domestic industries, or to curb surges in imported luxury goods. 1/ Tariffs can be reduced under this plan when the industry is considered internationally competitive. In July 1984, 23 items were on the emergency tariff list. This included some products freed from nontariff barriers under the trade liberalization plan, and others that showed a sharp increase in imports. 2/ Concurrently, 29 items previously on the emergency list were returned to the lower general rates.

The 'tariff quota' component of the flexible tariff plan is used to stabilize domestic prices and to coordinate the supply and demand of raw materials and equipment. The plan permits tariff rates to be lowered on certain products until quota ceilings are reached, and then either a higher tariff rate goes into effect or the quota is increased. Under the flexible tariff plan for 1984, tariff rates were reduced on seven items until the quotas were reached.

Tariff export incentives.--Tariff incentives are also provided to favor exporters: 3/

Tariff drawbacks.--When a Korean firm imports raw materials or components for use in export products, it receives a rebate not only on the tariff paid on these imports, but also on the special consumption tax, the defense tax, and the value-added tax. These tariffs and taxes are supposed to be paid at the time of importation and rebated after the final product is exported. In practice, the importers usually take out a promissory note of 2 or 4 months which is then cancelled if the exports are made within the specified period; if not, the Korean firm must pay the tariff and taxes in cash upon maturity of the promissory note and collect its rebate at the time of export.

Tariff installment system.--Tariffs levied on the import of capital equipment designated by the Ministry of Finance may be paid in installments over a 2-5 year period if the equipment is used for manufacturing export goods.

Tariff Reform Measures.--Parallel to liberalizing quantitative restrictions in 1984, the Korean Government cut its major tariff regime to open the domestic economy to international competition and to prevent other countries retaliating by reducing market access for Korean exports. In addition to cutting tariffs, the reform package also reduced large rate differences between raw materials, intermediate products, and finished goods. The rate differences had been adopted during the 1970's to protect certain

1/ Emergency rates up to 40 percent above the general tariff rates may be imposed but the combined maximum rate cannot exceed 100 percent.

2/ U.S. Embassy, Seoul.

3/ Source: U.S. Embassy, Seoul, (A-27).

Table 36.--Korea: Import liberalization ratio and major economic indicators, 1977-84

	1977	1978	1979	1980	1981	1982	1983	1984
Import liberalization ratio-----percent--	52.7	68.6	68.6	68.6	74.7	76.6	80.7	84.8
Major economic indicators:								
GNP growth rate percent--	10.3	11.6	6.4	-6.2	6.4	5.3	9.5	<u>1/</u>
Wholesale price increases----percent--	9.0	11.6	18.8	38.9	20.4	4.7	0.2	<u>1/</u>
Current account balance : (million U.S. dollars):	12	-1,085	-4,151	-5,321	-4,646	-2,650	-1,600	<u>1/</u>
Trade balance-----do-----	-477	-1,781	-4,396	-4,384	-3,628	-2,594	-1,700	<u>1/</u>

1/ Not available.

Source: Republic of Korea, The Korean Economy: Opportunities and Prospects, March 1984, p. 25.

Table 37.--Korea: Number of Importable and Restricted Items

Item	1982	1983	1984
Total:	7,560	<u>1/</u> 7,915	7,915
Importable items-----	5,791	6,383	6,712
Restricted items-----	1,769	1,529	1,203
Import liberalization ratio-percent--	76.6	80.7	84.8

1/ Revised to reflect commodity reclassifications.

Source: Republic of Korea, The Korean Economy: Opportunities and Prospects, March 1984, p. 25.

Table 38.--Korea: Import liberalization schedule by industry

	Total	Restricted	Number of items to be liberalized			
			1985	1986	1987	1988
Primary products, food, and drinks.	1,386	336 (75.8)	29 (77.8)	31 (80.1)	-	-
Chemical goods-----	2,182	109 (95.0)	15 (95.7)	45 (97.8)	35 (99.4)	-
Steel and metal products---	802	58 (92.8)	17 (94.9)	31 (98.8)	6 (99.5)	-
Machinery-----	1,414	312 (77.9)	75 (83.2)	88 (89.5)	54 (93.3)	93 (99.9)
Electrical machinery, appliances, and electronics.	495	185 (62.9)	56 (73.9)	64 (86.9)	48 (96.6)	17 (100)
Textiles (including leather garments).	1,089	105 (62.6)	31 (93.2)	32 (96.1)	19 (97.9)	-
Others-----	547	98 (82.1)	9 (83.7)	17 (86.8)	12 (89.0)	-
Total-----	7,915	1,203 (84.8)	232 (87.7)	308 (91.6)	174 (93.8)	110 (95.2)

Source: Korean Government, Ministry of Finance.

Note.--Figures in parentheses denote import liberalization ratios in percent.

weak domestic industries. By eliminating the differences in protection for these industries, the Korean Government hopes to enhance Korea's international competitiveness and force domestic producers to improve their efficiency and the quality and price-competitiveness of their goods. 1/

The tariff reduction schedule announced in January 1984 will reduce general tariffs on 982 out of a total of 2,301 items over a 5-year period (1984-88). According to the 1984 schedule, tariff rates were reduced on 734 commodities, which lowered the average nominal rate to 21.9 percent from 23.7 percent in 1983. 2/ The 1984 nominal rate for manufactured goods was reduced from 22.6 percent in 1983 to 20.6 percent. Also as part of the reform, tariff exemptions for strategic industries, including the chemical, steel, electrical machinery, transportation equipment, and precision machinery industries, were abolished. 3/

The revised tariff system also provides the Korean Government with another mechanism to raise taxes temporarily. Under the new tariff system, an "adjustment tariff" can override an emergency tariff and impose temporary rates (in addition to the emergency tariffs already in effect) up to 100 percent to curb or prevent actual or expected surges in imports of items freed or soon to be freed from the restrictions. An adjustment tariff may be applied within 3 years of a product's liberalization date. 4/

Foreign investment

When the Korean Government began to protect and develop heavy and chemical industries in 1974, it placed restrictions on foreign equity participation. The levels of foreign investment consequently were lower than before 1974 until early 1980. 5/ In recent years, direct foreign investment, although increasing, has continued below levels desired by the Government. Since 1982 the focus of foreign investment has changed from the heavy machinery and chemical industries to consumer and services industries.

Revised Foreign Capital Inducement Law.--The Revised Foreign Capital Inducement Law (FCIL) of December 1983, effective July 1, 1984, is the first major revision of Korea's investment laws in more than a decade and marked a considerable liberalization in the foreign investment regime of Korea. However, the revised FCIL does not remove all the barriers to foreign investment. The FCIL is designed to encourage foreign investment through streamlined approval procedures and reduced restrictions. The main objective is to introduce more foreign competition into the market to increase product quality and industry productivity.

1/ Ibid. Under the revised system, tariffs on items which had been at the zero rate, such as metallic ores, and certain solid fuels, are raised slightly to help offset the revenue lost by lower overall tariff rates.

2/ Koo, op. cit., p. 19.

3/ Ibid.

4/ Ibid.

5/ Ibid., p. 13.

An important change introduced by the revised FCIL was a switch from a positive list system, which specified projects eligible for foreign investment, to a negative list system. The negative list specifies prohibited or restricted projects and reduces the previous ambiguous situation. The negative list is divided into a prohibited and a restricted list. The prohibited list includes 82 industries (10 manufacturing) and the restricted list contains 215 industries. Although no projects on the prohibited list will be considered for foreign investment, proposed projects in areas on the restricted list are reviewed by the Government and may be approved if the project seems likely to make a substantial contribution to Korea's economic development. 1/ The distribution of industries on the negative list (table 39) shows foreign investment is still discouraged in many primary and service industries; in the manufacturing sector, restrictions remain high in the food processing and paper industries. 2/

The revised FCIL and its implementing regulations, introduced an automatic approval system for projects not on the negative list and that meet certain conditions. The Ministry of Finance will grant automatic approval for projects that meet the following criteria:

(1) Foreign ownership is less than 50 percent. (However, in cases where the ratio of exports is above 60 percent, or where the importation of the same kind of products is liberalized and the tariff rates of those are below 10 percent, automatic approval is possible even if the foreign ownership ratio is above 50 percent.)

(2) The foreign investment amount is below US\$1 million.

(3) No request is made to receive tax exemption. (See the "Tax Policies" section for details on tax privileges offered under the Foreign Capital Inducement Act.)

(4) The foreign investment project is neither a prohibited nor a restricted project on the Negative List. 3/

1/ Government of Republic of Korea, Ministry of Finance.

2/ The total number of classified industries in Korea is 1,048. Among these, 49 industries were excluded because direct foreign investment in these areas is essentially impossible. Examples include government administration, educational institutions, and religious and political associations. In addition, 42 nonclassifiable industries have been excluded, leaving 957 industries for classification. Koo, op. cit., pp. 31-3.

3/ Government of Republic of Korea, Ministry of Finance, Investment Guide to Korea, Seoul, July 1984, p. 27.

Table 39.--Korea: Distribution of Industries on 1984
Negative List System 1/

Industry classification	Total number of industries <u>2/</u>	Number of industries not eligible for foreign investment
Agriculture, forestry, and fishery-----	39	34
Mining-----	24	12
Manufacturing-----	520	71
Food and beverages-----	67	27
Textiles and leather-----	71	6
Wood and Wood products-----	25	3
Paper and paper products-----	33	8
Chemicals, petroleum, rubber, and plastic products.	71	10
Nonmetallic mineral products-----	38	2
Basic metal industries-----	33	0
Fabricated metal products, machinery, and equipment.	151	14
Miscellaneous-----	31	1
Electricity, gas, and water supply-----	6	3
Construction-----	31	2
Retail and wholesale trade, Restaurants and hotels.	138	48
Transportation, warehousing, and communication.	46	37
Finance, insurance, real estate and business services.	61	40
Social and personal services-----	91	41
All other-----	1	1
Total-----	957	297

1/ Based on the 5-digit Korean Standard Industrial Classification System.

2/ Total does not include 49 industries, such as Government institutions and religious and political organizations, from the total of 1,048 items on most detailed classification of KSIC. 42 industries are omitted from the remaining 999 industries because they have not yet been assigned to appropriate ministries.

Source: Government of Republic of Korea, Ministry of Finance.

According to the Korean Government, almost all restrictions on capital and profit repatriation and reinvestment have been removed under the revised FCIL. Limits on other remittances, such as payment for trademarks, licensing or technology, have also been removed. In addition, foreign investors are provided further incentives to invest in Korea through exemption from almost all local taxes for up to 5 years and duty-free import of capital goods used in business.

However, substantial actual and potential barriers to foreign investment continue. First, the number of industries restricted from foreign investment will have to be reduced for the liberalization to be effective. The Korean Government has already made a step in this direction by establishing a review process for the negative list planned for every 6 months. This is expected to open a number of sectors. Secondly, only projects meeting the limited criteria specified above are automatically approved. For example, because all investments of any significance would likely be more than \$1 million, the automatic approval system really does not effect much investment. There are also restrictions on trademark licensing, i.e., there has to be a technology transfer component associated with the trademark before approval is granted. Another significant disincentive, according to some reports, is the perceived gap between official government policy and actual implementation of policy at the administrative level. Decisions made by bureaucrats in the government may be based on internal or unpublished regulations which are unfamiliar or unavailable to foreign investors, resulting in a substantial barrier to conducting business. Furthermore, working level bureaucrats reportedly sometimes interpret regulations in the narrowest possible way, thus discouraging the investment sought by policymakers. 1/ Foreign investors are also not eligible for subsidized credit unless they are in a high-priority industry or are part of a joint venture majority owned by Koreans. 2/

Another disincentive to foreign investment in some areas is a lack of patent protection which exposes investors to unauthorized copying of their products and processes. 3/ Under current law, only process (not product) patents for chemical compounds are permitted. Trademark laws are weak and enforcement is spotty. However, since 1980, the Government of Korea has made efforts to join the Patent Cooperation Treaty (PCT) and accordingly, may contemplate strengthening the Korean Patent Law with regards to product patents.

1/ To help rectify the problems resulting from conflicts between Ministries and regulations, the International Economic Policy Council was created in 1983 under the auspices of the Economic Planning Board (EPB). The major purpose of the Council is to handle complaints from foreign investors which result from inter-ministerial differences in policy interpretation.

2/ U.S. Embassy, Seoul.

3/ Ibid.

In spite of its shortcomings the revised FCIL liberalizations may be responsible, at least in part, for increased investment flows to Korea in 1983. Foreign investment approvals increased by 43 percent in 1983, from \$188 million in 1982 to about \$268 million in 1983 (see table 40). Although the Korean Government prefers joint ventures with foreign equity 50 percent or less, the volume of investments controlled by foreign interests has increased over the past 2 years (see table 41). This is particularly true of larger projects with a high-technology component. 1/

The Alien Land Law.--This law requires that firms with 50 percent or more foreign ownership receive approval from the Ministry of Home Affairs to buy land. Both foreign and domestic firms are prohibited from owning property not directly connected with business operations, and some companies have been required to sell such holdings.

Acquisition of existing businesses.--Acquisition of businesses by foreign interests are also regulated by the Korean Government. Foreign firms may buy into existing firms by acquiring newly issued stock or by subscribing to shares of newly formed corporations, and with the advent of the Korea Fund in mid-1984, can buy existing stock as well (however, this is for portfolio investors only; control of a company cannot be gained through the Fund). 2/ In addition, foreign companies may buy shares in a business held by other foreigners. Mergers among foreign-owned entities are possible only when foreign-owned shares are involved.

Export requirements for foreign investors.--Foreign-capital companies in targeted product areas were once required to export a significant share of their total production. This policy deterred foreign investment and forced the Government to reduce most export requirements, although they still remain high in a few sectors. For example, electronics manufacturers that are 100 percent foreign owned must export at least 50 percent of their production. 3/ Most joint ventures, however, can sell all of their production domestically, with certain exceptions, such as producers of speaker systems and home appliances, must export 50 percent and 30 percent, respectively. 4/ Korean electronics manufactures that import foreign brands and licensed technology are also required to export 50 percent of their total production. Producers which use Korean brands face no such restrictions.

1/ U.S. Embassy, Seoul, A-8, p. 6.

2/ The Korea Fund Inc., incorporated in the United States in May 1984, is a diversified, closed-end investment company. The Fund's investment objective is long-term capital appreciation through investment in securities of Korean companies. The initial offering of the Fund was 5 million shares.

3/ David Rearwin, "The Korean Challenge: An Overview of Korean Government Trade and Industrial Planning and Strategy," unpublished paper, Seoul, August 1983, p. 32.

4/ Ibid.

Table 40.--Korea: Foreign equity investment, by industries (approvals), 1982 and 1983 1/

Industry	1982	1983	Cumulative 1982 through 1983	Percent of total
	-----1,000 dollars-----			
Agriculture and fisheries	1,250(2)	1,149(1)	15,015(42)	.9
Agriculture/forestry	150(1)	770(1)	6,693(23)	.4
Fishery	1,100(1)	379(-)	8,322(19)	.5
Mining and manufacturing	122,342(45)	102,879(58)	1,128,711(807)	66.2
Mining	554(1)	270(1)	3,087(13)	.1
Manufacturing	121,788(44)	102,609(57)	1,125,624(794)	66.1
Food processing	10,646(4)	5,928(5)	48,735(27)	2.9
Textiles	2,987(-)	1,940(-)	69,801(67)	4.1
Wood products	-	-	1,113(3)	.1
Fertilizers	-	-	41,975(4)	2.5
Pharmaceuticals	24,162(10)	20,784(8)	41,975(4)	2.5
Chemicals	41,321(8)	7,594(5)	59,372(32)	3.5
Petroleum	-	-	326,942(113)	19.2
Ceramics	128(-)	654(3)	15,041(25)	.8
Steel and metals	2,936(4)	1,788(5)	65,020(72)	3.8
Machinery and parts	9,824(2)	5,725(9)	95,325(130)	5.6
Electrical products and electronics	19,212(6)	41,368(13)	262,855(191)	15.4
Transport equipment	7,664(1)	13,835(1)	66,566(9)	3.9
All other	2,908(9)	2,993(8)	41,344(117)	2.4
Social overhead capital and other services 2/	64,199(8)	163,725(16)	560,472(107)	2.9
Total	187,791(55)	267,753(75)	1,704,198(956)	100.0

1/ Figures in parenthesis indicate number of new projects.

2/ Includes banking, construction and services, electricity, transport and storage, and tourism.

Source: Republic of Korea, Ministry of Finance.

Table 41.--Korea: Foreign Equity Investment Approvals by Industry and by size of Foreign Ownership, as of August 1983 1/

Industry	(in millions of dollars)					
	Total	1 to 49 percent	50 percent	51 to 99 percent	100 percent	
Agriculture and fisheries-----	15.0(42)	8.5(32)	2.75(5)	1.4(4)	2.5(1)	
Agriculture/forestry-----	6.7(23)	3.9(15)	1.4(4)	1.4(4)	-	
Fishery-----	8.3(19)	4.6(17)	1.3(1)	-	2.5(1)	
Mining and manufacturing-----	1,287.7(807)	236.1(332)	401.2(248)	164.1(106)	327.2(121)	
Mining-----	3.1(13)	1.7(7)	0.4(1)	-	.9(5)	
Manufacturing-----	1,125.6(794)	234.4(325)	400.8(247)	164.1(106)	326.4(116)	
Food processing-----	48.7(27)	8.6(14)	16.5(7)	21.7(4)	1.9(2)	
Textiles-----	69.8(67)	8.5(41)	23.1(13)	36.0(8)	2.1(5)	
Wood products-----	1.1	0.2(2)	0.1(1)	-	.9(-)	
Fertilizers-----	42.0	17.7(1)	24.3(3)	-	-	
Pharmaceuticals-----	59.4(32)	5.3(6)	20.7(15)	30.1(10)	3.2(1)	
Chemicals-----	326.9(113)	36.2(47)	175.4(50)	9.9(13)	105.4(3)	
Petroleum-----	31.5(4)	0.8(1)	30.7(3)	-	-	
Ceramics-----	15.0(25)	7.2(13)	-	4.3(7)	3.5(5)	
Steel and metals-----	65.0(72)	17.5(32)	12.4(23)	21.2(7)	13.9(10)	
Machinery and parts-----	95.3(130)	32.0(62)	29.7(35)	6.2(12)	27.4(21)	
Electrical products and electronics-----	262.9(191)	63.8(58)	15.8(62)	22.0(23)	161.3(48)	
Transport equipment-----	66.6(9)	14.1(3)	45.9(2)	5.8(1)	0.8(3)	
All other-----	41.3(117)	22.4(45)	6.1(33)	6.9(21)	5.9(18)	
Social overhead capital and other services-----	560.5(107)	159.5(43)	113.3(40)	41.6(17)	246.2(7)	
Banking-----	90.7(11)	62.0(6)	27.7(4)	1.0(1)	-	
Construction and services-----	72.6(41)	12.3(19)	14.3(13)	1.4(4)	44.5(5)	
Electricity-----	3.4(2)	3.4(2)	-	-	-	
Transport and storage-----	31.4(15)	12.9(5)	11.9(8)	6.6(2)	-	
Hotel and tourism-----	362.4(38)	68.8(11)	59.3(15)	32.6(10)	201.7(2)	
Total-----	1,704.2(596)	404.1(407)	517.1(293)	207.0(127)	576.0(129)	

1/ Figures in parenthesis indicate number of new projects.

Source: Republic of Korea, Ministry of Finance.

Export quotas, are also applied to Korean manufactures which are authorized to sell foreign goods or use licensed foreign trademarks. As shown in table 42, these quotas vary by sector and are usually higher if the foreign trademark is independent of a Korean trademark.

Table 42.--Korea: Export quotas, by selected industries, 1983

(In percent)				
Industry	:	Combined	:	Foreign
	:	mark quota	:	mark quota
	:		:	
Electronic machinery and components.	:	70	:	80
Electrical products and supplies—	:	20	:	30
Footwear-----	:	20	:	30
Textile products-----	:	25	:	25
Soap-----	:	30	:	30
	:		:	

Source: David Rearwin, op. cit., p. 50.

Local content requirements.--Korea has regulations which frequently require specific levels of local content. These regulations permit a new domestic manufacturer of most products to petition the Government to ban competing imports. When such petitions are granted, the Government forces companies to shift to the new domestic-made substitutes as they appear on the market.

Tax Policies

Table 43 shows Korean central government tax revenues for 1983. Indirect taxes (alcohol, value added, and specific commodity taxes) accounted for about 38 percent of national revenue. Direct taxes accounted for about 20 percent. The balance of national revenue consisted of customs duty, monopoly profits, defense surtax, and minor items.

The Korean Government aids some industries through tax policy. Although tax incentives to promote the development of specific industries have been sharply reduced since 1982, incentives remain for six strategic industries: naphtha cracking, steel, industrial machinery, electronics, shipbuilding, and aviation. 1/ Until 1982, firms in these industries were allowed a choice of the following incentives: (1) exemption from corporate taxes for the first 3 years after the establishment of the plant and a 50-percent reduction of corporate taxes for the following 2 years; or (2) tax credits of 8 to 10 percent of the invested amount; or (3) accelerated depreciation of up to 100 percent of the normal depreciation allowances. 2/ Since 1982, the above-mentioned alternatives have been withdrawn, and only the accelerated

1/ Koo, op. cit., p. 35.

2/ Ibid., p. 14.

Table 43.--Korea: Central Government tax reserve, 1983

	Value	Percent of total
	Million won	
Direct tax:		
Industrial income tax-----	1,136.1	11.3
Corporation income tax-----	863.7	8.6
Indirect tax:		
Alcohol-----	441.0	4.4
Value added tax-----	2,559.3	25.4
Specific commodity tax-----	793.3	7.9
Stamp tax-----	64.2	.6
Carry-over from previous year-----	109.3	1.1
Other internal tax-----	221.5	2.2
Customs duty:		
KFX import duty <u>1</u> /-----	1,283.6	12.7
Other including carry-over-----	179.6	1.8
Education surtax-----	263.1	2.6
Monopoly profits-----	830.0	8.2
Defense surtax-----	1,336.5	13.3
Total-----	10,081.2	100.0

1/ KFX imports are Korean foreign-exchange imports.

Source: The Bank of Korea, Monthly Bulletin, July 31, 1984, p. 67.

depreciation option is still available to these industries. However, the industrial machinery and electronics industries continue to have a choice between tax credits of 3 to 5 percent of the invested amount or accelerated depreciation. 1/

Tax incentives are also provided for investments by small and medium firms, for technology and manpower development, and for overseas investments by small and medium firms. These incentives are in the form of accelerated depreciation, treatment of reserves for various purposes as losses, and for exemption from income taxes. 2/

The Korean Government also offers an array of tax incentives for exporters and export activities. Special accelerated depreciation is provided

1/ Ibid., p. 35.

2/ Ibid., p. 36.

for plants and equipment used for making exported products. Exemption and drawback from customs duties may also be obtained for imports of materials and capital equipment to be used to make exports. 1/

Value-added tax (VAT).--The rate of the VAT on export goods and for earnings derived from overseas services and overseas construction is zero.

Special consumption tax.--There is an exemption from the consumption tax (5 to 100 percent) for exported goods.

Special depreciation allowances.--At present, Korean firms with export earnings amounting to more than 50 percent of total income are allowed to increase their normal depreciation by 30 percent. Equipment used for overseas business including construction and plant exports receives the same benefit. Firms whose exports account for less than 50 percent of total income can claim some accelerated depreciation determined by a formula based on the firms' foreign-exchange earnings and total business earnings:

$$(\text{Regular depreciation} \times 30 \text{ percent}) \times \frac{(\text{Foreign exchange} \times 2)}{\text{Total income}}$$

Duty-Free Export Zones.--There are two free exports zones in Korea: the Masan Free Export Zone near Pusan and the Iri Free Export Zone in North Cholla Province. To qualify for entrance into one of these zones, enterprises must produce exclusively for the export market, but this restriction is to be eased. Companies operating in the zones can be either foreign- or Korean-owned companies.

Several benefits are provided to firms located in the duty-free export zones. These benefits are designed primarily to encourage foreign investment. They include:

- a. Exemption from tariffs, defense tax, special consumption tax, and VAT on all imports of raw materials, capital goods, and semi-finished goods;
- b. Exemption from corporation tax, property tax and property acquisition tax for the first five years, (Applicable only for the portion of the foreigner's investment which was approved under the Foreign Capital Inducement Law.);
- c. Zero rate of the VAT on exported output;
- d. Exemption from taxes on dividends and surplus distribution accruing to foreign investors during the first five years;

1/ Roy Hofheinz and K. Calder, The Eastasia Edge, New York: Basic Books, 1982.

- e. Exemption from income taxes during the first five years on salaries of foreigners having specified job experience or academic backgrounds; (This exemption is not intended to promote exports, but to develop technology. Foreign employees who work in a company selling its products to the domestic market enjoy the same benefit.)
- f. Loan terms that are generally available to exporters in Korea;
- g. Free import of raw materials and capital equipment for the manufacture of export products;
- h. Exemption from inspection procedures for export products;
- i. Simplified customs procedures;
- j. Access to industrial infrastructure facilities.

Corporation Tax.---The following corporation tax benefits are provided in connection with exports:

- (1) costs related to the exploitation of overseas markets may be treated as an expense for tax purposes;
- (2) the cost of maintaining the mandatory (1 percent of foreign exchange earnings), and similar mandatory reserve funds for export losses (1 percent of foreign exchange earnings) and price changes (5 percent of year-end inventory assets) may also be treated as an expense for tax purposes.
- (3) the export of construction services, industrial plants and overseas ports services receive similar benefits such as reserve funds for potential export losses (2 percent of foreign exchange earnings), and taxable income reduction on export earnings (2 percent of foreign exchange earnings).

Table 44 shows current rates of corporation tax.

Table 44.--Korea: Rates of corporation tax,
by specified income levels, 1981-83

Corporation type	Taxable income of			Taxable income in		
	W50 million or less			excess of W50 million		
	1981	1982	1983	1981	1982	1983
Widely-held <u>1</u> /-----	25	22	20	33	33	30
Closely-held <u>2</u> /-----	25	22	20	40	38	33
Nonprofit-----	20	20	20	27	27	27

1/ Listed on Korean stock exchange.

2/ Not listed on the KSE.

Source: U.S. Embassy, Seoul, A-27; p. 6.

Tax privileges under the Foreign Capital Inducement Law.--As an incentive to encourage foreign investment, the Korean Government may approve requests for tax benefits for foreign-invested projects meeting certain criteria for contributing to the development of the national economy. These projects are categorized as follows: 1/

(1) A project contributing significantly to improving the international balance of payments.

(2) A project accompanied by advanced technology or large amounts of capital.

(3) A project invested in by a non-resident Korean national in accordance with the Law concerning the Registration of Non-resident Korean Nationals.

(4) A project located in a Free Export Zone in accordance with the Free Export Zone Establishment Law.

(5) Any other project designated by Presidential Decree as a project for which tax reduction or exemption is essential in order to induce foreign investment.

1/ Source: Republic of Korea, Ministry of Finance, Investment Guide to Korea, p. 48.

Under the FCIL, a foreign investor may choose either a direct tax exemption or a special depreciation. Investors selecting the 5-year tax exemption may choose the period of corporate and dividend income tax exemptions from any consecutive 5-year period within 10 years from registration of the enterprise. 1/ Tax exemptions and special depreciation are calculated as follows: 2/

o Income tax or corporation tax on a foreign-invested enterprise shall be exempt in proportion to the ratio of the stock or shares owned by foreign investors to the stock or shares of the enterprise concerned.

o Income tax or corporation tax on dividends accruing from the stock or shares acquired by a foreign investor shall be exempt up to the income occurring for five years, after the tax year commencing following the registration of the foreign-invested enterprise.

o Acquisition tax and property tax on the properties acquired and held by a foreign-invested enterprise shall be exempt for five years from the date of registration in proportion to the foreign investment ratio of the enterprise concerned only when the properties were acquired and held after the registration of the enterprise has any property before the registration for the original purpose of the project concerned, acquisition tax and property tax shall be exempt for five years from the date of acquisition of the properties in proportion to the foreign-investment ratio of the enterprise concerned.

o Foreign employees are fully exempted from personal income tax for five years after the registration of the enterprise.

o An amount equal to 100 percent of the ceiling of allowable depreciation calculated as determined by income tax law, or corporation tax law, multiplied by the foreign investment ratio shall be incorporated into necessary expense or expense as special depreciation for calculating the taxable income for each tax year up to the amount invested by a foreign investor.

o Special depreciation expense may be incorporated into necessary expense or expense from the tax year commencing first following the registration of the foreign-invested enterprise.

1/ Ibid.

2/ Ibid., p. 49.

Financial Assistance

Korea's financial sector consists of a central bank, the Bank of Korea, commercial banks, specialized banks, and a wide range of nonbank financial intermediaries that includes: (1) development institutions, including the Korean Development Bank, the Export-Import Bank of Korea, and the Korea Long-term Credit Bank, (2) savings institutions, including finance companies and credit unions, (3) life insurance companies, and (4) investment companies, including merchant banking corporations, investment trust companies, and the Korea Securities Finance Corporation (fig. 1). 1/

In addition, there are a few institutions that do not fall into the above categories, but either conduct business similar to financial businesses or engage in business closely related to financial institutions. These include the National Investment Fund, the Korea Credit Guarantee Fund, the Korea Technology Development Corporation, leasing companies, and nonlife insurance companies. 2/

The relative size of selected financial institutions is shown in table 45 below.

Table 45.--Korea: Assets of selected financial institutions, as of end of Sept. 30, 1982

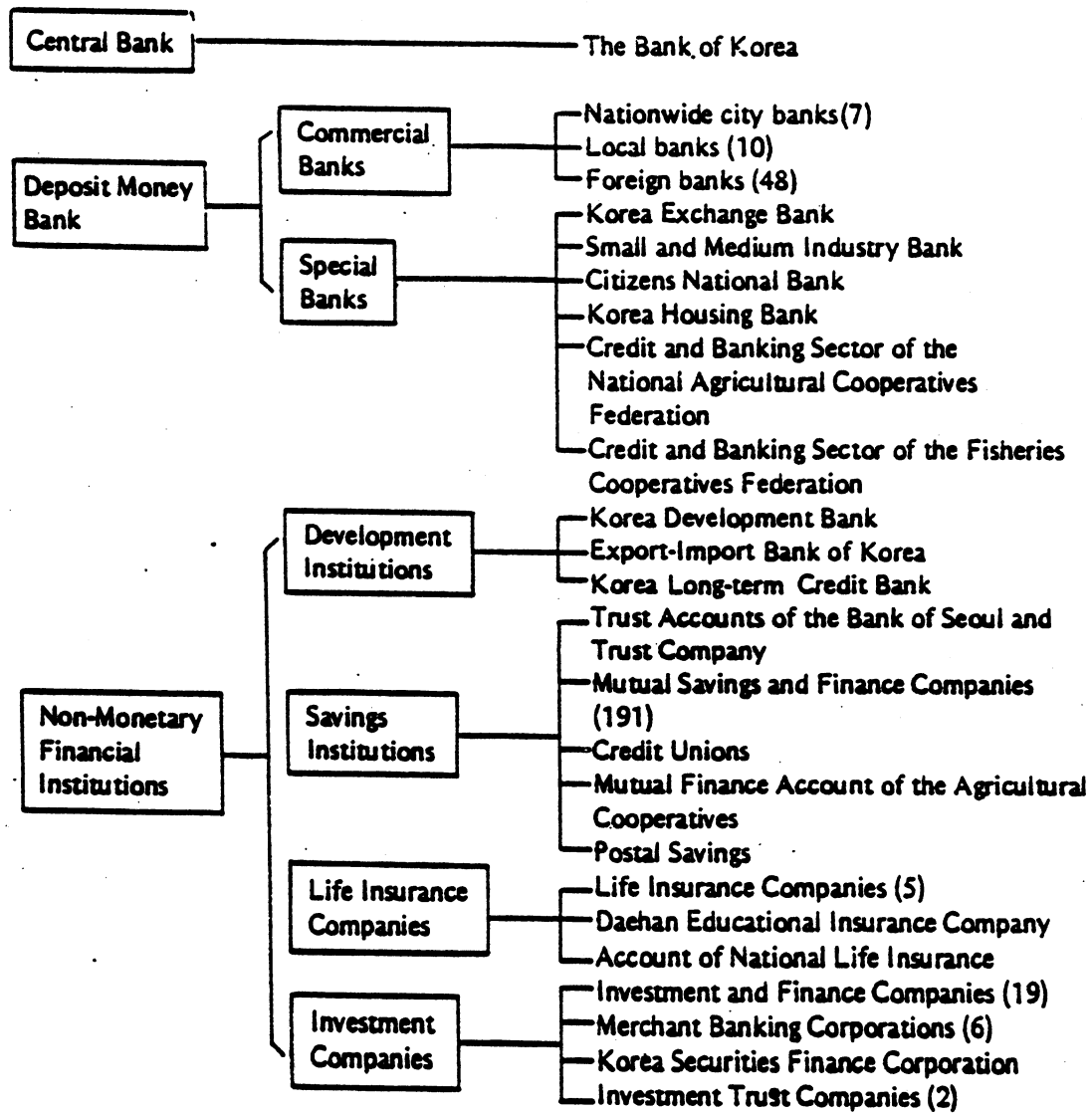
Institution	Amount
	(Billion won)
Bank of Korea-----	9,362.1
Nationwide commercial banks (6)-----	16,455.1
Local banks-----	2,784.4
Foreign Banks-----	3,406.5
Korea Exchange Bank-----	11,146.6
Medium Industry Bank-----	2,309.3
Korea Development Bank-----	10,082.6
Export-Import Bank of Korea-----	1,803.3
Korea Long-Term Credit Bank-----	750.2
Korea Credit Guarantee Fund-----	1,895.1

Source: Bank of Korea.

1/ Bank of Korea, Financial System in Korea, Seoul, March 1983.

2/ There is also an unofficial money market or "curb" market, which consists of professional money lenders who make or arrange loans to business borrowers at rates higher than those permitted in the official market. The curb market developed in response to a demand for credit in excess of supply. The Government has attempted to reduce the importance of the curb market by reducing restrictions on the official financial market.

Figure 1.—Korea: Financial Institutions in Korea.



Source: Bank of Korea, 1984.

Note.—Figures in parentheses denote the number of institutions as of the end of 1983.

Commercial banks.--Five of Korea's commercial banks are among the largest financial institutions in Korea, second only to the specialized banks. Until 1980, the Korean Government was the major stockholder in these banks and exercised strong administrative control over the distribution of funds. Because of strong government control, the development of the financial sector has not kept pace with the rest of the economy. In response to this situation, the Fifth 5-year plan emphasizes liberalization and modernization of financial institutions and the capital market as major objectives. The Government plans to gradually turn over its shares in the national commercial banks to the private sector and rely on the market mechanism and indirect controls (e.g., reserve requirements), to regulate the industry. 1/

Commercial banks in Korea raise funds through international loans, deposits from the general public, and through borrowings from the Bank of Korea. Most of their lending activity is concentrated in short-term loans or discounts.

Foreign exchange 2/.--The foreign-exchange business of banking institutions is regulated by the Foreign Exchange Central Act (FECA) of 1962. 3/ Any banking institution wishing to engage in foreign-exchange business must be authorized as a foreign-exchange bank by the Ministry of Finance. Before the FECA, foreign exchange was handled exclusively by the Bank of Korea.

Foreign-exchange banks are classified into two groups, Class A and Class B, according to the scope of their foreign-exchange business. Class A banks can conduct almost any kind of normal foreign-exchange business; Class B banks are restricted to domestic foreign-exchange business only. Class B banks, therefore, are not permitted to hold foreign currency in foreign countries or establish arrangements with foreign banks, but may open accounts with Class A banks to settle their external transactions. All commercial banks are authorized as Class A foreign-exchange banks, but as the authorization is given on an office by office basis, some branch banks may not handle foreign-exchange business.

Foreign banks in Korea operate as Class A banks with certain restrictions. They must have at least 3 billion won as initial capital, and may increase such funds only with the approval of the Bank of Korea. In addition, if these banks incur a deficit or their total assets in Korea fall below their total business funds, supplementary funds must be provided within 60 days after the close of the fiscal year either through their home office or from their reserves. Disposal of net profits other than for the accumulation of reserves are subject to Bank of Korea approval. Foreign banks in Korea are also subject to restrictions on the amounts of their foreign-exchange funds.

1/ Ministry of Finance (MOF), Investment Guide to Korea, p. 52.

2/ Source for this information on foreign exchange banks is the Bank of Korea, The Financial System in Korea.

3/ Ibid., pp. 26-8.

Foreign banks are allowed special funds for loans to foreign-invested and joint-venture firms. 1/ Foreign banks in Korea are now required to reserve 35 percent of total loans for small- and medium-sized businesses. 2/

Specialized banks.--In the early 1960's, Korea began to introduce specialized banks into its financial system to finance underdeveloped or strategically important industries. Each specialized bank was established with its own specifically defined purpose to compliment functions of commercial banks. These banks are supervised by the Government pursuant to their enabling legislation, but like commercial banks, they follow Bank of Korea regulations on interest rates and reserve requirements. The specialized banks receive most of their funds from the Government in addition to funds raised from sales of debentures and private sector deposits.

The six specialized banks and their markets are (1) the Korea Exchange Bank (Korea's largest commercial bank) specializing in foreign-exchange transactions and trade financing; (2) the Small and Medium Industry Bank, concentrating on smaller sized companies; (3) the Korea Housing Bank, making housing loans to individuals; (4) the Citizens National Bank providing short-term credit to individuals and small companies; (5) the National Agricultural Cooperatives Federation, specializing in agriculture and forestry development loans; and (6) the Central Federation of Fisheries Cooperatives funding the fishery business. 3/

Development institutions

The Korea Development Bank (KDB).--The Korea Development Bank was established in 1954 to supply long-term credit for major industries. During the late 1950's, the KDB concentrated on the rehabilitation of industrial facilities destroyed during the Korean War. The bank currently specializes in supporting development projects in major industries and industrial infrastructure. The bank's loans are concentrated in the development of electric power, coal mining, shipbuilding, iron and steel, and other major industries designated by the Government. 4/ The KDB also subscribes and underwrites corporate stocks and debentures and makes payment guarantees to help finance major industrial projects. Preferential or subsidized interest rates on KDB loans were discontinued in 1982. The KDB also engages in foreign-exchange business and operates special funds such as the Shareholding Administration Fund, the Industrial Rationalization Fund, and the Energy Rationalization Fund. The share of KDB loans to heavy and chemical industries increased from 24.3 percent in 1972 to 47.1 percent in 1980. In 1983, KDB's share of these loans decreased to 41.5 percent. 5/

Export-Import Bank of Korea (KEXIM).--Established in 1976, the KEXIM bank is the principal source of subsidized medium- and long-term import financing. KEXIM provides loans ranging from 6 months to 20 years maturity to both

1/ MOF, Investment Guide to Korea, p. 54.

2/ FOREX Service, October 1984, vol. 60, No. 10, p. 28.

3/ Bank of Korea.

4/ Bank of Korea, Financial System in Korea, p. 56.

5/ Koo, op. cit., p. 39.

suppliers and purchasers to finance commodity exports, technical services overseas, overseas investment, and natural resources development. Since May 2, 1983, the bank also finances Korean-made equipment for overseas construction activities.

Until 1983, most of KEXIM resources have financed overseas purchases of ships and investments of Korean firms investing abroad. Presently, the bank plans to diversify its lending. The average annual interest rate on KEXIM loans is 9 percent compared with 10 to 10.5 percent for ordinary loans, and as such are a form of preferential financing. (Terms and conditions by type of loan are shown in table 46.) A total of 628,105 million won (\$859 million) was committed in KEXIM loans in 1982, of which 90 percent was supplier credits. Of the Bank's 1983 loan commitment target of 880 billion won, a total of 779 billion won, or 88.5 percent, will be export credits. 1/ KEXIM loans can cover up to 90 percent of the export contract amount. KEXIM also provides information on export markets and credit risk assessments, and loans for import of certain raw materials to be used in export products.

Korea Long-Term Credit Bank

The Korea Long-Term Credit Bank (formerly the Korea Development Finance Corporation, incorporated in 1967) was established as a financial intermediary in 1980 to meet the growing demand for long-term credit. The bank's major activity is the extension of medium- and long-term loans for both purchasers of equipment and working funds. At the end of September 1982, the bank's assets stood at 750.2 billion won, and loans totaled 610.3 billion won. 2/

Other financial institutions

National Investment Fund.--The National Investment Fund (NIF) has played a significant role in the development of strategic industries in Korea. The NIF was established in 1974 "to secure and supply the investment and loan funds needed to promote the construction of major industries, including the heavy and chemical industries, as well as to increase exports." 3/ NIF funds were available to all businesses in strategic industries at preferential interest rates until the 1970's. The low-cost financing was provided for purchases of domestic machinery and domestically produced ships, construction of domestic heavy machinery plants, and exports on deferred payment. 4/ In 1982, preferential interest rates were officially abolished for most major NIF loans. Still receiving preferential interest rates, however, are public housing loans (8 percent interest rate), national housing lottery fund loans (4 percent interest rate), and funds for irrigation (5.5 percent interest rate), compared with 10 to 10.5 percent commercial market rates.

1/ U.S. Embassy, Seoul.

2/ Bank of Korea, Financial System in Korea, p. 59.

3/ National Investment Fund Act (Law No. 2635).

4/ Koo, op. cit., p. 13.

Table 46.--Korea: Terms for Korean Export-Import Bank Loans -
Medium- and long-term Export Finance, 1984.

Type of loans	Interest rate	Maximum loan	Maximum loan
	per annum	ceiling	period
	---Percent---	---Percent---	
Commodity exports and technical services credit.	9	70-90	6 months to 10 years.
Overseas investment credit.	LIBOR plus <u>1</u> /		70 years.
7 to 10 years	1		
Major resources development credit.	9	70	20 years.
Import of raw materials: for deferred payment exports. <u>2</u> /	9	80	2 years.
Overseas constructions and services credit- for the procurement of locally made equipment. <u>3</u> /	9	70	2 years to 5 years.

1/ The London Interbank Offered Rate.

2/ As of May 1983, no commitments have been made for the type of loan.

3/ Effective May 2, 1983.

Source: U.S. Embassy, Seoul.

Currently, NIF loans go primarily to the heavy, chemical, electronics, and electric power industries, and to agricultural projects. These funds are provided at variable long-term interest rates through such intermediaries as the Korean Development Bank, the Export-Import Bank of Korea, and banking institutions. 1/ (See table 47). Since NIF funds have been allocated primarily through development institutions, NIF loans account for only a small proportion of total lending for the commercial and specialized banks. Total funds provided through the NIF increased substantially until 1982, when the Government began to cut back loans. As shown in table 48, the NIF provided 606.7 billion won in funds in 1981 (54.9 percent of these funds went to the heavy and chemical industries), 730 billion won in 1982 (61 percent to heavy and chemical industries) and 732.6 billion in 1983 (65 percent to heavy and chemical industries).

The size of the National Investment Fund was reduced by about 25 percent in 1984 to 550 billion won. Of this amount, 67.3 percent is planned for allocation to the heavy and chemical industries, and 18.2 percent is planned for exports on a deferred payment basis. 2/ Further reductions in the size of the NIF are planned in coming years.

Korea Credit Guarantee Fund (KCGF)

The KCGF was established in 1976 to provide credit guarantees for certain businesses unable to obtain financing from financial institutions. 3/ The fund also provides credit information, management and technical assistance, and guarantees the repayment of loans, discounts, commercial bills, and corporate debentures.

The limit of guarantees per business is 1 billion won for large businesses, 800 million won for small to medium businesses, and 100 million won for a very small business. 4/ The fee for the credit guarantee is 1 percent per annum for the amount guaranteed. By yearend 1983, the total outstanding credit guarantee amounted to 1,310.2 billion won for over 19,000 firms. 5/ At least 40 percent of KCGF guarantees must go to small- or medium-sized business.

1/ Bank of Korea, Financial System in Korea, p. 67. In 1983, the share of NIF total outstanding loans to the Korea Development Bank, the Export-Import Bank of Korea, and the Korea Long-Term Credit Bank was 29.8 percent, 19.4 percent of total NIF outstanding loans was held by the Export-Import Bank of Korea, Koo, op. cit., p. 40.

2/ Bank of Korea.

3/ Eligible businesses include mining, manufacturing, utilities, construction, some services, and businesses involved in the development of overseas resources.

4/ Korea Credit Guarantee Fund.

5/ Ibid.

Table 47.--Korea: Share of NIF loans in total outstanding loans by banking institutions, 1974-83

Institution	(In percent)											
	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983		
Commercial Banks 1/	0.6	1.5	3.1	4.3	4.4	4.0	3.4	3.0	2.9	2.9		
Specialized Banks 2/	1.3	3.0	3.8	4.1	4.3	4.1	3.2	3.1	3.5	4.2		
Development Finance Institutions 3/	9.5	19.2	27.6	29.8	35.7	36.8	31.3	30.6	26.1	24.5		
Korea Development Bank	9.6	20.2	28.0	29.6	37.2	37.8	33.8	34.3	33.2	29.8		
Export-Import Bank of Korea	.0	.0	23.1	32.0	22.7	26.5	16.3	15.5	15.3	19.4		
Total	2.2	5.0	7.6	9.2	10.5	10.8	9.7	9.4	8.9	8.7		

1/ Comprises 7 nationwide commercial banks, 10 local banks, and foreign banks' operation in Korea.

2/ Comprises the Korea Exchange Bank, the Small and Medium Industry Bank, the Citizens National Bank, the Korea Housing Bank, the Credit and Banking Sectors of the Agricultural, Fisheries, and Livestock Cooperatives.

3/ Comprises the Korea Development Bank, the Export-Import Bank of Korea and Korea Long Term Credit Bank.

Source: Koo, op. cit., p. 40.

Table 48.--Korea: Actual National Investment Fund Allocation, by sectors, 1974-83

Sector	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Heavy and chemical industries----- percent---	58.5	49.6	56.4	61.2	63.0	64.9	60.8	54.9	61.0	65.0
Purchase of domestic machinery : percent---	6.2	5.3	14.9	7.9	8.3	7.9	9.4	10.5	21.5	30.9
Construction of machinery : factories-----do-----	13.2	10.1	6.1	14.0	11.7	10.0	4.0	3.5	5.4	2.5
Planned shipbuilding-----do-----	4.9	4.9	3.3	8.2	6.4	7.4	12.5	15.9	16.8	18.7
Defense industries-----do-----	4.5	9.3	6.8	7.6	7.5	6.5	9.0	11.6	5.6	6.4
Other heavy and chemical : Industries-----do-----	34.6	20.0	25.4	23.5	29.0	33.2	26.0	13.3	11.6	6.0
Agriculture-----do-----	14.0	9.2	10.9	4.2	3.9	4.5	5.0	6.4	6.2	6.1
Power industries-----do-----	22.5	34.9	22.4	20.8	24.2	22.7	27.4	26.4	19.2	5.5
Saemaul factories-----do-----	5.0	3.9	4.7	1.5	1.1	1.1	-	-	-	-
Exports on deferred payment : basis-----do-----	-	-	-	-	-	-	-	-	-	-
Total-----do-----	100	100	100	100	100	100	100	100	100	100
Total sectors----- billion won---	75,407	123,706	178,542	240,738	380,299	439,810	438,415	606,696	730,003	732,590

Source: Bank of Korea.

Note: Because of rounding, figures may not add to the totals shown.

In 1983, credit guarantees were provided for 11,422 manufacturing businesses, amounting to over 72 percent of the total. Metal assembly, machinery and equipment making businesses received the highest portion of manufacturing guarantees, (table 49).

Table 49.--Korea: Credit guarantee, by categories of businesses, 1983

Type of business	Number of firms	Amount	Ratio
		billion won	--Percent--
Manufacturing-----	11,422	944.4	72.1
Textiles, clothing-----	3,828	199.1	15.2
Paper, paper products-----	661	71.4	5.4
Chemicals, coal, petroleum, rubber.	1,192	173.1	13.2
Primary metal products-----	248	58.5	4.5
Metal assembly machinery-----	2,530	234.4	17.9
Others-----	2,963	207.9	15.9
Construction-----	1,215	150.7	11.5
Wholesaling and retailing trade.	4,893	146.2	11.1
All other-----	1,505	68.9	5.3
Total-----	19,035	1,310.2	100.0

Source: Korea Credit Guarantee Fund, Annual Report, 1983, p. 8.

Korea Technology Development Corporation (KTDC).--The KTDC was established in 1981 to promote the technical development of private enterprises. About \$200 million is planned for investment in this corporation between 1981, and 1984--\$14 million by the Korean Government, \$86 million by the private sector, and \$100 million through a World Bank loan. 1/ Projects eligible for KTDC financial support are R&D activities for the development of new products and the improvement of existing ones, the import of new technologies, and the manufacturing and marketing of new products. As of September 30, 1982, total assets in the KTDC amounted to 12.9 billion won. 2/

Other financial assistance

The Korean Government has established a vertical supply system between small business and large manufacturers. The Linkage Promotion Act of 1975 was promulgated to establish financial and technical cooperation between small and large firms. MTI has designated 1,553 industrial products (mainly auto parts and components) for inclusion in a system that makes large producers dependent upon small companies for supplies. Under the program small firms agree to supply products on a long-term contractual basis, and large firms are required to provide technical and development assistance. The joint agreement is submitted to MTI for approval.

1/ Republic of Korea, Ministry of Science and Technology, Introduction to Science and Technology in The Republic of Korea, Seoul, 1984, pp. 36-7.

2/ Bank of Korea, Financial System in Korea, p. 70.

About 1,053 small companies have been designated as eligible to participate in the program and about 300 large companies are involved. As an incentive to join the linkage promotion scheme, large companies that purchase from small- and medium-sized firms under the program, qualify for financial support from the small and medium business bank. Interest for these loans is 8 percent for a 5-year repayment schedule with a 3-year grace period.

In the past, small- and medium-sized enterprises have been neglected by the Government in terms of access to new production technologies, loans, and information. ^{1/} To remedy this situation, the current 5-year economic plan emphasizes the development of small and medium enterprises. The plan calls for Government support to promote the modernization and development of facilities through tax and loan policies. MTI has also restricted certain industries, for example auto parts and components, to small- and medium-sized businesses only.

The Korean Government also plans to restructure the Small and Medium Industry Promotion Corporation to allow for more efficient utilization of its resources. Efforts for cooperation among small and medium enterprises, such as joint plant facilities, will also be supported by the Government. To this end, and to provide financial support, the Korean Government plans to increase its funding of both the Small and Medium Industry Promotion Fund and the Small and Medium Industry Bank by about 200 billion won by 1986. ^{2/}

Loans to exporters.---Through the domestic financial structure, the Korean Government provides short-, medium-, and long-term financial instruments which give preference to Korean exporters over firms that produce only for domestic consumption. Before June 28, 1982, Korean exporters received a lower interest rate for the short-term won currency export loans than domestic market operations received for similar loans. Now, all commercial won bank loan interest rates are 10 percent and the preferential interest rates for exporters no longer exist. Following are some examples of financial assistance provided by the Government to exporters:

- (1) Short-term won currency export loan.---90 day loans provided at a 10 percent annual rate for various purposes related to commodity exports, including production expenses, domestic procurement of finished goods, and procurement of raw materials.
- (2) Short-term foreign currency loans for overseas construction and services.---Similar to (1) above including 10 percent annual interest rate. The difference is in the range of purposes for which loans can be obtained and the type of documentation required.

^{1/} A small or medium- business is defined as one with 300 employees or less.

^{2/} Ibid., p.54.

- (3) Short-term won currency loans for export of agricultural and marine products.---These loans finance the collection or stockpiling of certain agricultural and marine products destined for export. Interest is 10 percent and maturity is as high as 240 days for certain products.
- (4) Medium/long-term foreign currency loans for imported capital equipment and raw materials.---Banks dealing in foreign exchange (Class A commercial banks) are authorized to use foreign currency funds (within a ceiling) to help companies finance the import of capital goods and raw materials for certain industries, including export, industries, defense and other high-priority sectors. 1/ For imports destined for defense and heavy/chemical industries, maturities are up to 10 years with 4 years grace allowed; others are limited to 3 year maturities and 1 year grace period. In certain cases loans may be up to 100 percent of the import amount. Interest rates authorized by the Government for this type of loan are as follows: 3 years or more--LIBOR (London Interbank offered rate) plus 1.5 percent; and less than 3 years--LIBOR plus 1.0 percent. 2/

Special Export Promotion Fund.---A special import surcharge of 0.24 percent is collected on all imports into Korea, except those for the Korean Government, defense industries, or re-export. Revenues from this surcharge are placed in a Special Export Promotion Fund controlled by the Korea Traders Association for use in a wide range of export promotion activities. 3/ In 1983, 24.4 million won, about \$31.5 million, was collected from the import surcharge. Export promotion activities included donations to quasi-government organizations such as the Korea Trade Promotion Corporation and the Korean Institute for Industrial Economics and Technology. Donations were also made to trade fairs, exhibitions and other market development programs.

Preferential treatment for General Trading Companies (GTC).---Korea's system of General Trading Companies (GTCs) was created and sponsored by the Government to expand exports. 4/ The first Korean GTCs (based on the Japanese model), were created in 1975 to consolidate the fragmented trading structures and to develop overseas markets and marketing techniques. GTC status is conferred on firms that account for at least 2 percent of total Korea's exports in the previous year, have exported at least 4 items earning more than \$1 million, and have 20 or more branches overseas (examples of GTC's are Daewoo, Samsung, and Hyundai). In 1984, nine Korean firms were designated GTC status.

1/ See section on banks.

2/ U.S. Embassy, Seoul.

3/ Activities include donations to quasi-governmental agencies such as Korea Trade Promotion Corporation and the Korean Institute for Industrial Economics and Technology, and other market development programs.

4/ The Economist Intelligence Unit, Ltd., Toward the Pacific Century, p. 63.

Until 1980, designating a company as a GTC provided certain benefits beyond those generally allowed to exporting firms, including:

- (1) priority when the Korean Government controls competition among Korean firms in international bidding;
- (2) special benefits with regard to membership in exporters' associations;
- (3) unlike other Korean firms, GTC's are allowed to use standby letters of credit as a revolving credit account;
- (4) exemption from "end-users requirement" regulations which require that imports of certain items must be accompanied by certificate documenting an immediate end-user need for the item.

Since 1980, the GTC designation has provided no special benefits except the prestige of the GTC label. Part of the reason for the withdrawal of benefits to the GTC's was due to the overall poor financial structure of many of the conglomerates in Korea (see "cartel and merger" section).

Science and Technology Assistance

Government support for research and development

The Korean Government has committed substantial resources to research and development. In addition to supporting research institutes directly, Korea encourages private investment in technological development by offering financial and tax benefits.

Tax benefits include tax credits for technology development reserve funds and development expenses, tax and tariff exemptions for sample or experimental machinery and equipment used for technical development, tax credits for investments to commercialize newly developed technologies, and tax exemption for royalties from technology sales. 1/ Incentives offered to businesses to encourage R&D include financial support and tax advantages on imports of research and development equipment. Incentives to individuals include exemption from military service for R&D personnel. 2/

The Fifth 5-year Plan has set as goals for science and technology development continued expansion of high-level technological manpower, increased R&D productivity, introduction of progressively advanced technology, and localization of key industrial technologies. In accordance with its plans

1/ Koo, op. cit., p. 46.

2/ Republic of Korea, Economic Bulletin, "Special Supplement to 1983 Economic Management Plan", Mar. 4, 1983, No. 83-03, p. 15.

for science and technology development, the Government has projected that by 1986, investment in science and technology will have increased from 0.9 percent of GNP (in 1980) to 2.0 percent; patent registration will increase from 1,251 cases to 5,000 cases; technical manpower will increase from 736,000 to 1,044,000; and engineering and software technology exports will increase from \$122 million to \$1 billion. 1/

Both the Korea Development Bank and the Small and Medium Industry Bank provide loans for technological development for longer-than-usual loans. Other Government institutions providing loans or equity investments for technology investment are the Korea Technology Development Corporation, the Korea Technology Advancement Corporation, and the Korea Development Investment Corporation. These loans and investments are available to all industries. 2/

The Korean Government also provides financial assistance to nine Government-supported research institutes supervised by the Ministry of Science and Technology (MOST). These include the Korea Institute of Machinery and Material (for the development of technology pertaining to machinery, metals, and shipbuilding); the Korea Institute of Electronics Technology (for the development of technology pertaining to semiconductor and computer industries); and the Korea Advanced Institute of Science and Technology (for the research and development of national projects). 3/ In addition, the Government encourages private companies to establish their own R&D institutes through tax incentives and financial support. The Government recommends large companies establish at least one research center per company; small and medium companies are encouraged to organize research consortiums by specific fields. 4/

Government financing is also allocated to joint research projects between the public and private sectors called "National research and development projects." These projects involve development of technologies which the private sector would not develop alone because of high capital requirements and risks. The special projects cover many sectors, such as, macroelectronics, computers, machinery, textiles, and energy. In 1983, 182 research projects of 131 industrial firms were selected as national R&D projects. About \$28 million was donated by the Korean Government to these projects. 5/ The Korean Government plans to invest 35.7 billion won in seven special projects that include semiconductors and bioengineering research. The Government also plans to target the plant engineering industry for special support.

1/ Republic of Korea, Ministry of Science and Technology, Introduction to Science and Technology in The Republic of Korea, Seoul, 1984, p. 22.

2/ Ibid.

3/ Other institutes are the Korea Advanced Energy Research Institute, the Korea Standards Research Institute; the Korea Institute of Energy and Resources; the Korea Research Institute of Chemical Technology; the Korea Electrotechnology and Telecommunications Research Institute; and the Korea Ginseng and Tobacco Research Institute.

4/ Republic of Korea, Ministry of Science and Technology, op. cit., p. 21.

5/ Ibid., p. 32.

The Korean Government also provides small and medium industries with financial support for R&D from the small and medium Industry Banks. Technical support is also provided from the Government research institutes. About 30 percent of the funding needed for R&D by small and medium businesses comes from the firms and 70 percent is loaned by the Government on a success-conditional basis. So far, Government expectations for increased private sector investment have not been met, and private Korean firms continue to make only modest investments in R&D.

Technology sharing

An important objective of the Korean Government is to develop a local telecommunications industry capable of competing internationally by regulating foreign participation and by investing resources in the industry. Over the next 5 years, the Korea Telecommunication Authority (KTA) plans to increase spending on telecommunications development from \$2.4 billion in 1983 to \$3.3 billion in 1986. To promote technical transfer, the Korean Government requires that foreign companies accept local partners for 33-percent ownership. The foreign company must also allow them to service and eventually manufacture their equipment under license. 1/

As mentioned previously, the Korean Government is also promoting plant engineering services. Most major industrial plants constructed in Korea since the 1960's have been with foreign loans on a turnkey basis. Thus local engineers had few opportunities to participate and acquire expertise. In response to this situation, the Government enacted the Engineering Promotion Law in 1973 to encourage domestic engineering services by supporting small firms. 2/ Tax incentives are provided to small firms to encourage them to merge and specialize. Engineering firms and plant exporting companies are encouraged to acquire technology and experience from foreign firms.

Assistance in acquiring foreign technology

MOST has initiated a program--The Shuttle Research Program--to invite approximately 5,000 overseas Korean scientists and technicians to Korea to participate in a high-technology industry promotion program. In addition to this, MOST helps new high-technology businesses acquire more technologies by financing training of their researchers overseas. 3/

1/ International Telephone and Telegraph Corp. is teaming with Samsung, and Gold Star Semiconductor Ltd. (AT&T's local partner) is going with the Lucky Group. Other joint ventures include a technology exchange agreement between Northern Telecom Ltd. and Daewoo, and a partnership between Sweden's L. M. Ericsson and Oriental Precision Co. These joint ventures and licensing agreements are also supposed to serve U.S. interests by providing a Pacific base to compete with the Japanese in the Asian market. David Rearwin, "The Korean Challenge: An Overview of Korean Government Trade and Industrial Planning and Strategy," unpublished paper, Seoul, August 1983, pp. 16-7.

2/ MOST, op. cit., p. 38.

3/ Ibid., p. 44.

A "shuttle research program" is planned for use in the construction and electronics industries. Top quality foreign electronic experts, including Korean nationals living in the United States, will be recruited to work in Korean electronics companies located in the United States. Korean companies based in the United States will also be able to acquire foreign technology, purchase state-of-the-art equipment, enter into cooperation agreements with foreign companies, and obtain manpower training. Ultimately, the plan is that the new technology will be transferred back to Korea. 1/

A major effort taken by the Korean Government in 1982 was to establish the Korean Development Investment Co. (KDIC), the first Korean venture capital corporation. KDIC provides financing to high-tech businesses and small- and medium-sized firms engaged in research and development. The Korea Technology Development Corp. and the Korean Technology Advancement Corp. also provide financing for R&D.

The Korean Government provides research and development assistance directly to specific industries. For example, in 1982, after years of neglect, the Government decided to channel \$300 million each year over the next 5 years into modernizing and increasing textile production facilities. The textile industry is under the control of the Korea Federation of the Textile Industry (KFTI). In 1983, however, the Ministry of Trade and Industry announced that it would not allow expansion in certain sectors such as chemical fiber, spinning and weaving, and fabric manufacturing facilities, but rather it would provide incentives for firms wishing to update or replace obsolete facilities. 2/ This provision only applied when these firms produced textiles to compete in the international market. 3/

Cartel and merger policy

Korea's economy is dominated by about 50 large business conglomerates (also referred to as chaebol) that affect the production and marketing of practically every product in Korea. (For example, Samsung produces products such as bread and aircraft engines; Lucky-Goldstar, toothpaste and microchips; and Hyundai, autos, ships, housing, and furniture). 4/ Net sales of the 50 largest chaebol was about \$66.25 billion in 1983. In terms of value-added share, these 50 companies produced the equivalent of 20 percent of Korea's total production of goods and services. 5/

When the regime of President Chun assumed power in 1980, the fragile financial structure of the leading chaebol came to light. Although the chaebol received about one-third of the total credit available from commercial

1/ Ibid.

2/ Textile World, April 1982, p. 7.

3/ David Rearwin's unpublished paper, op. cit., p. 21

4/ "A Precarious Industrial Structure," Far Eastern Economic Review, July 19, 1984, pp. 43-4.

5/ Ibid.

banks and most of the funds available from specialized banks at preferential interest rates, they were chronically short of cash yet possessed vast property holdings. 1/ In response to the weak financial status of 26 leading chaebol, the Government imposed its "Business Rationalization Measure" to force the chaebol to liquidate their assets in order to repay bank loans. The Monopoly Regulation and Fair Trade Law of 1981 was also promulgated to help control the chaebol. To date the rationalization has not succeeded in restructuring Korean industry and it remains highly centralized. 2/ Also, the chaebol remain very much in debt. The average debt equity ratio, of the chaebol in 1984 was 4.5 compared with 3.6 for the entire manufacturing sector. 3/

The Monopoly Regulation and Fair Trade Law.--In the past, the Korean Government has encouraged the formation of manufacturers' cartels. However, the Korean Government is trying to eliminate cartel arrangements, price fixing, and other monopolistic practices in accordance with the Fair Trade and Anti-Monopoly Act enacted in April 1981. The Monopoly Regulation and Fair Trade Law prohibits collusive activities by monopolistic firms, competition-limiting activities, and other specified unfair trade practices. Industry trade associations, whose primary purpose before 1980 was to restrict competition, have been prohibited from engaging in many of their former activities.

The Korean Government still permits mergers and joint activities when appropriate and has even initiated them. 4/ For example, beginning in 1980, the Government tried with limited success to rationalize through merger six industries: automobiles, heavy electrical equipment, power generation, copper smelting, marine diesel engines, heavy electrical equipment, and electronic switching systems (used in telecommunications). At the time, each of these industries faced severe financial difficulties and the Government hoped to establish industry leaders.

The Office of Fair Trade (OFT) within the Economic Planning Board, is charged with the responsibility of developing anti-trust and fair trading policies and investigating violations of the law. OFT also has the authority to order corrective measures against violations. 5/

1/ Ibid.

2/ Ibid.

3/ Ibid.

4/ Koo, op. cit., p. 44. The cement cartel, composed of six manufactures, allowed Korean cement manufacturers to sell their product domestically at much higher prices (\$57-\$58 per ton in 1983) than in export markets (\$37-\$38 per ton). The Government's intent to boost exports and abolish the cartel was against the wishes of the manufacturers which earned a greater profit domestically. Rearwin, op. cit., p. 24.

5/ In 1983, OFT handled 190 cases of unfair trade practice and 120 cases as of August 1984. Since 1980, the office has decided on 561 applications for mergers involving plan mergers, selling of main facilities/factories, buying stock, transfer of personnel, and establishment of new companies. Only 19 of the 561 applications were rejected. Republic of Korea, Office of Fair Trade.

Temporary employer cartels.--Due to the shortage of skilled workers in Korea, particularly in electronics, the Electronic Industry Association of Korea (EIAK) has established a temporary coordinating committee to prevent the unfair recruitment of skilled workers from competitors that EIAK feared would occur as new conglomerates entered the electronics business in Korea. The Government did not oppose EIAK. Also the Government has acceded to overseas construction industry efforts to reduce competition among Korean firms when demand in overseas construction markets lessened.

Wage controls.--The Korean Government has used wage controls to help maintain the competitiveness of Korean products in international and domestic markets. 1/ A wage council was formed in June 1983 to assist in implementing the Economic Planning Board's wage guidelines, which are intended to lower Korean wages to levels existing in rival exporting countries.

Targeting Techniques for Specific Korean Industries

Automobiles

The Korean Government has designated the auto industry a "strategic export industry." Auto manufacturers, like other so-designated industries, will receive priority access to the Republic of Korea's limited credit facilities and other export incentives. Also, automobiles and auto components are on the restricted product import list and require prior approval by the Korean Auto Industrial Cooperative (KAIC) trade association before licenses are approved, "in accordance with the supply and demand situation in Korea." Consequently, import licenses are rarely issued and the domestic industry is effectively protected from imports.

Since 1966, Korea has protected its home auto market and stimulated domestic production by requiring a certain proportion of local content, varying from 20 to 90 percent. (Today, most cars have 60 to 95 percent local content.) Korea also limits foreign ownership investment to 50 percent in an auto manufacturing facility.

In 1981, the Government tried unsuccessfully to merge three major carmakers (Hyundai Motor Co., Kia Industrial Co. and Saehan Motor Co.) in order to rationalize the industry. Under one restructuring plan, the Daewoo group was to give up one-half of its auto company and take over Hyundai's heavy construction and power generating equipment business. Saehan and Hyundai were then to merge into a single company. Kia was to exit from the passenger car business and concentrate on trucks. 2/ The merger was not successful because the companies involved could not agree on the terms. 3/ Saehan Motors later became Daewoo Motors under another restructuring plan in which General Motors reduced its equity in Saehan to 50 percent and gave management control to the Daewoo group.

Korea's vehicle industry is composed of nearly 600 parts manufacturers and 6 major assemblers. The largest company is Hyundai; followed by Daewoo Motors. Hyundai has connections with Mitsibishi and Ford, and Daewoo is a

1/ Rearwin, op. cit., p. 23.

2/ Koo, op. cit., p. 48.

3/ Business Week, Oct. 13, 1981, pp. 56-57.

50/50 joint venture with General Motors. Korea is not yet a major exporter of automobiles but it is reportedly making plans to break into the U.S. auto market with Daewoo and Hyundai cars. ^{1/} To date, most exports go to Africa, Latin America, and the Middle East. European countries receive about 25 percent of Korea's auto exports.

Computers, semiconductors, and telecommunications

The computer and semiconductor industries in Korea were designated as "strategic industries" by the Government in the early 1980's. Consequently, these industries have received a number of incentives to promote growth and development such as import protection, and Government support for R&D, credit allocations, tax breaks, and exemptions from military service for research employees.

Import restraints.--The Government has established criteria for importing computers into Korea. Imports of medium and larger sized computers are permitted, whereas imports of small personal computers have been banned since 1982. In this way, the Government hopes to encourage foreign suppliers to participate in manufacturing computers in Korea through technology transfer or through making computer parts in Korea. As a possible consequence of this policy, 23 foreign manufacturers have made technical agreements with Korean firms since 1980.

The import criteria for computers are determined by a computer import committee in the Electronics Industry Association of Korea and are subject to revision as market conditions dictate. The criteria have been changed gradually to allow for the import of some small computers.

Financial incentives.--Long-term, low-interest financing is available for the small- and medium-sized companies' R&D, primarily from the Electronics Industry Promotion Fund. The amount is \$2.5 million to be shared by 30 to 40 electronics companies. Loans are repayable over 3 years, after a grace period of 2 years at an interest rate of 6 percent per annum. Loans are available from the National Investment Fund, repayable over 10 years after an initial grace period of 2 to 3 years, at an annual interest rate of 10 percent. In addition, the Korean Government will provide up to 270 billion won to the semiconductor industry by 1986 under the Semiconductor Industry Fostering Plan introduced last year. ^{2/} These loan funds are to be accompanied by a wide range of tax breaks for the industry.

The Korean Institute of Electronics Technology (KIET) conducts basic research in semiconductor and computer systems. In 1983, its budget was \$20 million. The Korean Technology Development Cooperation (KIDC), established in 1981 to facilitate financing for R&D, finances the development of new technologies, products, and processes. A total of \$70 million will be invested; \$8 million by the Government to cover research and development costs from 1981 to 1984. The KIDC and the Korea Development Bank have a major role in the development of new technologies, products, and processes and have granted the electronics industry (including computers and semiconductors), top

^{1/} See John Burgess, "South Korea Eyes U.S. Auto Market," The Washington Post, Oct. 7, 1984, F-1.

^{2/} "Out of the Laboratories and into the Factories," Business Korea, vol. 2, No. 2, August 1984, p. 27.

priority in benefiting from loans and incentives. Loans for investment by these and other Government institutions increased from \$101 million in 1982 to \$173 million in 1983.

Incentives to encourage R&D.---In 1982, the Korean Government began joint research programs between the public and private sectors for high risk projects in which the Government shared the costs. Of 180 such projects selected in 1983, the computer and semiconductor industries had 19 projects for a total of 6.1 billion won (\$7.6 million) funding. The Government contributed 60 percent of the cost and the private sector contributed 40 percent. 1/

Thirty-one other high risk projects were singled out for concentrated Government subsidies, preferential credits, and other incentives. The projects to be developed under Government supervision for R&D are (1) medium-size computers and peripherals, (2) cable telecommunications equipment, (3) industrial electronics, including numerically controlled devices and robotics, (4) medical equipment, (5) computerized video tape recorders, (6) digital IC, and (7) computer software.

Training programs have also been established to assure an adequate supply of highly trained specialists. The Semiconductor and Computer R&D Investment Plan also envisages training 1,360 people in semiconductor-related fields, and 820 in computer-related fields during the period of the plan.

Heavy electrical equipment

As part of its energy plan, the heavy electrical machinery industry has been targeted by the Korean Government for promotion and rationalization. The main thrust of the energy plan and the heavy electrical machinery industry's future is in the nuclear energy area. Without any domestic oil or gas production, Korea is entirely dependent upon imported fuels for its energy. Hence, to maintain its industrial growth, the Government has introduced a large nuclear power program with plans to build a total of 46 nuclear plants by the year 2000. The Government has anticipated that 31 percent of the country's total energy needs will be provided by nuclear generation by 1986, 56 percent by 1996, and 63.4 percent by the year 2000. 2/

The Ministry of Energy and Resources (MER) is responsible for administering a 5-year R&D program covering a wide spectrum of industries related to energy. It has a budget of 50 billion won (\$65.7 million) to help develop a Korean standard nuclear power plant and major equipment such as reactors and turbines.

Rationalization of the industry is considered important because in 1980, the industry was experiencing severe overcapacity problems (capacity utilization was only 40 percent). Hence, the Government intervened with a rationalization plan to restructure the industry. The Government merged three heavy electrical equipment producers (Hyosung, Kolong, and Ssayong) to encourage specialization and reduce duplication of effort.

1/ U.S. Embassy, Seoul. A-24 Airgram, July 5, 1984, p. 11.

2/ National Economic Development Office, Heavy Electrical Machinery SW, The International Civil Nuclear Industry, London, March 1983, p. 19.

Currently, Korean heavy electrical equipment products account for only 4 percent of Korean export construction orders because Korean contractors tend to favor foreign-made equipment.

Machine tools

The Korean Government began promoting chemical and heavy machinery industries by enacting the Machine Industry Promotion Act of 1967. In 1982, the Government designated the metalworking machine tool industry as a strategic export industry. Under the Machinery Industry Development Program, the Korean Government offers a wide variety of incentives to upgrade tooling and to expand production, including subsidized loans, tax exemptions and reductions, import protection (the Korea Machine Tool Industry Association approves imports after certifying that no import license application involves products manufactured locally), and other incentives to selected firms. Low-interest loan programs extended to manufacturers help finance facility renovation and expansion. A series of special-purpose Government funds and loan programs promote demand for machine tools. These include the Local Machinery Procurement Fund (\$260 million), the Korean Development Bank Fund (\$97.4 million), the Medium Industry Bank Fund (\$260 million), and the Industrial Facility Procurement Fund (\$127 million). Principal users of 1983 National Investment Fund allocations are to be the Local Machinery Procurement Machinery Plant Construction Funds (totaling \$287.7 million), Deferred Payment Financing Programs (17 percent), and the electric power industry (18 percent).

Special funds which provide R&D assistance to the machinery industry include the Technical Development Support Fund (\$78 million) and the Korea Technical Development Corp's Fund (\$80 million). Loans from all these funds are usually repayable over 8 to 10 years, after an initial grace period of 2 to 3 years, at an annual interest rate of 10 percent. The loans are used to finance 70 to 90 percent of the total investment undertaken by the beneficiaries. Purchasers of a variety of machinery equipment, including machine tools, are also eligible to receive these incentives.

The Korean Government has also promoted industrial growth by creating a series of industrial complexes for more efficient support of manufacturing activities. For example, the Changwon Industrial Complex for the machinery industry was established in 1974 and the Panwol Complex was established in 1978. Both of these complexes are designed to encourage small- and medium-sized manufacturers.

Machinery products attaining a certain proportion of local content receive Government protection from foreign competition in the form of import restrictions and tariffs. Other support includes rebates for imported raw materials used in export goods and accelerated depreciation.

The electric tool industry has particularly been targeted to increase its local content. To this end, the Ministry of Trade and Industry plans to encourage local manufacturers to acquire new technology by entering into joint ventures with foreign firms.

According to the 1982-86 economic plan, the Korean Government plans to provide incentives to support growth and to develop a high degree of self-sufficiency in the machinery industry. The plan calls for investments of

\$3.4 billion in the machine industry sector. According to the plan, these investments will raise annual output from \$5.6 billion in 1981 to \$14.7 billion in 1984, and raise exports from \$2.4 billion to \$11.6 billion during the same period. Credit will be expanded for exporting machinery, and for industrial plants on a deferred-payment basis. Small firms producing parts and components will receive Government support to promote growth, and production specialization will be strongly encouraged. 1/

Pharmaceuticals

The Korean Government requires foreign pharmaceutical companies to disclose certain proprietary information relating to their products as a precondition to permitting products on the Korean market. Some foreign industry sources have alleged that the proprietary information submitted to the Ministry of Health and Social Affairs has been made available to Korean manufacturers which are then able to copy and produce the product at lower cost, because they avoided the R&D expenditures. Patent laws (process patents only, not product patents) in Korea are easily circumvented with the result that local producers need only change a process slightly while copying a foreign drug to avoid breaking any law.

The Korean Government has indicated a desire to rationalize the pharmaceutical industry by reducing the number of small firms and making large firms more competitive. To this end, a Good Manufacturing Practice approval program (GMP) has been established. After 1985, companies with GMP approval will receive tax advantages and other benefits not conferred on other companies. 2/ Small firms are expected to have difficulty acquiring GMP approval while the larger, more competitive firms are expected to benefit.

The Government also plans to allocate more R&D funds to pharmaceutical-related projects. Public funding will increase from 2 billion won (\$2.5 million) in 1984 to 3 billion won in 1985. 3/

Shipbuilding

Since 1973, Korea's shipbuilding industry has grown from infancy to one of the world's most dynamic export industries. Today, Korea supplies 10 percent of all new ships, and is second only to Japan in share of world production. Most of the industry's success can be attributed to Government policies designed to build up the country's heavy industry.

Government support to the shipbuilding industry is primarily through providing low-cost loans to producers and through subsidizing the export-finance system. To rationalize the industry and address problems of excess capacity, the Government recently induced about 70 shipping companies to merge into 20 large firms.

1/ Fifth Five-Year Economic and Social Development Plan: 1982-86, p. 48.

2/ "Industrial South Korea," Far Eastern Economic Review, July 17, 1984, p. 45.

3/ Ibid., p. 46.

The subsidized co-financing program of the Korean EXIM bank has been a major instrument in the industry's growth. The provision of low-cost financing to Korean shipyards and long-term, low-cost financing to purchasers has helped win customers from Europe and Japan. 1/ In the current 5-year development plan, the Government plans to increase the financial resources available for exporting ships on a deferred-payment basis. 2/

Steel

The Korean steel industry has emerged over the past decade as the fourth largest exporter of steel in the world. The rapid growth of the industry is attributed to a combination of Government financial aid, alleged subsidies and other fiscal incentives, allocation of low-cost credit, foreign assistance, and protection from imports. 3/ The Korean steel industry is considered one of the most important of the country's basic industries by the Government because of its strategic and defense importance. For these reasons, Korea's only integrated steel mill, the Pohang Iron and Steel Co. (POSCO), is eligible for various types of administrative and financial support from the Korean Government. However, major assistance, including tax exemptions, tariff reduction, and financial support by NIF, were abolished at the beginning of 1983.

In many of the antidumping and countervailing duty investigations conducted by the U.S. Department of Commerce involving Korean steel products since 1977, dumping and subsidization were not found to exist or were found to be de minimis (table 50). In those cases where subsidies or dumping were found, the levels ranged from 0.9 percent to 5.0 percent of the import price.

Construction of POSCO's new facility at Kwangyang has already begun and should be completed in late 1987. Financing for the facility is supposedly free of Korean Government support; 65 percent of the cost will come from POSCO and the remainder will come from foreign bank loans and equipment supplier loans. 4/ Kwangyang's private sector owners expect to invest additional capital in further modernization of Korea's steel production facilities.

POSCO's ownership is divided among the Government-owned Korea Development Bank (40 percent), the Korean Government (30 percent), and commercial banks and private companies (30 percent). Most other steel producers in Korea, which include producers of pipe and tube, sheet, wire and wire products, and other steel products, have no known Government ownership.

Textiles and apparel

The Korean Government has intervened in its apparel industry using nontariff barriers and financial incentives to build up the domestic industry and increase exports. However, since 1983, the barriers have been

1/ International Economic Review, June 1984, p. 13.

2/ Fifth Five-Year Economic and Social Development Plan: 1982-86, p. 48.

3/ Verner, Liipfert, Bernhard, and McPherson, Chartered, "The Rise of Steelmaking in the Developing Countries: State Intervention in the Market and its Effect on International Trade in Steel," Washington, DC, 1984, pp. 97-98.

4/ International Business and Economic Research Corporation, Korean Steel in Perspective, Washington, DC, 1984, p.9.

Table 50.--Korea: Summary of significant trade actions ^{1/} affecting Korean steel products, 1977-83

Product	Year	Action	Dumping or Subsidy Allegation	Results
Wire rope---	1977	AD	More than 50 percent	Negative, no sales at less than fair value.
	1982	AD	18-32 percent	Negative, no sales at less than fair value.
Wire nails---	1979	AD	14 below Trigger Price	Negative, no sales at less than fair value.
	1981	AD	30 percent	Affirmative, weighted-average margin, 3.8 percent.
	1982	CVD		Negative, no subsidy.
Pipe and tube.	1982	CVD	30 to 40 percent	Affirmative, de minimis, zero deposit rate for 98 percent of imports investigated. Subsidies found to range from 0.1-88 percent.
	1983	AD	30 to 40 percent	Affirmative weighted average margin-- 0.9 percent for circular pipe and 1.46 percent for square and rectangular tubing. Two of five companies excluded from finding based on no sales at less than fair value.
Plate-----	1982	CVD	30 to 40 percent	Affirmative, subsidy of 1.88 percent.
	1983	AD	64 percent	Affirmative by Commerce of 5.0 percent.
Hot-rolled sheet and galvanized sheet.	1982	CVD	30 to 40 percent	Affirmative subsidy. 1.36 to 1.88 percent.
Cold-rolled sheet.	1982	CVD	30 to 40 percent	Negative, no injury

^{1/} Antidumping (AD) actions address allegations that a producer sells a steel product in the U.S. market at unfairly low prices. Countervailing duty (CVD) cases allege the producer is unfairly subsidized.

Source: International Business and Economic Research Corporation, "Korean Steel in Perspective," Washington.

progressively reduced and the industry no longer receives special financial incentives. As of mid-1984, 94 percent of all apparel items are on the automatic approval (AA) list. Import licenses are still subject to prior approval of the trade association, and transactions tend to be complicated and expensive.

In 1982, the Government began encouraging new investment in textiles to improve quality in output and efficiency in production. Manufacturers are encouraged to invest in top-quality equipment and technology. Particular emphasis is placed by the Government on the dyeing industry. Recently, the Government helped establish two industrial complexes for dyeing and is planning three more by 1986. 1/

The Government also provides low-interest loans for textile plant modernization and replacement of obsolete equipment. During 1984, about 30 million won will be lent for these purposes. 2/ In addition, a Textiles Modernization Fund (funded by private and public sectors) will grow to 120 billion won (\$149.6 million) by 1986. 3/

1/ Far Eastern Economic Review, July 19, 1984, pp. 63-64.

2/ Ibid.

3/ Ibid.

MEXICAN INDUSTRIAL POLICY AND TARGETING

Introduction

Since World War II, the Mexican Government has sought domestic industrial development through policies to promote import substitution. These policies have emphasized protecting the domestic market from international competition. An average 7 percent annual growth rate, sustained throughout much of this protectionist period, transformed Mexico from a primarily agrarian economy into one with a large domestic manufacturing sector capable of serving the sizable internal market for consumer goods. In the 1970's, this success was augmented by both rapid increases in petroleum revenue and access to foreign loans. During the 1980's, falling prices of oil and subsequent debt repayment difficulties have forced Mexican policymakers to look for a way to increase nonpetroleum exports. ^{1/} The Government's first steps in this direction are aimed at raising the efficiency of domestic producers and the quality of their products to levels adequate to compete in international markets.

Historical Overview

Economic and policy developments, 1940-70

A major shift in the structure of the Mexican economy took place after 1940. The manufacturing sector (growing at an average rate of about 10 percent between 1940 and 1945) outstripped the agricultural sector as the mainstay of the economy. From 1940 to 1960, agricultural production decreased from over 22 percent to near 17 percent of gross national product (GDP) and manufacturing rose from near 17 percent of GDP in 1940 to over 21 percent in 1960 (see table 51).

A number of industries excelled during this period of growth. Much of the chemical industry first developed during the war. Mexico's first fertilizer plant, funded by the official development bank, Nacional Financiera, began production in 1945. Manufacturing industries such as iron and steel, cement, and pulp and paper expanded rapidly. Infrastructure development was lagging behind, however, so the Government increased investment in transport and power facilities.

Structural change was also reflected in the composition of trade. Agricultural exports performed well, but their share declined from almost 47 percent of total exports in 1950 to about 43 percent of total exports in 1965. Manufactured exports grew from about 7 percent of total exports to over 17 percent of total exports during the same period.

^{1/} Petroleum exports represent almost three-quarters of total Mexican exports, therefore export diversification is a Government priority.

Table 51.--Mexico: Gross domestic product, by sectors, 1940, 1950, and 1960

(In billion of pesos)						
	1940		1950		1960	
	Amount	Percent	Amount	Percent	Amount	Percent
	: of total:		: of total:		: of total:	
	: Billion:		: Billion:		: Billion:	
	: pesos		: pesos		: pesos	
Agriculture-----	10.2	22.4	17.1	20.0	25.9	16.6
Manufacturing-----	7.6	16.7	16.4	19.2	33.3	21.4
Mining-----	2.0	4.4	2.0	2.3	2.7	1.7
Petroleum-----	1.1	2.4	1.9	2.2	3.9	2.5
Electricity-----	.3	.6	.5	.6	1.3	.8
Construction-----	2.3	5.1	3.8	4.4	7.7	4.9
Transport-----	1.7	3.7	3.4	4.0	6.2	4.0
Commerce-----	10.0	22.0	20.7	24.2	36.9	23.7
Government-----	2.1	4.6	4.0	4.7	6.2	4.0
All other-----	8.2	18.0	15.5	18.1	31.7	20.3
Total-----	45.5	100.0	85.4	100.0	155.9	100.0

Source: Manual de Estadísticas Básicas quoted in Timothy King, Mexico: Industrialization and Trade Policies Since 1940, Oxford University Press, 1970, p. 17.

Several factors contributed to this transformation. In 1941, tax incentives to promote manufacturing were expanded. In 1943, the Government raised tariff rates on more than 600 items not covered by a reciprocal trade agreement with the United States. The foundation of import licensing, later to become the most important import-restriction tool, was laid under a 1944 decree that authorized government agencies to begin compiling lists of products for possible licensing. ^{1/}

Although import protection and industrial promotion may have contributed to the manufacturing boom, wartime shortages of foreign supplies to satisfy domestic and international demand were a major factor. Hence, when the war ended, renewed competition from imports became a more serious problem, since many of the industries that had expanded to satisfy wartime demand were operating at high costs.

To counter this post-war import competition, the Government implemented new protectionist policies. In 1947, import bans were placed on 120 items considered luxury imports and tariffs were raised again. Since balance-of-payments deficits persisted, the peso was devalued in 1947 and again in 1948. This combination of trade barriers and peso devaluation supported import substitution efforts, particularly in consumer durables where Mexican industry was strongest. By the end of the 1940's, the manufacturing industry, which had slowed from 1945 through 1947, renewed its growth at an annual rate of 6 percent.

^{1/} The licensing system was not set in motion at this time.

The succeeding administration of Ruiz Cortines (1952-58) continued the policy of import substitution under heavy protection. In 1954, import duties were again raised and the import licensing system was extended. Under Cortines, the Government also tried to reduce the side effects of the U.S. recession by devaluing the peso. This move only worsened matters as capital fled, reserves declined, and inflation surfaced. Prices rose in 1955 by 14 percent over their 1954 level, but shortly thereafter resumed more usual levels of around 5 percent. Restrictive monetary measures, taken to fight inflation, may have induced the first signs of diversion of private savings to finance public expenditures.

Under the Lopez Mateos administration (1958-64) continuing economic slowdown contributed to the introduction of stronger techniques for promoting industry. Up to this time, industrial promotion policy consisted of import protection and infrastructure investment rather than direct intervention. New policy tools included domestic content requirements, formal designation of domestically available import substitutes, and sectoral decrees. For example, an automotive sector decree published in 1962 set domestic content levels for the auto industry at 60 percent. ^{1/} A list of products designated as import substitutes was published which implied that producers of the named products would gain easier access to protective measures and economic incentives. This list, representing the Government's first attempt to establish specific industrial priorities, was expanded in 1967.

Several notable trends developed during the 1960's in the areas of trade, public finance, and foreign borrowing that formed a tenuous economic underpinning to industrial growth. In spite of import substitution policies, Mexico ran increasingly high trade deficits. The 1970 trade deficit of \$888 million was more than double the 1960 deficit of \$354 million. In addition, the deficit of the Federal Government increased rapidly, reaching almost 6.1 billion pesos in 1970. Foreign public debt in 1970 amounted to nearly 12.3 billion pesos. The Government's foreign debt 5 years earlier was only 4.8 billion pesos.

Economic and policy developments, 1970 to present

The problems of rising trade deficits, public sector deficits and foreign borrowing persisted into the 1970's, and were joined by inflation. Although the peso was devalued by 60 percent in 1977, trade deficits continued to climb, reaching over \$2.8 billion in 1980. The public sector deficit of about 392 billion pesos in 1981 was almost 3 times larger than the deficit of 1980 and over 10 times greater than the 1974 deficit. External debt reached U.S. \$34 billion in 1979, up from \$3.2 billion in 1970. ^{2/} Double-digit inflation also developed in the 1970's as the economy overheated. Inflation averaged 18 percent during the decade, following an average of 5 percent from 1940 to 1970.

Much of this increased Government spending, heightened with the addition of oil revenue after 1977, was intended to stimulate the slowing rates of

^{1/} These levels of domestic content, not strictly enforced at first, took several years to achieve.

^{2/} Chandra Hardy, "Mexico's Development Strategy for the 1980's," in World Development, vol. 10, No. 6, p. 502.

growth in earlier high-performance sectors such as manufacturing. Table 52 shows that in 1970-81 manufacturing grew at a rate that was only slightly greater than the growth rate for the Mexican GNP as a whole. ^{1/}

Table 52.--Mexico: Gross national product by sector, 1982

Sector	At current prices		At constant prices ^{1/}	
	Value	Percent of total	Percent of increase or (decrease) since--	
			1981	1970
			Percent	Percent
	Million U.S. dollars			
Commerce, restaurants, hotels-----	37,438	22.8	(1.9)	100.3
Manufacturing-----	34,991	21.2	(2.9)	107.5
Medical, educational, government and professional services-----	30,909	18.8	4.4	112.1
Mining, crude oil and gas-----	16,339	9.9	9.2	207.1
Agriculture, livestock, etc-----	12,125	7.4	0.6	46.3
Transportation, warehousing, communications-----	10,570	6.4	(3.8)	221.5
Financial services (net), rent-----	10,552	6.4	2.9	69.4
Construction-----	10,315	6.3	(0.5)	111.9
Electricity-----	1,353	0.8	6.6	184.3
Total-----	164,692	100.0	(0.5)	104.4

^{1/} Based on 1970 prices

Source: Secretaria de Programacion y Presupuesto.

Meanwhile mining--most of which consisted of oil extraction-- tripled, growing twice as fast as the GNP as a whole. By 1982, manufacturing accounted for 21.2 percent and mining (mostly petroleum), for 9.9 percent of the GNP.

The structure of trade changed dramatically as petroleum exports almost tripled in value between 1976 and 1977, and amounted to over 941 billion pesos, or 74 percent of total exports by 1982. The share of manufactured exports steadily decreased from a peak of 52.6 percent of total exports in 1974 to 17.5 percent in 1981. Traditional Mexican exports such as coffee, cotton, and shrimp also decreased steadily in importance.

As long as the world demand for oil was strong and its dollar prices continued to rise, foreign bankers were willing to extend loans. In mid-1981, when the global recession caused the world demand for oil, and thus its price, to decline, Mexico's earnings from oil exports fell. Declining oil prices, coupled with high interest rates on foreign loans, resulted in Mexico's

^{1/} Manufacturing includes the refining of crude oil and the production of derivatives and basic petrochemicals, but it excludes oil extraction.

inability to pay off the loans. Mexico was forced to seek emergency loans from foreign central banks and postpone repayment of debts owed to foreign commercial banks.

The 1982 balance-of-payments crisis.--The effects of over-extended credit came to a head by August 1982 when Mexico faced the greatest economic crisis of its history. When the unavailability of foreign exchange reached critical proportions, creditors granted Mexico a 90-day moratorium on interest and principal of public sector debt until the end of the year. ^{1/} The immediate Government response included the devaluation of the peso, complete exchange controls, across the board import licensing requirements, and the nationalization of the banking system. The Government, forced to seek emergency external borrowing, agreed to an International Monetary Fund (IMF) economic adjustment program to institute structural economic change and bring external debt under control.

A severe austerity program was put into place which required a sharp cutback in public expenditures, including those essential for economic growth and maintenance of employment. Institution of this recessionary stabilization program also entailed severe curtailment of imports. Availability of credit, raw materials, and components were restricted not only by the domestic contraction, but by a virtual cessation of international flows of funds when the foreign banks froze lending and the Government imposed tight foreign-exchange controls. Thus, the industrial sector faced shortages of many essential materials and equipment and the economic activity of all sectors declined.

Recovery from the debt crisis was proceeding, but at the heavy cost of economic contraction. The forced economic retrenchment was reflected in economic performance in 1983. In real terms, the GDP shrank by 4.7 percent. The 1983 drop in GDP and the 0.5 percent drop in 1982 followed 4 years of 8 percent average growth and over 50 years of positive growth rates since the depression of the 1930s.

The reduction in GDP reflected a drop in industrial production as a whole, which decreased by an average of 7.4 percent in 1983. Although industrial production in chemicals, food, and beverage industries remained near 1982 levels, capital goods production saw a 25.1 percent decline in output.

Table 53 shows that the decline for construction was severe, falling by more than 33 percentage points. Production in the mining, manufacturing, and electricity sectors also declined. Nevertheless, production in these sectors declined in progressively smaller percentages each quarter of 1983. Most industrial sectors still have large degrees of excess capacity and the financial conditions of many private sector companies preclude higher investment spending in 1984. Slight signs of recovery were evident in the first quarter of 1984. Manufacturing production grew at 0.6 percent in January, 2.9 in February, and 5.0 percent in March.

^{1/} At the beginning of 1982. Mexico's total foreign debt (public and private) was more than \$70 billion. At the end of 1982, this figure had reached more than \$80 billion.

Table 53.--Mexico: Indexes of the volume of industrial production, by sectors, 1979-83

(1970=100)						
Sector	1979	1980	1981	1982	1983	1/
General Index-----	187.4	205.7	223.9	219.5	201.4	
Manufacturing-----	184.4	198.8	213.5	206.5	189.8	
Food, beverages, and tobacco-----	156.3	166.6	175.1	182.3	176.9	
Textiles and apparel-----	163.9	168.6	179.9	169.6	161.0	
Wood industries-----	169.7	180.0	187.0	193.6	199.2	
Paper, printing, and editorial-----	173.4	192.2	199.2	203.7	195.4	
Chemicals, rubber, and plastics-----	221.1	242.7	262.3	267.5	267.5	
Nonmetallic minerals-----	178.5	193.4	208.8	194.7	168.0	
Basic metals-----	195.4	202.1	209.2	190.8	180.1	
Metal products and machinery-----	217.4	242.8	270.6	232.9	169.7	
Mining-----	200.1	244.8	282.3	308.3	299.5	
Construction-----	184.7	208.2	232.1	220.3	187.0	
Electrical-----	235.3	251.7	272.4	288.3	293.5	
Petroleum-----	250.4	310.5	362.3	395.0	396.1	

1/ Preliminary figures

Source: Banco de Mexico

A sharp reduction of imports was one of the most successfully implemented steps easing Mexico out of its 1982 balance-of-payments crisis. The trade account surplus rose to \$13.7 billion in 1983, \$6.8 billion above the 1982 level. This trade surplus gave Mexico its first current account surplus in 30 years. Continuing trade surpluses are called for under the economic adjustment program in order to meet debt-servicing obligations.

Despite the export incentive offered by peso devaluation, the favorable trade and current account balances in 1983 were more a result of import reductions than rising exports. Imports in 1983 fell to \$7.7 billion, down from \$14.4 billion in 1982. Accordingly, the current account moved from a deficit of \$4.9 billion to a surplus of \$5.5 billion, as a result of this 47-percent decline in imports. Though the strict emergency import curbs of 1982 were relaxed later in 1983, economic contraction kept import demand low throughout the year. Plans are now in place to ease the emergency import restrictions (both licensing and tariffs) as a long-term step to force domestic manufacturers to increase efficiency and meet world standards in price and quality.

Mexico's management of external debt following the crisis proceeded smoothly. In 1983, Mexico met the stringent IMF conditions for the \$3.9 billion credit facility negotiated in 1982, by making payments on schedule. By late October 1983, \$23 billion of public sector foreign debt had been rescheduled. The restructuring pact allowed Mexico a grace period on payments of principal until 1987 and the infusion of \$5 billion in new commercial loan

into the economy to facilitate interest repayment. Private sector debt, of more than \$11 billion, was also rescheduled through a facility of the Bank of Mexico. 1/

Current economic program.--Mexico's current President, de la Madrid, inherited the responsibility of resolving the problems of inflation (at 100 percent in 1982), capital flight, falling output, and rising unemployment when he took office 4 months after the August 1982 debt crisis. At this time, the country's foreign-exchange reserves were still not sufficient to meet short-term external liabilities. President de la Madrid was charged with implementing the austerity measures upon which the IMF Extended Fund Facility Program was based. The core objectives of the IMF program included (1) sharp annual reductions in the size of the public sector deficit, (2) annual reductions in the inflation rate, (3) drastic cutbacks of external borrowing, and 4) a determined buildup in foreign-exchange reserves.

Economic plans based on these objectives projected a reduction in public sector spending of 15 percent in 1983, a reduction in the public deficit's share of GNP to 8.5 percent from its level of 17.6 percent in 1982, a minimum \$2 billion buildup in foreign-exchange reserves, and a cap of \$5 billion on net external borrowing. Reduction of inflation was one of the most difficult goals to meet. Mexican Government projections set inflation at 40 percent for 1984, a rate which is expected to be exceeded by 15 to 20 percentage points. Though the 1983 public deficit, at 8.7 percent, slightly exceeded its target, other projections were largely met.

Maintaining a positive merchandise trade balance, principally through cutting back imports but also through raising exports, was also a priority set by the de la Madrid administration. Imports have been cutback, but export promotion, a long-neglected policy of the Mexican Government, would require more intense effort for the new administration. According to a 1979 World Bank study, incentives to manufactured exports, when counterbalanced with various disincentives, including the unfavorable effect of the overvalued peso, resulted in a negative net rate of export incentive of 10 percent in 1975. 2/ Although the exchange rate has now been adjusted, other entrenched administrative factors discouraging exports remain. In a recent report, the nation's industrial development bank, Nacional Financiera, described the short-term outlook for raising exports as limited for the many firms inexperienced at exporting. The report observed that manufacturers will need to develop distribution and marketing channels as well as to improve design and quality to compete in international markets. 3/

In addition to economic policy adjustments made in response to the debt crisis, the de la Madrid administration reassessed many economic policy mechanisms and institutions in order to bring the diffused and redundant administrative system under control. Commerce institutions and programs were

1/ This facility, a governmental trust fund called FICORCA, is described later in more detail in the section on the financial system.

2/ Mexico--Manufacturing Sector: Situation, Prospects and Policies, The World Bank, 1979, p.20. Disincentives other than peso overvaluation included in the total export disincentive figure included higher cost and lower quality inputs, sales taxes on inputs, and export taxes.

3/ Nacional Financiera, The Mexican Economy, April 1984

consolidated. Major tax incentives were suspended until a full reevaluation could take place. Formal national planning procedures were strengthened as a means of coordinating the many independent economic programs created over the years without regard to already existing measures.

Industrial policy

Implementation of Mexican industrial policy is characterized by the setting of broad economic goals and objectives through national planning, setting of sectorially specific priorities under both national plan prescriptions and separate sectoral decrees, and by directing the massive public sector of the economy. These important elements of industrial policy are described below.

National Planning.--Until 1979, Mexico's Government did not formally employ economic planning. Although a General Planning Law had been in effect since 1930, the "plans" of Government institutions were unpublished internal documents with little practical effect. During the years of the Alliance for Progress, the requirement that Latin American recipients of U.S. aid produce an economic plan probably inspired the 1962 Plan of Immediate Action in which private investment was considered in addition to public investment. In terms of sectoral emphasis, the 1962 plan assessed public and private investment in the automotive, steel, and chemical industry sectors. Since it was not published, it could not serve the private sector as a guide to Government policy.

In 1979 national planning was formalized. The Government published the National Industrial and Development Plan, 1979-1984 (NIDP), which reiterated many of Mexico's longstanding economic priorities and goals. The de la Madrid Government replaced this plan in 1983, issuing a new 5-year NIDP that reaffirmed the economic adjustment program. The plan identified control of inflation as its highest priority in the short term and renewed economic growth and job creation in the longer term. The ministries of finance and commerce have also published plans charting the policy goals in their respective areas of responsibility. Government officials describe the national plans as only indicative for the private sector but mandatory for the public sector.

Priority industries.--Two broad industrial activity classifications received high priority in both the 1979 and the current NIDP. Top priority by branch of economic activity is placed on the agroindustrial sector and capital goods manufacturing. The second ranking activities include certain durable and nondurable consumer goods and intermediate goods. On the whole, an emphasis on agroindustry and food production stands out most clearly, followed by priority on strengthening infrastructure in the electricity, construction, and transport sectors.

In terms of specific industries, priorities include petroleum, petrochemicals, mining, chemicals, electronics, cement, steel, pharmaceuticals and a variety of other machinery and equipment and consumer goods. These are industries in which the Government would like to see targeting techniques effectively applied. Cement, steel, and pharmaceuticals are the only products singled out as strategic materials. Priority classification is granted to such a comprehensive collection of industries that they represent about 60 percent of the gross value of industrial production.

Publication of lists designating priority industries began in the early 1960's, but the most comprehensive list was published in the official gazette in 1979 to accord with the NIDP. ^{1/} The status of inclusion on "priority lists" implies that protective measures and economic incentives are more easily obtained for these activities, though not necessarily to the exclusion of other industrial activities.

The use of Government decrees, as a means of achieving both promotion and regulation of specific priority industries, is increasing. Automotive decrees have existed since 1962. More recent decrees on the computer and pharmaceuticals industries are expected to be joined by one on the food processing industry and a number of other decrees or "sectoral plans" for specific industries in the future.

The role of the public sector.---In Mexico's mixed economy the Federal Government and its corporations figure prominently in national investment, foreign trade, foreign debt, and domestic commerce. The magnitude of the public sector is great. About 550 Government enterprises, ranging in size from Pemex, the Government oil monopoly, to small agricultural cooperatives, sell products and services. By law, petroleum, petrochemicals, mining, electricity, nuclear energy, railroads, and telecommunications industries are reserved to the Government. Public sector investment reached about 1 trillion pesos, or more than 10 percent of GDP, in 1982. Public investment in 1983 represented over 45 percent of total investment. In trade, the public sector accounted for 60 percent of total imports and 84 percent of total Mexican exports in 1983 and its external borrowing reached about \$5 billion. Direct subsidies to public sector enterprises amounted to over 630 billion pesos, nearly one-third of the total income of all controlled enterprises other than Pemex.

Home Market Protection

Under the policy of import substitution, foreign access to Mexico's market has traditionally been limited in order to promote domestic industrial development. Since 1982, Mexico's need to generate export revenue to pay foreign debt has lead to a gradual opening up of the domestic market so that Mexican producers are forced to meet international competition. Recent directives of the Secretariat of Commerce and Industrial Development have presented a package of trade measures designed to achieve this goal. Import restrictions such as licenses, quotas, tariffs, and currency allocation are being reduced from 1982 levels. The impact of the public sector on the balance of payments is being moderated. Also, foreign investment is being offered more frequent exemptions from the stringent foreign investment regulations.

In 1983, Mexico's trade balance registered a surplus owing to sharp declines in imports to a level of \$7.7 billion and a slight increase in exports to \$21.4 billion. Imports fell in all customs categories except food, but declined particularly in the area of manufactures. Declining prices of oil pushed the value of petroleum exports down despite the higher volumes sold in 1983. Though exports of manufactured products rose they still represented only about 25 percent of the value of total exports.

^{1/} Table 10 in the section on tax policy presents the main elements of the 1979 list and subsequent additions.

The United States accounted for two-thirds of Mexico's 1983 trade surplus; 59 percent of total Mexican exports and 63 percent of overall imports. 1/ Mexico imported \$8.8 billion from the United States in 1983 mostly in machinery and transportation equipment, chemicals, and food and live animals. Exports to the United States reached \$16.6 billion in 1983. Mineral fuels continued to account for more than one-half of the total. Other leading Mexican exports to the United States include machinery and transportation equipment, and traditional export items such as shellfish, gold and silver bullion, and coffee.

Special trade programs covered almost 27 percent of total Mexican exports to the United States in 1983. Much of the machinery and equipment items entered the United States under TSUS items 806.30 and 807.00 for import of products with U.S.-origin components and processing, with duty assessed only on the value added in Mexico. Over 4 percent of Mexico's exports to the United States entered duty free under the U.S. Generalized System of Preferences program. Mexico's exports to the United States are also granted most-favored-nation treatment. 2/

During 1984, the Government set the proposed import level about \$5 billion higher than that for 1983. Priority has been placed on increasing imports of raw materials for essential industries such as chemicals, petrochemicals, pharmaceuticals, replacement parts for industrial machinery and equipment, machine tools, and measuring and controlling instruments.

Trade restraints

Import licensing.--The Mexican Government uses import licensing more than any other mechanism to achieve protection of the domestic market. As an emergency economic measure at the end of 1982, the system was expanded to include virtually all imports. These controls were progressively eased throughout 1983 and 1984.

After February 1983, exceptions from import licensing were granted on 350 items, representing mostly spare parts to keep plants and factories operating. In December 1983, over 1,700 more customs categories, representing 5 percent of total annual imports, were freed from licensing requirements. 3/ These included raw materials for the pharmaceutical, petrochemical, paper, metal-mechanic, and machinery industries, materials and machinery for food and beverage production, and machinery for the textile industry. 4/ These categories were exempted from licensing because they were not produced in

1/ Mexico's second and third leading trade partners are Japan and Spain. In 1983, Mexico reported a trade surplus with both countries.

2/ Although Mexico is neither a member of the General Agreement of Tariffs and Trade nor party to an equivalent bilateral trade agreement with the United States, the United States grants most-favored-nation treatment to Mexico under Article 351 of the Tariff Act of 1930. Mexico reciprocates on customs treatment of imports from the United States.

3/ Particularly for amounts under US\$3,000. Importers have to file their permit request with the Ministry of Commerce and Industrial Development (Secofin), which makes it available in 10 working days (Business Latin America, Jan. 18, 1984, pp. 19-20.)

4/ Business Latin America, Feb. 15, 1984.

Mexico and were considered necessary to sustain productive capacity and public health. Conditional licensing exemptions were also granted in December 1983 for small purchases in 187 customs categories consisting of machinery and equipment for emergency industrial use. Imports under this provision were limited to \$3,000 per transaction and a \$6,000 total per month per company. Full licensing requirements remain in effect on 6,329 categories of the Tariff of General Import Taxes.

Import quotas.--Import quotas, or target import levels, are allocated to products not produced in Mexico or for which Mexican production is insufficient. When granting import licenses for products under quotas the Government gives preference to imports purchased with foreign currency earned through exports or paid for by international financing. Quotas cover imports amounting to a value of about \$1.5 million.

Controlled foreign currency market.--At the end of 1982, Mexico established foreign-exchange controls and a two-tier exchange rate system. 1/ Under this system certain imported products are paid for with currency exchanged at a favorable, controlled-market rate and other products are paid for with currency bought at higher free-market rates. 2/ Exchange regulations are implemented through the import permit system. If an import permit does not grant the right to controlled-rate foreign currency, currency exchanged at free-market rates must be used.

These controls, intended to be temporary, are being relaxed somewhat. In December 1983, 390 customs categories, including products destined for the pharmaceutical, editorial, and chemical industries were added to the list of imports which can be paid for at controlled currency rates. All imports paid for with foreign currency earned by exports, either direct or transferred, also were given this advantage. Under these modifications, nearly 90 percent of imports now can be imported using the controlled rates.

Tariffs.--In spite of high tariffs on many products, the effective level of tariff protection in Mexico is often insufficient to protect domestic industry. Tariffs, though sometimes adequate for protective purposes, serve to raise revenue. In fact, combined import and export duties accounted for about 30 percent of Federal tax revenue in 1983. Table 54 illustrates levels of protection and price levels vis-a-vis world prices for certain products.

1/ At the end of 1983, the controlled rate stood at 143 pesos to the dollar, whereas the free-market rate had reached just over 160 pesos to the dollar. Because the Government has steadily devalued the controlled peso (by about 13 centavos daily), the two rates have moved somewhat closer together.

2/ The U.S. Department of Commerce addressed the impact on exporters of the dual exchange rates in a 1983 countervailing duty order on iron metal construction castings from Mexico. It determined that since most imports may be purchased with currency converted at the controlled rates, but some incur the free rate, the exporter did not benefit from the two-tier system but could even be disadvantaged when imported inputs required free-market currency.

Table 54.--Mexico: Levels of tariff protection and nominal and effective rates of protection for selected industrial manufactures in 1983

Sector	Tariff level <u>1/</u>		Level of protection <u>2/</u>	
	Average <u>3/</u>	Weighted <u>4/</u>	Nominal <u>5/</u>	Effective <u>6/</u>
Paper and cardboard-----:	31.6 :	7.1 :	-13 :	-6
Printing and editorial-----:	33.9 :	2.8 :	-40 :	-56
Petroleum and derivatives-----:	9.6 :	0.9 :	-43 :	-452
Basic petrochemicals-----:	12.3 :	2.1 :	-50 :	-22
Basic chemicals-----:	22.2 :	9.0 :	-2 :	73
Manure and fertilizers-----:	3.6 :	0.2 :	-56 :	-88
Synthetic resins and artificial fibers. :	23.0 :	12.8 :	25 :	259
Medicinal products-----:	14.7 :	8.5 :	-40 :	-61
Soap detergents-----:	66.3 :	99.9 :	-20 :	-22
Other industrial chemicals-----:	17.0 :	9.7 :	2 :	13
Rubber products-----:	28.8 :	7.9 :	28 :	55
Plastic articles-----:	35.9 :	22.8 :	34 :	196
Glass-----:	37.4 :	28.6 :	-32 :	-40
Cement-----:	8.3 :	5.0 :	-28 :	7
Other nonmetallic mineral products. :	38.1 :	28.5 :	-23 :	-20
Basic iron and steel industries. :	12.8 :	14.7 :	-26 :	-28
Nonferrous metal industries-----:	18.3 :	5.5 :	11 :	53
Metal furniture-----:	45.9 :	72.6 :	-22 :	-35
Structural metal products-----:	30.6 :	44.1 :	-12 :	-9
Other metal products-----:	37.4 :	23.5 :	-17 :	-23
Nonelectric machinery-----:	16.8 :	10.9 :	3 :	12
Electric machinery-----:	20.3 :	14.7 :	1 :	5
Domestic appliances-----:	67.9 :	50.2 :	-9 :	-12
Electronic equipment-----:	24.3 :	18.3 :	38 :	125
Other electronic equipment-----:	21.2 :	13.9 :	10 :	27
Automotive vehicles-----:	44.3 :	59.5 :	4 :	87
Autotive frames and auto-----:	28.6 :	8.7 :	-29 :	-39
Other transport equipment-----:	27.1 :	7.6 :	-10 :	-14
Other manufactures-----:	29.1 :	15.1 :	-1 :	9

1/ Based on imports from January through August 1983.

2/ Calculated through September 1983

3/ Average tariff is the sum of the tariff rates divided by the number of fractions.

4/ Average tariff weighted by imports is the estimated amount of duties collected divided into value imported by sector.

5/ The percentage difference between internal and external product price.

6/ The protection of a product according to inputs in terms of value added.

Source: National Plan for Industrial Development and Foreign Commerce 1984-88.

In spite of tariff protection, price controls and other measures tend to push the prices of many protected products below world levels. Other products, such as plastics, artificial fibers, and electronic equipment are substantially above world market prices.

The Government is considering various measures to implement a policy it calls "rationalization of effective tariff protection." In July 1982, a new Customs Tariff Law replaced the previous Customs Tariff Code and the Law for Customs Tariff Valuation of Imported Merchandise. 1/ The new law amends certain rules to conform more closely to international practices for determining the dutiable value of goods. Furthermore, the law directs the reevaluation of other measures. Duty levels are to be adjusted, taking into account protection afforded by other instruments of economic policy. Rate schedules are to be simplified by establishing duties by production branch instead of by multiple subclassifications as has been the practice. It also restricts the exercise of tax credits for the cost of import tariffs to circumstances in which national industry is temporarily unable to supply basic consumables and international prices are higher than domestic prices.

Industrial priorities are reflected in selective tariff exemptions included in a new tariff schedule published in March 1984. Agricultural machinery, gas, wheat, aluminum, and tin are duty free. Generally, duties on machinery and raw materials vary from 2 percent to 15 percent ad valorem. In addition, automotive producers, to boost their input, can receive up to 100 percent tariff exemption from ad valorem tariffs on a range of products under certain conditions. 2/ Exemptions are applicable to machinery and equipment for new investments or expansion, provided that the items cannot be purchased locally or that they are used to manufacture new products that increase local content or boost exports.

Other priority industries offered tariff exemptions include producers of basic foodstuffs, consumer goods for low-income households, and various intermediate manufacturing goods (such as fibers derived from petrochemicals, synthetic rubber, plastic resins, and specific chemicals and capital goods). Producers of such goods can import raw materials, components, and spare parts duty free, or at reduced rates if orders cannot be filled locally. 3/

Export controls.--To the small extent that Mexico exercises control over exports, the aim is to ensure that local requirements are met and that raw materials are available to domestic manufacturers. Generally, Government policy has long encouraged exports of finished goods. Nevertheless, policies aimed at satisfying the Mexican market have historically taken higher priority. Since 1982, the rigors of foreign debt repayment have required greater focus on finding ways to raise exports.

One aspect of the current export promotion thrust is the relaxation of export controls and the elimination of certain export taxes. Export permits for 2,651 customs categories under quantitative controls were exempted from prior-permission requirements in December 1983. These categories constitute 88 percent of total exports. Export licensing remains in effect for 382 categories.

1/ The former Customs Tariff Code and the Tariff Law had been in effect since 1951 and 1978, respectively.

2/ Business Latin America, Apr. 11, 1984, p. 119.

3/ Ibid.

About 92 percent of total 1983 exports, or 2,820 categories, are exempt from export duties. Export taxes were eliminated on 25 product groups and reduced on another 21 categories in 1983. The remaining duties are to be applied only to prevent national shortages, to encourage high value-added exports, and to discourage circumvention of controlled-market foreign currency rules.

The Mexican Institute of Foreign Trade (IMCE)

IMCE coordinates Government efforts to stimulate foreign trade. Some of the functions of IMCE include organizing and directing trade fairs abroad, promoting visits of foreign trade missions to Mexico, determining Mexican products with potential for sales abroad, and providing technical assistance to exporters.

Registration with IMCE has certain advantages for firms that are importing to produce export products. For example, companies wholly engaged in export and registered with IMCE may obtain open-ended import permits for items used in their productive processes.

Protection afforded by the public sector

The Mexican Government directs activities of the public sector in a manner consistent with policies to protect the home market. Considering the dominant position of the public sector in the Mexican economy, Government transactions influence import substitution efforts as well as the balance of payments. Public enterprises not only purchase domestic products that substitute for imports, they also manufacture products that can serve as import substitutes and are engaged directly in exporting and importing. Furthermore, public investment directs resources toward priority sectors of the economy.

The public sector outstrips the private sector in total levels of both imports and exports. Of an estimated \$13.5 billion that will be imported in 1984, about \$6.2 billion is expected to be public sector purchases. ^{1/} Exports of the public sector (mostly of petroleum) represented 76.1 percent of total exports in the first 2 months of 1984, down from a level of 83.5 percent of exports in the corresponding months of 1982 (see table 55).

^{1/} Four agencies account for over half of Government imports. These are Pemex, the Mexican petroleum company; the national railways; the Federal Electricity Commission; and the National Popular Supply Co., which buys basic necessary foodstuffs in bulk. Other leading Government importers purchase newsprint, steel manufacturing equipment, and automotive parts (for Diesel Nacional the only remaining Government-owned automotive plant) as well as various items for infrastructural, agricultural and military purposes.

Table 55.--Mexico: Cumulative trade balance, January-February of 1982-84

(millions of U.S. dollars)						
Item	1982		1983		1984	
	Value	Percent of total	Value	Percent of total	Value	Percent of total
	Million:		Million:		Million:	
	U.S.		U.S.		U.S.	
	dollars:		dollars:		dollars:	
Exports-----	2943.7	100	3336.2	100	4056.4	100
Public sector-----	2333.4	79	2785.9	84	3085.9	76
Private sector-----	610.3	21	550.3	16	970.5	24
Imports-----	3274.1	100	840.8	100	1329.0	100
Public sector-----	1075.0	33	501.8	60	736.3	55
Private sector-----	2199.2	67	339.0	40	592.7	45

Source: Nacional Financiera, The Mexican Economy, June 1984

Government procurement.--Throughout several Mexican Administrations, Government entities have been directed to purchase domestic products whenever possible. According to this policy, Government entities should import only when similar items are not available in Mexico, when international lending requires it, or when a specified price differential is exceeded. However, a 1979 World Bank study noted that Government entities had not aggressively sought out domestic supplies. 1/ Now, with stepped-up efforts to avoid imports, these entities are expected to observe domestic procurement requirements more strictly. 2/ With the proportion of public sector expenditures to GNP at more than 45 percent in 1983, the potential impact of this policy on efforts for home-market protection is great.

In order to import, all public sector entities must obtain import licenses from the Secretariat of Commerce and Industrial Development (Secofin). In recent practice, however, public concerns reportedly gained import approval routinely. A Government directive of December 1983 strengthened the rules that no import permits would be granted to the public sector for goods produced in Mexico that can be supplied with adequate price, quality, and punctuality. In addition, to obtain better prices and financing terms, consolidation of public sector import purchases is planned.

1/ Mexico--Manufacturing Sector: Situation Prospects and Policies, The World Bank, 1979, p. 33, describes the reluctance of some public enterprises to use domestically produced equipment and states that tariff concessions available for government purchases had weakened their contribution to import substitution.

2/ According to Business Latin America, of March 14, 1984, a related program of Pemex is specifically aimed at import substitution in government procurement. The state-owned oil monopoly has laid out a new program with the ambitious goal of reducing foreign purchases by 15 percent in 1984. Pemex has identified a wide range of services and products that it will henceforth purchase from Mexican companies.

Public sector production.--Government-owned enterprises have been set up in industries whose products are considered vital to import substitution. The most outstanding example is Government-ownership in the petroleum and primary petrochemical industries. Since the discovery of major Mexican oil reserves in 1977, the petrochemical sector has been considered the most promising area for import substitution. Pemex, the Government oil company, is now believed to have passed the stage for easy import substitution, and therefore plans to boost production of higher valued petrochemical products to replace imports. ^{1/}

Public sector investment. ^{2/}--Public sector investment is used to direct resources to priority industrial sectors. The structure of public sector investment between 1977 and 1982 emphasized certain industries (table 56).

Table 56.--Mexico: Public sector investment, 1977-82

Item	1979	1980	1981	1982	Total 1979-82
Oil and petrochemicals					
billion pesos--	91	126	230	285	732
Power-----do-----	39	63	86	118	306
Steel-----do-----	3	8	13	29	53
Transport-----do-----	36	53	104	144	337
Telecommunications-----do-----	10	14	20	31	75
Fertilizer-----do-----	3	5	10	8	26
Agricultural and Rural development-----do-----	47	77	105	183	412
Total, above-----do-----	228	346	567	798	1,939
Total, public sector-----	294	416	779	1,006	2,495
Total public sector (1980 prices)-----do-----	379	416	613	491	
GDP (1980 prices)-----do-----	3,948	4,276	4,616	4,593	
Share of public sector in GDP-----percent-----	9.59	9.73	13.27	10.68	
GDP deflator-----do-----	77.70	100.00	127.25	205.02	

Source: Ministry of Finance and Public Credit (SHCP), and Ministry of Programming and Budgeting (SPP). Includes World bank estimates.

Almost 30 percent of funds allocated for the public sector went to Pemex for oil and gas exploration and refinement and the production of petrochemicals. Over 12 percent of the funds went into electric power generation. Other industries benefiting from public investment funds included steel and fertilizer production. Pemex, the Federal Electricity Commission, and the Government-owned steel mills and telephone company continue to invest in expansion; Pemex, in order to service foreign debt, and the others, to keep up with rising internal demand.

^{1/} EIU, Quarterly Economic Review of Mexico, No. 2, 1984, p. 14

^{2/} Public sector investment includes investment into operations of the Federal Government, and into independent and semiindependent enterprises controlled by regulatory bodies.

Public sector investment, which had surged following the oil boom, fell off during the 1982 debt crisis and then plummeted after enactment of the stabilization program in 1983. In contrast to the austere 1983 budget, public sector investment in 1984 is scheduled to increase moderately to stem unemployment. Sectors singled out for increased investment are transportation, communications, education, and rural development.

Foreign direct investment

In spite of increasingly strict Government regulation, the rate of growth of foreign investment in Mexico slowed only after 1981. Although foreign investment represents only 4 to 5 percent of total fixed investment in Mexico, it plays a major role in some key industries such as computers, automobiles, and pharmaceuticals.

Accumulated foreign direct investment totaled \$8.4 billion in 1980. The United States' share in this amount was 69 percent, or \$5.8 billion, as shown in table 57.

Table 57.--Mexico: Origin of foreign direct investment, 1980

Country	Amount	Percent of	Percentage change,
	Million	total	1980 over 1979
	dollars		
United States-----	5,836.6	69.0	22.67
Federal Republic of Germany--	676.7	8.0	33.76
Japan-----	499.1	5.9	32.73
Switzerland-----	473.7	5.6	30.74
United Kingdom-----	253.7	3.0	23.74
Spain-----	203.0	2.4	65.04
Sweden-----	126.9	1.5	9.39
Canada-----	126.9	1.5	15.99
France-----	101.5	1.2	23.78
Holland/Belguim-----	93.0	1.1	4.61
Italy-----	25.4	0.3	-53.67
All other-----	42.3	0.5	-22.67
Total-----	8,458.8	100.0	

Source: Commission for Foreign Investment and Technology Transfer.

Foreign investment laws and regulations.--Foreign investment policy is implemented by three laws and their corresponding regulations. The Law to Promote Mexican Investment and Regulate Foreign Investment and the Technology Transfer Law were created in 1973. In 1976, the Law on Inventions and Trademarks was passed. In addition, sectoral degrees regulating specific industries (the automotive and computer industry decrees are described later) contain investment regulations.

The primary method of regulating foreign investment under Mexican law is to set stringent conditions for authorizing the extent of foreign participation in a company. Foreign majority ownership may be granted, even

when normally restricted by law, at the discretion of the National Commission on Foreign Investment. Standards applied to permitting foreign investment include consideration of the potential for: (1) introduction of technologies, (2) employment generation, (3) increasing exports, and (4) industrial diversification. If a proposed investment ranks high enough by these criteria majority foreign ownership may be authorized.

Another way the Government regulates foreign investment is to designate foreign participation in a company according to its industrial activity. In most industries 49 percent foreign ownership is usually approved so long as foreign investors do not control management. ^{1/} However, in some industrial activities foreign investment is more highly restricted or prohibited outright. These activities and the relevant percent of foreign ownership allowed include: mining, 34 percent in national reserve minerals, but 49 percent in others; secondary petrochemicals, 40 percent; automobile parts, 40 percent. Activities exclusively reserved for the Government include: Petroleum and hydrocarbons, basic petrochemicals, nuclear energy and radioactive minerals, electricity, railroads, telegraphic and radio communications, and banking. Complete Mexican ownership is required in the following activities: radio and television, automotive transportation, airways and national maritime transportation, forestry, gas distribution, land and waters, and certain activities under separate regulations including insurance, bonding, and investment companies. ^{2/}

The effect of Government policy is evident on the pattern of foreign direct investment shown in table 58. For example, majority foreign investment in extractive industries are only 1 percent of all majority foreign-owned firms. In manufacturing industries, where foreign investment is less restricted, foreign investment is more widespread representing 52 percent of all firms with foreign participation.

Table 58.--Mexico: Distribution of accumulated foreign investment by share of participation and by sectors, 1980

Sectors	Foreign Participation				Number of enterprises	Percent of total enterprises
	0 to 49.0 percent		49.0 to 100.0 percent			
	Number	Share	Number	Share		
		Percent		Percent		
Agriculture-----	9	.4	20	.7	29	.5
Extraction-----	232	9.1	28	1.0	260	4.8
Manufacturing---	1,284	50.2	1,536	53.5	2,820	52.0
Commerce-----	472	18.4	741	25.8	1,213	22.3
Services-----	563	22.0	546	19.0	1,109	20.4
Total-----	2,560	100.0	2,871	100.0	5,431	100.0

Source: Commission for Foreign Investment and Technology Transfer.

^{1/} A company with 51 percent Mexican ownership is considered a Mexican company for almost all purposes including tax and other incentives.

^{2/} Existing regulations allow foreigners acting as individuals, but not as groups, to own shares in insurance, bonding, and investment companies.

The de la Madrid administration has indicated a willingness to be more lenient in granting permission for foreign majority ownership. Such permission was rarely granted in previous administrations. New investment guidelines issued recently directed the easing of foreign investment limits in heavy machinery, electronic equipment, transportation equipment, chemicals, high-technology goods, and the hotel industry. These industries were chosen because they require high investment per employee or have good export potential.

No special investment incentives are used to attract foreign investors. Domestic investment incentives are not generally available for majority foreign-owned companies although any company with 49 percent or less foreign participation can benefit from most industrial incentive programs on an equal basis with 100-percent Mexican-owned firms. Some notable exceptions to these restriction exist. For example, foreign companies involved in tourism can receive tourism-related government incentives. Also, all foreign companies can use Government export sales credits (though not pre-export production loans) offered by the national foreign trade bank.

The National Commission of Foreign Investment.---This commission is charged with regulating foreign investment not already specifically regulated under Mexican laws. For example, it approves foreign investment in new companies, new investment in existing companies, and regulates the amount of participation of previously existing foreign investment when a company expands into new activities or product lines. In particular, the commission regulates the transfer of technology through approval of contracts governing royalties, patents, trademarks, and know-how. It also determines the industries in which foreign investment will be preferred and helps direct foreign participation to priority locations.

In-bond industries.---Exemptions to most regular foreign investment restrictions are applied to Mexico's in-bond processing industries, which are the second leading export sector after petroleum. Government policy allows 100-percent foreign ownership in such companies, called maquiladoras. Originally, the program was limited to border areas but permits are now being granted for in-bond industries in other priority development areas of Mexico. All in-bond operations are incorporated in Mexico. Although the majority of these operations are at least 51-percent Mexican owned, 100-percent foreign ownership is common.

The industry is a unique and important form of U.S. investment in Mexican manufacturing. Many U.S. companies have established twin plants or complementary facilities under the program. In-bond products enter the United States under special provisions of the items 806.30-807.00 import categories. The program provides a nearby source of low-wage labor to U.S. producers and provides Mexico with employment, training, technology, and a significant amount of foreign-exchange earnings.

In order to qualify for the benefits and exemptions allowed for Maquiladoras, companies must meet a variety of conditions. In-bond companies may ship capital equipment, materials, and work in progress free of duty to Mexico where further processing takes place. The items processed or assembled in the in-bond plants are subsequently returned to the United States, or

exported to third countries, again without payment of export duties. ^{1/} Though in-bond plants were at first authorized to produce only for export, under an order of August 15, 1983, they now may sell up to 20 percent of production for certain items in the Mexican market. Greater percentages may be authorized, at the discretion of the Government, so long as the company continues to produce primarily for export.

Selling in-bond products on the home market requires authorization by the department of commerce and industry (Secofin). Secofin allows domestic selling only if Mexican production of a similar item does not exist or if Mexican production is insufficient to meet demand. Moreover, domestic sales of in-bond firms may not conflict with other investment or development goals of the country and must meet local content requirements where they exist.

In-bond plants have operated principally in industries making textiles, electronics and electrical machinery, and auto parts. Ceramics and toys are also common products of in-bond plants.

Tax Policy

Tax structure

Major taxes in Mexico are on income taxes, value-added taxes, import and export duties as well as Social Security and property taxes. Other special Federal taxes are those applied to the mining industry and excise taxes levied on such items as gasoline and telephone service. Table 59 shows that income taxes as a share of Federal revenue have decreased. Income taxes accounted for about 31 percent of total Federal revenue in 1982 and only 21 percent in 1983, when revenue from government-owned enterprises is excluded. This share is considered low by most standards, but is compensated by import and export taxes (particularly on export taxes on crude oil), which furnished more than 25 percent of 1982 revenue and over 30 percent in 1983.

Table 59.--Mexico: Federal Government revenue, by types of sources, 1980-83

(In percent)				
Source	1980	1981	1982 ^{1/}	1983 ^{2/}
Income Tax-----	34.3	32.0	31.8	21.1
Tax on industry, production, and commerce.	14.0	13.0	12.0	12.1
Import and export taxes-----	31.7	34.1	25.7	30.7
Value-added and turnover tax ^{3/} -----	13.8	16.4	19.3	27.1
Other taxes-----	3.0	1.4	5.0	4.0
Nontax revenue-----	-	-	.5	.3
Total-----	100.0	100.0	100.0	100.0

^{1/} Preliminary.

^{2/} Estimated.

^{3/} In January 1980 the turnover tax was replaced by the value-added tax.

Source: Sectretariat of Programming and Budget

^{1/} In effect, the in-bond plants are not considered part of Mexican customs territory and shipments from these plants are not included in Mexican foreign-trade statistics.

Tax reforms.--The need to decrease the Federal deficit has spurred modification of tax measures to raise public sector revenue. These measures include: (1) adding a surtax of 10 percent on the rate of income tax, (2) raising the basic rate of value-added tax from 10 percent to 15 percent, and (3) raising the value-added tax on processed foods and medicines to 6 percent. In addition, some tax incentives for both exports and investment have been reduced or eliminated.

Incentives.--Tax incentive measures in Mexico are aimed at promoting investment in industries that provide priority capital and consumer goods, generate employment, and locate in areas key to regional development plans. Incentives to encourage manufactured exports and import substitution are used to improve the country's balance-of-payments position. Table 61 lists industries granted priority status for regional and other development tax credits. 1/ Limited Government resources tend to support directing incentives only to companies in priority areas or producing priority goods. Nonetheless, companies in nonpriority activities often continue to receive incentives due to the administrative discretion to consider other factors such as employment potential, technological advancement, and contribution to exportation or import substitution.

Several forms of tax incentives are employed to achieve the aims outlined above. Two major programs, in effect since the seventies, are Cedi's (Certificado de Devolucion de Impuestos) and Ceprofi's (Certificados de Promocion Fiscal). The granting of Cedi's has been temporarily suspended, but Ceprofi's remain in effect. The structure of depreciation rates and accelerated depreciation rates can also function as incentives. Value-added taxes apply to most transactions but are set at a zero rate to benefit many agricultural and agroindustry products and services.

CEDI's

Cedi's were introduced in 1971 as nontransferable tax rebate certificates specifically designed to promote exports of manufactured products. Cedi's were temporarily suspended in August 1982. 2/

As applied before the 1982 suspension, Cedi's were granted for exports of selected products, according to the local content and export performance of the product. Articles subject to export taxes were not eligible. The tax rebate was 10 percent of the sales value when domestic content of the export in question exceeded 60 percent. When domestic content was between 50 and 60 percent the rebate was 5 percent. No Cedi's were issued when domestic content was below 50 percent. 3/ Cedi's could be applied against a

1/ According to the official gazette of Mar. 9, 1979, and subsequent amendments, this list is widely viewed as a definitive statement of the Government's specific industrial priorities and is also used in granting some nonfiscal incentives.

2/ Cedi's had been expanded briefly but were later suspended subsequent to the devaluation of the peso in September 1976. They were reinstated by the Portillo administration with modifications in April 1977. The 1982 suspension was partly to increase revenue and partly in reaction to U.S. Government imposition of countervailing duties on a number of Mexican imports benefiting from the certificates.

3/ Bela Balassa, Trade Policy in Mexico, World Development. vol II, No. 9, 1983 p. 802.

Table 60.--Mexico: Classification of industry by priority categories

CATEGORY IAgroindustry

Food processing

-Preparation, processing or manufacture of whole milk, cream, butter cheese, fruit, vegetables, meat and fish, wheat, soybean and corn flour, crackers, spaghetti, wheat bread, tortillas, and similar products, vegetable oils, lard, nutrients for preparation of foods, sugar, and ground or refined salt for household consumption.

Agricultural sector inputs:

-Manufacture of fish and seafood meal, animal feeds, chemical products, veterinary medicines, and biological products.

Other agroindustry products:

-Manufacture of chemical products derived from agriculture, forestry or fishing operations; cellulose; wooden parts or products industrial plants integrated to the forestry site.

Capital goods

Food production:

-Manufacture of food-processing equipment, wheel tractors, harvesters, agricultural implements, planes for fumigation.

Petroleum and Petrochemical industry:

-Manufacture of exploration and drilling equipment, valves, valve trees, connection pumps; motorized pumps, compressors, drilling compressors and blowers; pipe and tubing for drilling, support and processing; tubular heaters.

Electrical industry:

-Machinery and equipment for generation, transmission and distribution of electrical energy; hydraulic steam or gas turbines and electric generators; injection pumps for high-capacity boilers; metering and control equipment.

Mining and metallurgical industry:

-Manufacture of machinery and equipment for the extraction, concentration and refining of minerals; machinery and equipment for coking, pelletization and smelting of ferrous minerals; machinery and equipment for the production of metallic products based on sheets, wire and rods.

Construction industry:

-Manufacture of machinery and equipment for the construction industry and for earth moving and conditioning.

Transportation:

-Manufacture of diesel motors, truck tractors, medium and heavy trucks, trolley buses, and passenger buses, locomotives, cars and heavy equipment and installations for railroads, parts, and components.

-Construction of ships, other than for leisure use, parts and components.

Miscellaneous machinery and equipment:

-Manufacture of machine tools, carbon steel and alloy pipe and tubes, pumps, valves, connections, and transport belts for processing industries, measuring, control and laboratory equipment, synchronized direct current (DC) or alternating current (AC) electric motor of more than 1HP and controls, industrial boilers and heat exchangers, general-purpose diesel motors and components, machinery and equipment for the cement industry, the paper and cellulose industry, the textile, clothing and footwear industries, the plastic and glass industries, for industrial refrigeration, for materials handling, and packing, for pollution control for water wells, all-purpose speed-reducing equipment, metallic molds, casts, and dies. -Smelting, forging and forming parts for machinery and equipment or iron, steel and alloys. -Heavy machining, soldering and vatmaking.

Electronics industry:

-Manufacture of electronic telephone equipment, professional electronic equipment used in communications and industry, as well as components, all-purpose integrated circuits and electronic components, electronic data-processing equipment and components, electronic metering and control equipment.

Strategic industrial goods:

-Integrated manufacture of iron and steel. -Manufacture of cement.

Strategic health

-Manufacture of pharmaceutical products for the basic lists of medicines of the public sector, active pharmaceutical elements of medicinal products for human or veterinary use.

sector materials:

Table 60.--Mexico, classification of industry,
by Priority Categories (continued)

CATEGORY II

<u>Nondurable consumer goods</u>	
Textile and shoes:	-Manufacture of leather, cloth, and plastic shoes for popular consumption, yarn, woven and finished cloth of cotton and artificial fibers for clothing and domestic use for popular consumption, article of clothing or for domestic use for popular consumption, Bleaching, mercerizing, dyeing, printing, and finishing cloth for clothing and domestic use for popular consumption -Tanning of leather for articles of popular consumption.
Other nondurable consumer products:	-Manufacture of bath and laundry soaps and detergents, packaging and recipients of cardboard, glass and plastics, as well as tinplate for packaging food, paper, and cardboard. -Manufacture of school supplies, textbooks, and encyclopedias.
<u>Durable consumer goods</u>	
Household appliances and apparatus	-Manufacture of electric household appliances for popular use, household furniture and accessories for popular use, bicycles for popular use, motorcycles, except for sports models.
Transportation:	-Manufacture of parts and motors.
Service industries:	-Manufacture of optical apparatus and accessories, medical and hospital equipment and instruments, electronic and accessories for telephone communications, electronic equipment for commercial and office use, hand tools for different uses, industrial safety equipment.
Electrical industry:	-Manufacture of equipment and materials for the distribution of electricity, electrical power conductors, and wires.
<u>Intermediate goods</u>	
Petrochemical industry:	-Manufacture of fibers derived from petrochemicals products and raw materials, intermediate petrochemicals for general use, synthetic rubber and resins, plastifiers, and raw materials.
Chemical industry:	-Manufacture of basic acids and inorganic salts, chemical specialties derived from coking and coal and distilling coal tar, alkalis of sodium and potassium, metallic silicon and intermediates or organic silicon products, basic chemical elements and products based on nonmetallic minerals.
Mining and metallurgical industry:	-Smelting and refining of aluminum. -Smelting, refining, molding, and lamination of nonferrous metals and their alloys.
Construction industry:	-Manufacture of plate glass and plastic products for construction, bricks, roof tiles, and other clay products, construction materials based on cement for popular housing and urban infrastructure, bathroom and sanitary fixtures of clay or porcelain for popular use, conglomerates, and abrasives.
Other intermediate products:	-Manufacture of industrial refractories and abrasives, industrial gases -Industrialization of nonmetallic minerals, not subject to mining concessions.

Source: Price-Waterhouse, 1984, Doing Business in Mexico, p. 203.

wide range of Federal tax liabilities, including payroll taxes, value-added taxes, income taxes, and import duties. Cedi's or a similar tax measure may be reinstated once the Government has completed reevaluation of the program.

CEPROFI's

Unlike Cedi's, which served only for export promotion, Ceprofi's are designed to foster a variety of industrial development objectives. Ceprofi's are tax-credit certificates awarded to companies satisfying criteria for promoting development in priority regions, for engaging in priority economic activities, and for meeting more general industrial development goals.

Introduced in 1979, Ceprofi's are issued for the first 5 years of a new investment and can be used to pay any type of Federal tax. The amount of Ceprofi tax credits for plant and equipment, varies from 10 to 20 percent of investment costs, depending on whether the project involved a new plant or an expansion. Credits to small business are granted for 25 percent of investment costs. ^{1/} Ceprofi's are also issued for the creation of new jobs. These employment credits amount to 20 percent of the incremental labor cost and cover a period of 2 years. The regulations establishing the sectoral priorities for tax incentives such as Ceprofi's were issued in 1979 (see table 61 above). Table 61 summarizes the percentages of investment or labor costs for which Ceprofi's may be awarded when the above criteria are met.

In June 1981, a new decree extended Ceprofi incentives to nonpriority industries. Before this, only industries classified as category I and II priorities were eligible (see table 60). The decree also provided for granting additional tax rebates, amounting to either 5 or 10 percent of investment, at the discretion of the Government.

Table 62 shows the amount of Ceprofi's issued for actual investment between 1979 and 1981 by type of manufacturing industry. Nonmetallic minerals, basic metals, chemical products--all intermediate goods-- accounted for over 70 percent of the total credits.

Mexican companies must undertake a variety of obligations to qualify for Ceprofi tax incentives. First, a company must have credits for its investment approved by the Tax Incentives Office of the Ministry of Commerce and Industrial Development (Secofin). In addition, an applicant must register with Secofin under an approved development program for the industry in question. In enlisting with the industry development program, the company assumes the goals of the plan and incurs obligations and commitments which commonly include performance requirements related to increasing production, required domestic content levels, share of production to be exported, as well as price undertakings.

^{1/} Small industry is being defined in terms of its fixed assets' value, which must not exceed 200 times the annual minimum wage in the Federal District.

Table 61.--Mexico: Summary of principal tax incentives for industrial investment under original 1979 decrees

Geographic location of investment 1/	Priority sectors		All industrial activities	
	Small enterprises 2/	Activity category I 3/	Activity category II 4/	Purchase of local equipment : by additional shifts
Zone I Preferential.	:25 percent investment: :20 percent investment: : : : :	:20 percent investment: :20 percent investment: : : : :	15 percent investment 20 percent employment : : : :	: 5 percent : : : : : : 20 percent additional employment.
Zone II State Priorities:	:25 percent investment: : : : : :	:20 percent investment: :20 percent employment: : : : :	10 percent investment 20 percent employment : : : :	: 5 percent : : : : : : 20 percent additional employment.
Rest of the country	:25 percent investment 5/ : : : : :	:20 percent investment: :20 percent employment: : : : :	10 percent investment 5/ 20 percent employment 5/ : : : :	: 5 percent : : : : : : 20 percent additional employment.
Zone III				
A. Controlled growth.	: : : : : :	: : : : : :	: : : : : :	: : : : : :
B. Consolidated growth.	:25 percent investment 5/ : : : : :	:20 percent investment 5/ :20 percent employment 5/ : : : :	10 percent investment 5/ 20 percent employment 5/ : : : :	: 5 percent : : : : : : 20 percent additional employment.

1/ Geographical zones are defined in the decree published in Diario Oficial, Feb. 2, 1979. Fiscal credits can be used for the payment of any Federal tax which is not imposed for a specific use. The percentages shown in the table for investment are applied to the total value of construction and installations and the purchase of new machinery and equipment directly related to the production process; it is granted at the time of undertaking of the expenditure. In the case of employment, the percentage is applied for a period of two years on the new employment valued at the annual minimum wage. These zones are:

IA. Industrial port areas, which include Lazaro Cardenas (Michoacan), Salina Cruz (Oaxaca), Tampico (Tamaulipas), Coatzacoalcas (Veracruz) and many contiguous municipalities.

IB. Urban industrial development areas, including 99 municipalities in 20 states, largely concentrated on the Pacific coast, the Isthmus of Tehuantepec, the Reforma Oilfields, certain areas on the Gulf Coast, a few semi-industrialized areas in the central part of the country but excluding Guadalajara, Monterrey, and Mexico City, and 18 municipalities in the northern border strip.

II. State priority areas: Municipalities in this zone will be selected in agreements between the Federal Government and each State Government.

IIIA. Areas of restrained growth: Mexico City (the Federal District) and 22 surrounding municipalities in the State of Mexico, plus one in Hidalgo. There will be no encouragement of growth in this zone.

IIIB. Areas of consolidation, with only limited encouragement of expansion of existing companies, comprising 144 municipalities in the States of Hidalgo, Mexico, Morelos, Puebla and Tlaxcala surrounding zone IIIA.

2/ Enterprises with fixed assets not exceeding 200 times the annual minimum salary in the Federal District.

3/ Includes agroindustries, capital goods producing industries and strategic inputs for the industrial sector (e.g., steel, cement).

4/ Includes non-durable consumer goods, durable consumer goods and intermediate products listed in Diario Oficial, Mar. 9, 1979.

5/ Applied only to expansions of productive capacity in the same industrial activity.

Source: Secretaria de Patrimonio y Fomento Industrial, Plan Nacional de Desarrollo Industrial, 1979-82 (Mexico, 1979) p. 181.

Table 62.--Mexico: Manufacturing industries, CEPROFI's issued for actual investments, 1979-81

Industry	Amount	Percent of total
	Million pesos	
Food, beverage, and tobacco-----	387.1	3.5
Textiles, shoes, and clothing-----	581.7	4.7
Wood products-----	223.9	2.0
Paper and printing-----	329.5	3.0
Chemical products-----	1,204.4	11.0
Rubber products-----	157.4	1.4
Petroleum and coal derivatives-----	65.6	.6
Nonmetallic minerals-----	4,399.9	40.3
Basic metals-----	2,298.7	21.0
Metal products-----	230.7	2.1
Nonelectric machinery and equipment-----	498.0	4.6
Electric & electronic machinery-----	216.6	2.0
Transport equipment-----	381.7	3.5
Other manufactures-----	16.7	.2
Total-----	10,929.0	100.0

Source: Secretaria de Hacienda y de Credito.

One major restriction on Ceprofi benefits is that a company must not be receiving any other tax benefit on the same investment. Such other taxes include Federal tax benefits, local taxation incentives, or reductions of import duties. The company could, however, continue to receive import duty reductions implemented under special economic circumstances, such as severe shortages of raw materials and parts.

In some circumstances, Ceprofi's can be classified as a subsidy to a specific industry, but in other applications, they promote industry in a more general fashion. When investigating Mexican imports under U.S. countervailing duty legislation, the U.S. Department of Commerce found that certain imports frequently benefited from industry-specific or region-specific Ceprofi's. In such cases, these benefits were determined to be countervailable. ^{1/} In other cases, the Commerce Department found that Ceprofi's had been awarded on equal terms with all other companies participating in a development program which served the macroeconomic objectives of Mexico. Such instances were determined not countervailable under the U.S. statute.

^{1/} For example, the Commerce Department determined that certain brick and float glass imports from Mexico were countervailable because the companies received CEPROFI's on the basis of priority product designations. The duty assessed with respect to CEPROFI benefits was 0.35 percent ad valorem for bricks and 1.02 percent for float glass. Imports of pectin from Mexico were also found countervailable for receiving CEPROFI benefits on the basis of plant location alone. The duty with respect to pectin was assessed at 0.68 percent ad valorem.

Tax depreciation

Straight-line depreciation.--Beginning in 1983, straight-line depreciation rates were redesigned to encourage capital investment more effectively. Depreciation rates are generally higher on investments in equipment for research, new product development, pollution control, computers, construction, textile manufacturing, and power conversion. For example, table 63 shows the depreciation rate of computers and construction-related transport equipment at 25 percent per year. Equipment for pollution control, research, and fuel or gas conversion can be depreciated at a 35-percent rate.

Table 63.--Mexico: Straight-line tax depreciation rates

(In percent)	
Type of asset	: Rate per : annum
Intangible fixed assets and deferred charges not related to a specific contract.	: 5
Deferred expenses, including certain payments for patents trademarks, technical assistance, or transfers of technology and preoperating expenses.	: 10
Fixed assets normally used by business enterprises:	:
Buildings and substructures-----	: 5
Railroads and ships (except for transportation companies)----	: 6
Furniture and office equipment-----	: 10
Buses-----	: 11
Airplanes, except for aviation companies-----	: 17
Heavy-duty trucks and trailers, automobiles and light trucks, except those used by the construction industry.	: 20
Computers-----	: 25
Peripheral computer and punchcard equipment-----	: 12
Equipment for the control of pollution-----	: 35
Equipment for research and product development-----	: 35
Tool, dies-----	: 35
Equipment for conversion to or consumption of fuel oil or natural gas-----	: 35
Machinery and equipment:	:
Production and distribution of electricity; electric transportation equipment.	: 3
Processing grain products, sugar and its products, vegetable oils and products; ocean, river and lake transportation companies.	: 5
Manufacture of products derived from coal; primary metallic products; tobacco products.	: 6
Production of petroleum and natural gas; paper and similar products.	: 7

Table 63.--Mexico: Straight-line tax depreciation rates--Continued

(In percent)	
Type of asset	: Rate per : annum
Manufacture of motor vehicles and parts; railroad and ship construction; manufacture of metal products; machinery; scientific and professional instruments; production of food and beverages (except grains, sugar, vegetable oils, and their products).	: 8
Tanning and manufacture of leather products; chemical products; manufacture of basic products for plastic rubber products; printing and publishing; pharmaceuticals.	: 9
Manufacture of clothing and textiles; finishing and dyeing-----	: 11
Construction of airplanes; transportation companies (freight and passenger).	: 12
Air transportation companies; radio and television transmission----	: 16
Construction industry, including heavy-duty trucks and trailers, automobiles and light trucks.	: 25
Farming-----	: 20
Cattle raising-----	: 11
Chicken, hog raising, etc-----	: 25
Other types of activities not specified above-----	: 10

Source: Price Waterhouse, Doing Business in Mexico, 1983

Note.--In the case of the enterprises whose operation include more than 1 of the types of business activities mentioned in the law, the rate of depreciation that should be used will be that which is provided for the principal activity, determined on the basis of the relative volume of income in the previous year.

Accelerated depreciation.--Under recent amendments to the 1983 income tax law accelerated depreciation tax benefits are slated to progressively incorporate regional and industrial priorities as qualifying criteria. New fixed assets may be depreciated at 75 percent of their value for 1984 and at 50 percent of their value in 1985 regardless of the zone of location or type of activity. However, fixed assets acquired in 1986 may be depreciated at 50 percent that year if in a priority zone and 25 percent otherwise. After 1986 accelerated depreciation will apply only to fixed assets in priority industrial activities; at rates of 50 percent in priority zones and at 25 percent in nonpriority locations. A firm may not apply accelerated depreciation to fixed assets which already have been subject to other priority-linked tax incentives or subsidies.

Value-added tax

Value-added taxes (VAT), instituted in January 1980, replaced a number of gross receipts and excise taxes. VAT is applied to domestic sales and imports of goods and services. In the case of imports, VAT is levied in addition to import duties. The general rate of VAT is 15 percent but rates vary depending on the product concerned. A rate of 20 percent is applied to goods considered

luxury items. A rate of 6 percent is now applied to essential items including many foods and all medicines. 1/ A number of food items are subject to a zero VAT rate.

Transactions in certain industrial sectors are taxed at a zero rate. The majority of transactions with a zero rate are sales of food and agricultural equipment, inputs, and farming services. The zero rate is also applied, however, to the export of services such as technical assistance, in-bond assembly, publicity, insurance and bonding, and financial operations as well as to international freight and international (outside Mexico) air passenger service.

Some transactions such as sales of certain products and services and sales by certain entities, are exempt from VAT. Exemptions to VAT include sales of Government and public services, professional medical services, public entertainment, and educational services. VAT taxes also do not apply to sales of land and residences, sales of construction materials, publications, credit instruments, and sales by labor unions' nonprofit stores, farmers' groups, and governmental agencies.

The Financial System

Financial incentives granted by the Mexican Government are an important element of industrial promotion policy. Through its official banking institutions, the Government promotes industry by granting discounted loans to and purchasing shares in private enterprises. With the current severe credit squeeze, Government influence over credit policies is key to implementing the economic adjustment program. Nationalization of the banking industry has enhanced this influence.

Nationalization of the banking system was one of the emergency measures taken at the peak of the debt crisis in September 1982. At that time, the Government took over 35 banks, of which 32 were full-service, privately owned banks and three were banks of mixed private and public ownership. 2/ The branches of Citibank (the only foreign bank with banking operations in Mexico) and the representative offices of other foreign banks, (restricted from carrying out banking operations) were not affected.

Under the nationalized system, Mexico's banks are to have full autonomy in administration. However, the responsibility for banking and monetary policy rests with the financial authorities. These authorities consist of the Treasury Secretariat, the central bank, the National Banking and Insurance Commission, and the National Securities Commission. Formerly private banks are referred to as the commercial banking sector and are expected to operate on a commercial basis. Public financial institutions are the instruments for implementing Government credit policies and programs.

1/ A rate of 4 percent was applied previously to these products.

2/ Since the banking system nationalization in September 1982, the Government has merged some banks to increase efficiency, however, the system continues to operate in most ways the same as before nationalization. Indemnification of shareholders of nationalized commercial banks is almost complete. Divestiture of nonbanking activities the Government acquired in the nationalization process is beginning with former bank shareholders being given first choice in bidding and allowed to use their indemnification bonds as payment.

The major official Government banks with impact on industrial development include: the industrial development bank, Nacional Financiera (Nafinsa); the foreign trade bank, Banco Nacional de Comercio Exterior (Bancomext); and the nation's central bank, Banco de Mexico. Other important official banks are Banrural, which finances agriculture, and Banobras, which finances public works.

In 1976, the banking laws were amended to allow full service banking activities and the banking system expanded rapidly. At the time of nationalization, the system consisted of about 4,500 branches located in more than 600 cities throughout Mexico, as well as 22 agencies in foreign countries. Assets of commercial banks represented almost 60 percent of total banking system assets in 1982 and about 50 percent in 1983. In terms of lending activities (table 64), commercial sector banks accounted for over 2.6 trillion pesos, or more than 55 percent of total lending in 1983; development banks loaned over 1.9 trillion pesos. Commercial bank lending was concentrated in manufacturing (22 percent of total industrial lending) and commerce (18 percent). Development banks reflected national priorities on infrastructure and agriculture, concentrating their loans most heavily in agriculture (12 percent), electricity (25 percent of industrial lending), and transport (13 percent). Only 0.5 percent of development bank lending was allocated to commerce.

As a member of the World Bank (IBRD) and the Inter-American Development Bank (IADB), Mexico receives economic development loans and technical assistance from these institutions. The first IBRD loan made to Mexico was \$24.1 million in 1949 for hydroelectric generation. The first IADB loan was made in 1961 for a trust fund to promote small and medium industry. By the end of 1982, the accumulated total of lending to Mexico by both institutions was almost \$8.9 billion for 187 loans.

More than \$1.7 billion of this total has been channeled through official trust funds for promoting Government economic priorities. Nacional Financiera, Banobras, the Federal Electricity Commission, and the national railroad are the major borrowers of these international funds. According to the Bank of Mexico, The Government directed a large portion of these funds to the heavy industry and capital goods sectors of the economy in 1982, as shown in the following tabulation:

Sector	: Percent : of total	::	Sector	: Percent : of total
IADB: <u>1/</u>	:	::	IBRD: <u>2/</u>	:
Heavy industry-----	62.7	::	Irrigation and	27.4
Public services-----	26.4	::	sewerage.	:
Transport and communication--	7.5	::	Agriculture,	26.0
Fisheries	.4	::	rural	:
Other-----	3.0	::	development--	:
Total-----	100.0	::	Capital goods---	23.2
:	:	::	Education--	13.7
:	:	::	Public services--	9.1
:	:	::	Total-----	100.0
:	:	::	:	:

1/ IADB loaned to Mexico a total of \$320 million.

2/ IBRD loaned to Mexico a total of \$567.7 million.

Table 64.--Mexico: Credit received through development and commercial banks, by economic sector, 1983

Sectors	(In millions of pesos)					Percent of total
	Total	Percent	Development Banks	Percent	Commercial Banks	
Agriculture and livestock-----	430,448	9.3	237,087	12.0	193,361	7.3
Mining-----	122,743	2.7	96,849	4.9	25,895	1.0
Others-----	10,848	0.2	4,476	0.2	6,372	0.2
Industrial:						
Petroleum-----	303,117	6.6	168,926	8.5	134,191	5.0
Electricity-----	571,845	12.4	499,287	25.3	72,558	2.8
Manufacturing-----	837,190	18.1	244,955	12.4	592,235	22.4
Nonmetallic mineral products-----	45,627	1.0	6,220	0.3	39,407	1.5
Steel, metal products and artifacts-----	180,895	3.9	76,219	3.9	104,676	4.0
Electrical machinery and appliances-----	62,357	1.4	11,140	0.7	51,217	1.9
Construction industry-----	152,550	3.3	16,432	0.8	136,118	5.2
Total-----	2,153,581	46.6	1,023,179	51.7	1,130,402	42.8
Welfare-----	142,383	3.1	9,768	0.5	132,615	5.0
Services and other activities:						
Transport-----	288,201	6.2	255,574	12.9	32,627	1.2
Communications-----	10,294	0.2	500	0.0	9,794	0.3
Cineamatography and other ...						
de esparcimiento-----	9,583	0.2	3,215	0.2	6,368	0.2
Banking services-----	252,777	5.5	96,204	4.9	156,573	5.9
Otros intermediarios-----	173,249	3.8	147,007	7.4	26,242	1.0
Other activities-----	535,970	11.6	93,346	4.7	446,624	16.9
Total-----	1,274,074	27.6	595,846	30.1	678,228	25.7
Commerce-----	484,560	10.5	10,404	0.5	474,156	18.0
Grand Total-----	4,618,637	100.0	1,977,609	100.0	2,641,028	100.0

Source: Banco de Mexico.

Note.--Because of rounding, figures may not add to the totals shown.

A family of government trust funds, or fideicomisos, offers selective channeling of credit according to Government policy priorities. Since the 1920's, the Government has set up these specialized funds to encourage economic activities that the Government considers short of finance. Each trust fund has its own specific range of programs and set of principal objectives. Some are oriented toward small- and intermediate-sized industry, others assist specific sectors such as agriculture or certain industries such as tourism, and several are aimed generally at promoting industrial production for the domestic market and or for export. Most of the programs reserve funds for companies with majority (51 percent) Mexican ownership based on the view that foreign-owned companies have easier access to external sources of credit.

Trust funds provide preferential financing by a rediscounting of the funds channeled through them. Interest rates on trust fund loans are heavily subsidized in some programs and approach private bank lending rates in others. For example, programs lending at extremely favorable rates charge substantially less than the average rate the banking system pays for its funds, known as Costo Porcentual Promedio de Captacion (CPP). Other programs charge the full rate of CPP plus or minus up to 5 points. An interest rate of CPP plus 5 percentage points would be closer to free-market rates. 1/

Responsibility for administering trust funds rests with the principal official banks. These funds may be provided by the administering bank directly or indirectly through commercial bank lines of credit. The major funds relevant to industrial development are listed below under their administering banks:

Banco de Mexico

Ficorca Trust Fund for the Coverage of Exchange Risks
(Fideicomiso para la Cobertura de Reagos
Cambiarios)

Fonei Fund for Industrial Development (Fondo de
Equipamiento Industrial)

Nafinsa

Fogain Fund for the Guarantee and Development of Small and
Medium Industry (Fondo de Garantia y Fomento a la
Industria Mediana y Pequena)

1/ Interest rates on most peso denominated loans are based on the average rate the banking system pays for its funds, the Costo Porcentual Promedio de Captacion de Moneda Nacional (CPP). Mexico's CPP stood at 56.4 percent in December 1983. In the same month, the average of nominal annual interest rates charged on loans by commercial banks was 62.7 percent. In this month, for example, a trust fund loan at CPP plus 5 would incur an interest rate of 61.4, about 1.3 percentage points below average nominal commercial rate. Average effective commercial interest rates, however, are generally much higher, i.e. at 91.2 percent in December 1983. In calculating effective rates, the Bank of Mexico takes into account bank fees and charges and the effect of compounding of interest, among other things. The U.S. Department of Commerce has compared nominal rates to determine the amount of subsidy provided by Mexican discounted loans, but has also taken into consideration the banking fees a private borrower must pay.

Fomin	National Fund for Industrial Development (Fondo Nacional de Fomento Industrial)
Fidein	Trust Fund for the Study and Growth of Commercial Centers, Industrial Parks and Cities (Fideicomiso para el estudio y fomento de conjuntos, parque, y ciudades industriales)
Fonep	National Fund for Preinvestment Studies and Projects (Fondo Nacional de Estudios y Proyectos de Preinversion)
Boncomext	
Fomex <u>1/</u>	Fund for the Development of Exports of Manufactured Goods (Fondo para el Fomento de las Exportaciones de Productos Manufacturados)

The sections that follow describe the major official banks and the industry-related trust funds administered by each. 2/

Bank of Mexico

In its capacity as Mexico's central bank, the Bank of Mexico issues currency, regulates international reserves and foreign-exchange transactions and is the reserve bank and clearinghouse for national credit institutions. The bank of Mexico uses its control over bank reserves to influence the flow of credit in the banking system.

One program in which this influence is exercised implements Article 94 of the Banking Law. Article 94 requires that at least 25 percent of all commercial banking liabilities are channeled by the Bank of Mexico into specific types of loans designated by the Bank of Mexico. These designated loans must be directed toward priority sectors of the economy. For each sector, these loans must represent a specified percentage of the banks' resources and carry interest rates no higher than the maximum level assigned by the central bank. The Bank of Mexico also requires that 1.2 percent of these liabilities are reserved for export financing with maximum interest rates of CPP minus 5 percentage points.

The Bank of Mexico also maintains a line of credit to be used for the export of primary products. This is known as the 1.6 line of credit, referring to its implementing legislation.

1/ Until recently, Fomex had been administered by the Mexican Treasury, with the Bank of Mexico acting as a trustee. On July 27, 1983, Fomex was formally incorporated into the National Bank of Foreign Trade.

2/ Both the Bank of Mexico and Nafinsa administer a wide range of other trust funds but only those related to industry will be mentioned here.

Ficorca. 1/--The Ficorca trust fund, administered by the Bank of Mexico, includes various programs to cover exchange-rate risks for private companies. It has been used as an instrument to reschedule private sector debt to foreign commercial banks. 2/ Ficorca facilitates repayment of debt by permitting Mexican companies to purchase U.S. dollars or other hard currencies for pesos at favorable terms for repayment of foreign debts. Participation in the scheme requires that the companies arrange with their creditors to stretch out their loans over 6 to 8 years, with a few years' grace period.

Fonei.--Fonei is a development trust fund which grants long-term credit at below-market rates to foster the creation or modernization of industrial firms. This goal is achieved by financing technological development programs, preinvestment studies, and the acquisition of fixed assets. Of all credit authorized by Fonei in 1980, 14 percent was allocated to promote export production, 53 percent to promote import substitution, and 33 percent for projects involving both. 3/

Certain industries stood out in the structure of Fonei lending in 1983. Table 66 shows that all Fonei programs heavily favored metal industries due to the emphasis on promoting the development of the capital equipment sector. In each of the programs (see table 65), metal machinery and equipment absorbed more than 30 percent of credits granted during 1983. Some programs granted considerable resources to services industries, textile industries, and chemicals.

The U.S. Department of Commerce found in several countervailing cases concerning imports from Mexico that such imports benefited from selective financial assistance under Fonei. In recent examples, the Commerce Department determined the existence of Fonei-related bounties or grants amounting to 0.17 percent ad valorem for iron castings, 0.04 percent for carbon black, and 0.18 percent for bricks.

Nafinsa

Nacional Financiera is the leading official lending institution for fostering industrial development. It is the repository of most foreign currency loans to the Mexican Government. As shown in table 66, regular lending activities accounted for 69 percent of funds used by Nafinsa in 1983. Loan guarantees represented almost 15 percent of funds used. Allocation of Government trust funds represented only about 5 percent of Nafinsa's total use of funds in 1983. Equities, security investment, and other assets accounted for the remainder.

1/ Ficorca was determined by the U.S. Department of Commerce not to be countervailable under U.S. law because the program is available on an equal basis to all Mexican firms with foreign debts and is not tied to exports. See Federal Register, vol. 49, No. 108 p. 23099.

2/ The private sector debt renegotiated under Ficorca by the end of October 1983 reportedly involved 1,200 Mexican debtor companies, and obligations to more than 500 creditors.

3/ Business Mexico, 1981, p. 198.

Table 65.--Mexico: Credit granted under FONEI program during 1983

Industry	Equipment	Percent : of total:		Technological development : Million pesos		Percent : of total:		Preinvestment studies		Percent : of total	
		:		:		:		:		:	
Metal machinery and equipment	3,367.55	45.04	:	540.31	:	32.11	:	3.46	:	40.05	:
Food, beverages and tobacco	896.40	11.99	:	11.00	:	.65	:	1/	:	1/	:
Chemicals, and petrochemicals	870.89	11.65	:	99.19	:	5.89	:	1.20	:	13.89	:
Basic metal industries	868.49	11.62	:	1/	:	1/	:	1.87	:	21.64	:
Paper, printing and editorial	522.90	6.99	:	15.32	:	.91	:	-	:	-	:
Nonmetallic mineral products	378.15	5.06	:	214.98	:	12.78	:	1.38	:	15.97	:
Textiles and apparel	190.10	2.54	:	-	:	-	:	.73	:	8.45	:
Other manufacturing	-	-	:	12.00	:	0.71	:	1/	:	1/	:
Wood and wood products	382.57	5.12	:	1/	:	1/	:	-	:	-	:
Construction	1/	1/	:	18.00	:	1.07	:	1/	:	1/	:
Services	1/	1/	:	771.90	:	45.87	:	1/	:	1/	:
Total	7,477.05	100.00	:	1,682.70	:	100.00	:	8.64	:	100.00	:
<hr/>											
Industry	Capacity	Percent : of total:		Special program 2/ : Million pesos		Percent : of total:		Total		Percent : of total	
		:		:		:		:		:	
Metal machinery and equipment	176.72	60.79	:	2,551.96	:	47.80	:	6,640.0	:	44.9	:
Food, beverages, and tobacco	1/	1/	:	325.00	:	6.09	:	1,232.4	:	8.3	:
Chemicals, etc.	24.00	8.26	:	239.70	:	4.49	:	1,235.0	:	8.3	:
Basic metal industries	1/	1/	:	150.00	:	2.81	:	1,020.4	:	6.8	:
Paper, printing and editorial	1/	1/	:	222.50	:	4.17	:	760.7	:	5.1	:
Nonmetallic mineral carbon products	90.00	30.96	:	214.50	:	4.02	:	899.0	:	6.0	:
Textiles and apparel	1/	1/	:	1,420.00	:	26.60	:	1,610.8	:	10.8	:
Other manufacturing	1/	1/	:	20.00	:	.37	:	32.0	:	0.2	:
Wood and wood products industries	1/	1/	:	175.00	:	3.28	:	557.6	:	3.8	:
Construction	1/	1/	:	20.00	:	.37	:	38.0	:	0.3	:
Services	1/	1/	:	1/	:	1/	:	771.9	:	5.2	:
Total	290.72	100.00	:	5,338.66	:	100.00	:	14,797.8	:	100.0	:

1/ No financing reported in these industries in 1983.

2/ A special financing program established to help firms surmount short-term liquidity problems experienced after the debt crisis. Of the total for this program, about 2.3 billion pesos were for working capital and about 3 billion pesos were for debt restructuring.

Source: Fonei, Annual Report, 1983.

Table 66.--Mexico: Nafinsa, uses of funds in 1983

Use	Amount	Percent of total
	Million pesos	
Financial:	1,690,982	80.0
Loans-----	1,455,556	68.9
Equity investment-----	55,432	2.6
Securities-----	27,610	1.3
Short-term investments-----	67,315	3.2
Other assets-----	85,069	4.0
Trust funds-----	108,654	5.2
Guarantees-----	313,625	14.8

Source: Nacional Financiera, Annual Report 1983

The priorities promoted by trust fund financing cause the structure of the loan portfolio to differ from that of regular loan channels. In Nafinsa's regular loan portfolio, the total percentage of loans directed to industries, at 42 percent, is about equivalent to that of commercial banks in 1983. In regular lending, the electric power industry, basic iron and steel industries, and transportation received the highest amounts of financing (see table 67). For trust fund lending, however, industry accounts for about 65 percent of the total for all programs. The manufacturing industries of food processing, textiles, and metal and electrical machinery together accounted for a higher proportion of industrial trust fund loans.

Acquisition of stock, another of Nafinsa's industrial promotion activities, represented about 4 percent of financing activities in the 1983 fiscal year. The Nafinsa Industrial Group, made up of 86 companies, accounts for most of Nafinsa's stock holdings. ^{1/} The share of Nafinsa in these companies amounts to over 120 million pesos, or 42.7 percent of their total capital stock. Broken down by type of industry, companies most prominent in Nafinsa's portfolio include: machinery, mechanical equipment, and spare parts, 16 firms; iron and steel, 11 firms; chemical industries, 10 firms; machinery, electrical and electronic equipment and parts, 8 firms.

Fogain.--Fogain finances the acquisition of fixed assets and working capital and is specifically designed to develop small- and medium-sized businesses. Fogain is one of the largest industrial funds with total disbursed loans in fiscal year 1983 totaling over 52 million pesos. The distribution of lending favored manufacturing of food products, textiles, and apparel, metal, and electrical products, and machinery.

^{1/} About 1.2 percent of Nafinsa shareholding is carried out under the trust fund programs authorized to acquire stock as a part of their financing activities.

Table 67.--Mexico: Nafinsa financing granted, by sources,
and industrial activities, 1983 1/

Branch of activity	Trust funds				Loans Granted				Loan guarantees			
	Amount		Percent		Amount		Percent		Amount		Percent	
	Million	pesos	of total	of total	Million	pesos	of total	of total	Million	pesos	of total	of total
Basic industry:												
Oil and coal	--	--	--	--	10,114.1	--	8.3	--	--	--	--	--
Electric power	--	--	--	--	21,873.3	--	17.8	--	499.2	--	--	1.8
Iron and Steel	1,358.5	--	2.5	13,836.1	11.3	--	11.3	--	1.3	--	--	.0
Transportation	--	--	--	--	16,283.6	--	13.3	--	10,981.0	--	--	39.0
Cement and building mat.	--	--	--	--	204.7	--	.2	--	182.3	--	--	.6
Nonferrous metals	4,590.8	--	8.5	11,533.8	9.4	--	9.4	--	8,171.0	--	--	29.0
Mining	--	--	--	--	15,505.6	--	12.7	--	260.3	--	--	0.9
Other manufacturing:												
Food products	11,044.7	--	20.3	1,150.0	--	--	.9	--	--	--	--	--
Textiles and apparel	12,212.6	--	22.5	2,431.7	1.9	--	1.9	--	17.9	--	--	.1
Wood and cork	1,377.8	--	2.5	61.8	--	--	.1	--	--	--	--	--
Furniture and accessories	2,206.3	--	4.1	--	--	--	--	--	--	--	--	--
Cellulose and paper	461.0	--	.9	2,003.0	--	--	1.6	--	--	--	--	--
Printing, lithographing and publishing	1,421.8	--	2.6	--	--	--	--	--	--	--	--	--
Chemical products	3,263.2	--	6.0	1,044.0	--	--	.9	--	2,761.2	--	--	9.8
Metal and electrical products and machinery	9,702.0	--	17.9	8,626.5	--	--	7.0	--	1,490.7	--	--	5.3
Transportation equipment	1,995.7	--	3.7	17,900.2	--	--	14.6	--	3,785.1	--	--	13.4
Others	4,659.8	--	8.6	--	--	--	--	--	--	--	--	--
Total 2/	54,294.6	--	100.0	122,568.4	--	--	100.0	--	28,150.0	--	--	100.0

1/ Nafinsa's fiscal year runs from July 1, 1982, to June 30, 1983.

2/ Industry total represents about 42 percent of the total balance for loans as of end of June 1983, about 97 percent for guarantees, and about 65 percent for trust funds. Infrastructure and services take up the remaining balances.

Source: Nacional Financiera, Annual Report 1983.

Interest rates of Fogain loans are more favorable if the recipient is engaged in a priority industrial activity or is located in a priority zone. The Department of Commerce has determined that if it were not for these types of restrictions on preferences, Fogain loans would not be countervailable under U.S. law because all small- and medium-sized businesses are otherwise eligible. ^{1/}

Fomin.--Fomin provides funds for industrial development either through stock acquisition or loan provision. A little over 1 billion pesos was channeled to industry through Fomin in fiscal 1982/83 (see table 68). In 1983, Fomin's stock portfolio in 113 companies was worth 3.3 billion pesos. The sectoral distribution of lending under Fomin echoed that of Fogain, with leading recipients in the food, textiles, metal, and electrical products, and equipment industries.

Table 68.--Mexico: Fogain and Fomin financing granted, by economic sectors, 1983

(In millions of pesos)					
Sector	Fogain	Percent	Fomin	Percent of total	
Iron and steel-----	1,258.5	2.4	100.0	8.4	
Nonferrous metals-----	4,402.2	8.4	-	-	
Food products-----	9,883.7	18.9	403.2	33.7	
Textiles and apparel-----	12,079.6	23.1	133.0	11.1	
Wood and cork-----	1,342.8	2.6	35.0	2.9	
Furniture and accessories---	2,206.3	4.2	-	-	
Cellulose and paper-----	447.6	0.9	13.4	1.1	
Printing, lithographing, and publishing-----	1,421.8	2.7	-	-	
Chemical products-----	3,185.8	6.1	77.8	6.5	
Metal and electrical products and machinery-----	9,552.0	18.3	150.0	12.5	
Transportation equipment-----	1,995.7	3.8	-	-	
Others-----	4,496.9	8.6	162.9	13.6	
Cement and building materials-----	-	-	121.2	10.1	
Total-----	52,272.9	100.0	1,196.5	100.0	

Source: Nacional Financiera, Annual Report 1983.

Fidein.--Fidein is designed particularly to assist regional decentralization of industry. It promotes the development of industrial parks and cities, offering land to manufacturers at preferential prices and on an installment basis. The trust also finances the renting of machinery on either a net lease or a lease-with-a-purchase option basis for investors that are locating in an industrial park. Fidein has also become one of the main instruments of the Mexican Government's regional decentralization strategy. Fidein financed 768.6 million pesos in sales of land in industrial parks and 189.1 million pesos in physical installation finance during the 1982/83 fiscal year.

^{1/} Federal Register, vol 49, No. 90 p. 19566.

Fonep.--Fonep primarily finances feasibility studies. Fonep is the smallest of Nafinsa's industrial finance instruments. It financed a total of almost 638 million pesos in feasibility studies in 1982/83 fiscal year. The highest amount of financing, 396 million pesos, went to industry studies. About 175 million pesos was allocated to studies for services industries.

Bancomext

Bancomext is the official export-import bank of Mexico. With total assets of over 530 billion pesos, it is the principal government finance institution for facilitating nonoil exports. Bancomext establishes lines of credit with foreign countries for import purchases and administers Fomex, a Government trust fund for preferential trade financing. Export-import finance in Mexico is broadly defined to include various financing measures that will help the balance-of-payments standing. Thus, Bancomext also provides production finance that will promote import substitution and expand the export potential of firms.

Through Bancomext and its subsidiary Fomex, a total of almost 238 billion pesos in loans had been granted as of the end of June 1983. Support for imports was the largest program at over 91 billion pesos, or 38 percent of all credits. Export financing had reached a level of over 73 billion pesos, or 31 percent of all lending. The total amount of financial support and guarantees to foreign trade of Bancomext and Fomex programs projected for 1984 are (in millions of pesos)--

	<u>Value</u>
Bancomext-----	641,000
Fomex-----	469,000
Less interinstitutional transfers	<u>-160,000</u>
Total-----	950,000

Bancomext has two programs set up with lines of credit from the World Bank that finance imports related to export production. These programs are Profide, Program for the Financing of Foreign Exchange for Exports (Programa de Financiamiento de Divisas para Exportaciones), and Fife, Program for the Financing of Fixed Investment for Exporters (Programa de Financiamiento de Inversiones Fijas para Exportadores). Profide finances foreign exchange for the import of products to be used to produce exports. Interest rates on Profide loans are 3 percentage points above the New York banker's acceptance rate. Fife funds Mexican businesses for the import of equipment for use either in the manufacture of exports or in services which generate foreign exchange such as tourism. The World Bank lines of credit for these two programs amount to \$350 million.

Some of Bancomext funds are loaned at preferential rates. About 30 percent of total export financing is estimated to be made at preferential rates and about 70 percent at commercial rates. About 50 percent of import financing is estimated to be lent at preferential rates. ^{1/}

^{1/} A Department of Commerce cable attributes these estimates to Bancomext sources.

Fomex.--The Fund for Growth of Exports of Manufactured Products (Fondo para el Fomento de las Exportaciones de Productos Manufacturados) subsidizes principally manufactured exports in the short term. Fomex is a Federal trust fund established by the Government of Mexico in the early 1960's to promote the manufacture and sale of products for exports. Fomex has steadily increased in importance. In 1983, its total financing reached 259.5 billion pesos.

Fomex finances both export and import purchases related to preexport activities and import substitution. It also provides risk guarantees for exports. Export sales financing is the largest Fomex program. Fomex disbursed 165 billion pesos in export sales financing in 1983, compared with about 60 billion pesos for preexportation and about 68 billion for import substitution. Much of Fomex financing is offered at highly favorable terms, but both terms and eligibility requirements differ for each program.

For export sales financing the minimum rate for short-term dollar credit (less than 2 years maturity) now stands at 70 percent of the 6 month Libor rate. Long-term export credit terms follow the schedule of the Arrangement on Export Credits of the Organization of Economic Cooperation and Development. ^{1/} To be eligible for this financing, products must be included on Fomex's list of eligible items and have a minimum of 30 percent local content. The exporter must have commercial risk insurance but need not be a majority Mexican-owned company unless it is an advertising company or an in-bond company.

For preexport and import substitution financing, the minimum rate of interest is 50 percent of CPP for credit issued after September 30, 1984. Fomex plans to move the rate progressively closer to CPP. ^{2/} If a company's products have 50 percent or more local content, 100 percent of the cost of production and 70 percent of the invoice value of production-related imports can be financed. If, in this case, the company's export program is registered with IMCE, 85 percent of the cost of imports can be financed. If local content is between 30 and 50 percent, preexport financing will support 100 percent of Mexican content or double that amount if the company's export program is registered with IMCE. All production financing is available only to firms with 51-percent Mexican capital, but in-bond firms must be 100 percent Mexican owned.

The percentage of manufactured exports assisted by Fomex has varied over the past 5 years (table 69). Financing dipped to a level of 25 percent of these exports in 1983. This was down significantly from a level of assistance equal to 42 percent of manufactured exports in 1981.

^{1/} These rates vary from 9.5 percent to 12.15 percent, depending on the level of economic development of the recipient and on the length of maturity of the loan. However, if competitors offer rates lower than these, Mexico is prepared to match such rates.

^{2/} Before Sept. 30, 1984, the interest rate was 35 percent of CPP. A further upward adjustment in the rate is expected in 1985.

Table 69.--Mexico: Fomex financial support to export sales, 1979-83

Item	1979	1980	1981	1982	1983
Total value of Mexican exports					
million of U.S. dollars--	8,818	15,307	19,420	21,230	21,399
Value of manufactured exports-----do-----	2,934	3383	3427	3386	4519
Percentage of total exports-percent--	33.3	22.1	17.6	16.0	21.1
Exports aided by Fomex sales finance					
million of U.S. dollars--	769.1	1034.7	1442.4	1347.7	1148.8
Percentage of manufactured exports					
percent--	26.2	30.6	42.1	39.8	25.4

In 1983, certain industries stood out in the Fomex loan portfolio. As shown in table 70, chemicals was the leading recipient of export sales financing, receiving 25 percent. Metal and mineral products were the second highest recipients with about 17 percent and about 14 percent, respectively, of export financing. The chemicals, canned goods and tobacco, and wood products industries together accounted for over 10 percent of Fomex preexport financing.

In affirmative determinations resulting from countervailing duty investigations of imports from Mexico to the United States, the U.S. Department of Commerce found Fomex financing among the countervailable subsidies in certain cases. For example, determination of bounties or grants related to Fomex amounted to 0.70 percent ad valorem for carbon black, 1.52 percent for unprocessed float glass, and 1.85 percent for bricks.

Science and Technology

Scientific and technological advancement in Mexico is promoted by the Government via two principal mechanisms. One is support of research and development (R&D) and the other is regulation of technology transfer. Both of these are described below.

Research and development

Support for most R&D activity in Mexico comes from the Government. According to estimates, the Mexican Government sponsors about 90 percent of all R&D expenditures. ^{1/} Of the remaining 10 percent of total expenditure, 4 percent comes from the Mexican private sector and 6 percent from foreign firms doing business in Mexico.

^{1/} Consejo Nacional de Ciencia y Tecnologia

Table 70.--Mexico: Fomex preexport and export sales financing
by product categories, 1983

(in millions of pesos)					
Product	Pre export		Export		
	Amount	Percent	Amount	Percent	
		of total		of total	
	<u>Million</u>		<u>Million</u>		
	<u>pesos</u>		<u>pesos</u>		
Meat products-----	793.1	1.3	260.6	0.2	
Vegetable products-----	5,303.8	8.9	2,892.3	1.8	
Fats and oils-----	-	-	.7	-	
Canned goods, tobacco-----	6,442.8	10.8	14,201.1	8.6	
Minerals-----	2,404.4	4.0	23,609.3	14.3	
Chemicals-----	6,770.9	11.3	41,944.4	25.4	
Rubber and plastics-----	1,948.3	3.3	6,840.1	4.2	
Leather products-----	376.4	.6	249.1	0.2	
Wood products-----	6,651.3	11.1	1,913.1	1.2	
Paper products-----	1,685.4	2.8	2,052.7	1.2	
Textiles-----	3,577.1	6.0	6,744.4	4.1	
Other textiles-----	1,617.9	2.7	685.6	.4	
Glass products-----	5,679.7	9.5	9,276.9	5.6	
Precious stones-----	209.6	.4	102.2	.1	
Metals-----	5,097.3	8.5	29,221.9	17.7	
Electrical machinery-----	3,954.9	6.6	11,065.7	6.7	
Transport machinery-----	1,860.2	3.1	6,059.2	3.7	
Precision instruments-----	384.0	.6	2,672.2	1.6	
Arms and munitions-----	106.1	.2	73.7	-	
Other products-----	2,199.5	3.7	2,816.3	1.7	
Art objects-----	.2	-	3.0	-	
Services-----	1,286.4	2.2	2,302.2	1.4	
Share of consortium-----	1,553.4	2.6			
Total-----	59,902.8	100.0	164,983.7	100.0	

Source: Fomex Memoria: 20th Anniversary 1962-82.

The National Council of Science and Technology (CONACYT) coordinates scientific and technological activities and establishes national technological standards. CONACYT prepares the National Program for Science and Technology which sets the national research agenda. The latest program outlines research priorities in such areas as agriculture and hydraulic resources, commerce, communications and transport, urban development and housing, public education, energy and minerals, fisheries, and public health. The need for industry-specific R&D in agroindustry, pharmaceutical raw materials, petrochemicals, metal mechanics, and construction is also emphasized.

A number of financial and tax incentives to encourage R&D are provided by the Government through both general programs and industry-specific decrees.

The 1984 pharmaceutical decree is a recent example of industry-specific research and development efforts. The decree offers financial and tax incentives for scientific and technological research to domestically owned companies investing in the production of pharmaceutical raw materials. 1/

Financial assistance. 2/--Two government trust funds, the National Fund for Industrial Development (Fonei) and the National Fund for Preinvestment Studies and Projects (Fonep), are particularly important to R&D efforts. Fonei provides financing at favorable rates for preinvestment studies and for modernizing the production technologies of Mexican firms. A large portion of funding under the various Fonei programs finances projects in the metal machinery and equipment industry. Fonep exclusively finances preinvestment studies. Almost two-thirds of Fonep disbursements in 1983 went to industry and nearly one-third went to the services sector.

Tax incentives.--Corporate expenditures for research and development receive a variety of tax advantages. Such expenditures are tax deductible and straight-line depreciation on research and development equipment is 35 percent per annum. Also, tax credits of up to 15 percent can be obtained by research institutions under a 1980 program. Another tax measure, implemented in 1981, allows tax deductions of up to 1 percent of annual gross income for payments into bank-administered trust funds for technological research and development.

Technology transfer

Technology transfer in Mexico is accompanied by rigorous governmental oversight. This regulation is achieved through control of technology acquisition contracts and approval of foreign-investment proposals.

The Law of Control of Transfers of Rights of Technology, effective February 1973 and modified in January 1982, requires all contracts involving technology transfer to be registered with the National Register of Transfers of Technology. The Government then scrutinizes the terms of the contracts. The aim is to ensure that Mexican companies have fair access to advanced technology at a minimum cost. Royalties for rights to technology are not expected to exceed 3 percent of gross income per year, but the Government may approve higher charges in special cases. Rejection of contracts has usually resulted from determination that excessive fees or time periods were required. Tax deductions are permitted for royalties paid under technology transfer contracts approved by the National Registry.

The greatest number of foreign technology transfer contracts has been in priority industrial activities. For example, as shown in table 71, intermediate goods and manufacturing industries each received over 20 percent of all contracts approved during 1973-81. Foreign technology contracts were markedly prevalent in the capital-goods sector, but were less substantial in strategic and mining industries where foreign participation is limited. 3/

1/ This and other decrees are detailed in the section on targeting practices for specific industries.

2/ Additional description and data on these financing programs appears in the sector on the financial system.

3/ Cement and steel are considered strategic industrial products.

Table 71.--Mexico: Distribution of technology transfer contracts, by economic activities, 1973-81

Industrial activity	Origin of technology contracts				Total number of contracts	Percent of total
	Mexican		Foreign			
	Number	Percent of total	Number	Percent of total		
Agriculture-----	154	7.0	343	5.2	497	5.0
Capital goods-----	171	7.7	1,159	17.4	1,330	13.5
Strategic investment--	72	3.3	77	1.2	149	1.5
Durable goods-----	136	6.2	897	13.5	1,033	10.5
Nondurable goods-----	228	10.3	717	10.8	945	9.6
Intermediate goods---	531	24.0	1,005	15.1	2,536	25.7
Manufacturing-----	607	27.5	1,418	21.3	2,025	20.5
Mining-----	86	3.9	84	1.3	170	1.7
Services, trade-----	223	10.1	955	14.4	1,178	11.9
Total, as of						
Dec. 31, 1981--	2,208	100.0	6,655	100.0	9,863	100.0

Source: Director General for Foreign Investment and Transfer Technology, Mexican Secretariat of Commerce and Industrial Development.

Technology transfer is also achieved through regulation of foreign investment. The degree a project contributes to the technological development of an industry influences the Government's decision on whether to grant exceptions to the rules requiring Mexican majority ownership. In February 1984, restrictions on foreign majority control were relaxed in 34 industrial activities, largely because of the technological gains these industries could be expected to acquire.

One inhibition to technology transfer, as well as domestic R&D efforts, is Mexico's limited patent and trademark legislation. Foreign patents and trademarks are not recognized unless registered in Mexico. The life of a patent is 5 years, renewable for additional 5-year periods indefinitely, but the Government can reassign the right to exploit a patent that is not exploited within 3 years after registration. Moreover, the Law on Inventions and Trademarks prohibits patent protection on products such as alloys, chemicals, pharmaceuticals, pesticides, herbicides, and fungicides. Processes for manufacturing the above products as well as antipollution, nuclear energy, and safety inventions and processes are also unpatentable. Though all of the foregoing may obtain certificates of invention, this does not confer the exclusive right of exploitation.

Cartel and Merger Policy

Anticartel legislation

Mexico maintains anticartel legislation applicable to the private sector. A 1934 law and subsequent statutes prohibit cooperative agreements or other price-fixing practices between businesses. Regulations are particularly stringent for private industries making products the Government considers basic necessities. Anticartel laws have not been invoked often, however. Most cases have been brought against attempts to withhold goods from the market to raise prices. ^{1/}

With lax enforcement of this legislation, a number of private sector conglomerates have emerged; their increase in number and size was particularly rapid during the oil boom of 1979-81. The participation of some of these conglomerates in the industrial structure is extensive. For example, Mexico's largest private conglomerate, the Alfa group, has bought interests in industries ranging from food processing, steel, and electronics to petrochemicals. Voicing concern about this problem, President de la Madrid has said that "monopolistic practices must be regulated adequately" and that he would fight "concentration not justified for reasons of technology or national efficiency." ^{2/}

Another major inhibition to industrial competition in Mexico is extensive Government-ownership and regulation of enterprises. The State has a monopoly in certain industries--the extraction, refining, and retailing of petroleum, for example. In key private industries, such as automobiles and pharmaceuticals, detailed Government regulations can have some effects on industry similar to that of cartels.

To counterbalance the economic impact of public and private sector industrial concentration, Mexico has assisted small and intermediate business and controlled prices, in lieu of enforcement of anticartel laws. These mechanisms are described below.

Small and medium enterprise incentives

To offset gains by conglomerates, the Government provides tax breaks and financial incentives for small and intermediate businesses. ^{3/} Fogain is among the largest Government trust funds and serves these enterprises exclusively. Also, CEPROFI tax credits to small and medium firms meeting its other regional and industrial criteria are granted at a rate higher than that offered to large firms. ^{4/}

^{1/} Price Waterhouse, Doing Business in Mexico, 1984 p. 35.

^{2/} U.S.-Mexico Chamber of Commerce, The Washington Letter, July 1982, p. 2.

^{3/} Small enterprise is defined as firms for which the value of fixed assets does not exceed 200 times the annual minimum wage in the Federal District.

^{4/} Each of these programs is discussed earlier in sections on tax policy and the financial sector.

Price controls

The Mexican Government influences prices by applying price controls to certain categories of products sold by both the private and public sectors and by setting the prices of other goods and services sold by public agencies and Government-owned enterprises. Reducing the impact of private conglomerates is only one goal of this price regulation. Other goals include fighting inflation, providing the poor with low-priced essential consumer goods, and lowering the cost to industry of raw materials and utilities. In accordance with the IMF economic adjustment program, the current Administration has eased price controls and raised charges for government services and products to encourage more efficient allocation of resources.

Mexican public pricing policy is currently formulated by a Commission for Public Sector Prices and Tariffs. The commission sets rigid prices on selected food products and medicines. Other items, including industrial raw materials, are assigned variable prices that may be raised when a firm can establish that costs have escalated by more than 5 percent.

The real impact of price controls on inflationary pressures is questionable. In some years, shown in table 72, average price increases on controlled products were greater than increases in the prices of noncontrolled products. This occurred in both 1980 and 1982 but most markedly in January-June 1984 when controlled prices rose by nearly 39 percent, but uncontrolled prices rose only about 28 percent. Over all of 1983, average price increases of 74 percent on controlled products were below the nearly 83 percent price rise for unregulated products. The 1983 and 1984 trends in average controlled product prices probably reflect the price increases authorized on some controlled products by the de la Madrid administration.

Table 72.--Mexico: Relation of controlled prices to the overall rate of inflation, 1979-83 ^{1/}

(In percent)								
	: Parti-	: 1979	: 1980	: 1981	: 1982	: 1983	: January- June--	
	: cipation:						1983	1984
	:	:	:	:	:	:	:	:
Total inflation----	100.0	20.0	29.8	28.7	98.8	80.8	41.0	30.4
Controlled products:	23.2	18.0	30.9	20.7	104.5	74.0	25.7	38.9
Other products----	76.8	20.6	29.5	31.1	97.1	82.8	45.6	27.8
	:	:	:	:	:	:	:	:

^{1/} The figures are based on controlled prices of a basket of food items and utilities.

Source: Centro de Estudios Economicos del Sector Privado

Price controls tend to favor certain industrial activities. Low utility prices subsidize the costs of production for all industries, but those that are highly energy intensive, such as the metal industries, naturally benefit more. 1/ Controlled prices of raw agricultural products aid the food processing industries and cheap basic petrochemical products benefit the secondary petrochemicals industry. Unreasonably low prices and distorted prices caused by the controls are, however, suspected of contributing to the acknowledged inefficiency of Mexican domestic producers.

Recently, price increases and decontrol on some controlled products and the elimination of controls on other products have resulted in a lower degree of price subsidy than existed previously. Although price controls on a number of products were eliminated in December 1982, variable price controls are still in effect on many basic items such as primary petrochemicals, certain chemical products, steel, cellulose, fertilizers and automobiles. 2/ Official price controls are now maintained on only about 150 types of products.

Targeting Techniques in Specific Mexican Industries

Automobile Industry

Through a series of Government decrees, Mexico has attempted to generate a positive automotive trade balance by increasing the domestic content of cars, encouraging import substitution, and boosting exports. Since publication of the first automotive decree in 1962, the auto industry has remained an important industrial priority. In 1979, the auto industry was listed in the National Industrial Development Plan as an industry with potential for contributing to the Mexican priority of raising export revenue. Heavy protection from import competition has complemented Government policy aims and incentives for the automotive industry. Imports of finished automobiles were banned in 1965. However, a notable feature of Mexico's automotive industry is that most auto assembly operations are foreign-owned.

Companies that meet the automotive decree requirements are eligible for a wide range of incentives. These incentives include tax rebates, investment grants for automotive part plants and duty exemptions on imports of machinery, equipment, raw materials, and components not produced in Mexico. In 1979, the industry reportedly received more than 50 percent of all of the direct industrial subsidies given by the Mexican Government. 3/ Meanwhile, high

1/ Subsidized energy prices are among the major unresolved issues in U.S.-Mexican negotiations aiming at a bilateral agreement on Mexican subsidization and U.S. countervailing.

2/ Some key end products, such as household appliances, trucks, buses, tractors, soap, and paper are also under variable controls, and selected food items and medicines are still under rigid controls. Remaining price controls indirectly shape prices of other commodities by forward and backward linkages.

3/ Statement of Jesus Silva-Herzog Flores, undersecretary of finance and public credit, Jan. 28, 1980, as reported in Mercado del Valores, Feb. 4, 1980, pp. 97-98.

levels of import protection reserved the domestic market for autos produced in Mexico. In spite of this combination of incentives, the industry has not met the Mexican Government's expectations.

Although the output of the industry increased 40 percent from 1979 to 1981, as shown in Table 73 below, other policy objectives of the decrees, including import substitution and domestic content levels, were not fully attained. For example, instead of contributing to import substitution, the automotive industry was responsible for nearly 60 percent of the entire Mexican trade deficit in 1981. ^{1/} These imports of inputs for the industry reflected inadequate implementation of requirements to use domestic parts in auto production and the inability of the Mexican autopart industry to fully supply industry demand.

Table 73.--Mexico: Indexes of industrial production in the automotive sector, 1979-83

(1970=100)	
Year	Automobiles and trucks
1979-----	263.0
1980-----	300.3
1981-----	368.2
1982-----	269.9
1983 ^{1/} -----	160.2

^{1/} Preliminary.

Source: Banco de Mexico and Asociacion Mexicana de la Industria Automotriz.

Recognizing these shortcomings in the implementation of earlier decrees, the de la Madrid Administration issued a new automotive decree in September 1983, which provided for restructuring the industry. In August 1984, the regulations implementing the new decree were published. The new decree strengthened some provisions of earlier decrees and demonstrated new resolve to implement these provisions.

For the automotive assembly industry, the new decree strengthens domestic content and Mexican ownership requirements. The decree projects the raising of domestic content requirements above the 50-percent level specified in earlier decrees. The decree calls for domestic content levels of 60 percent for automobiles, and 70 percent for vans and light trucks by 1987. Under certain conditions, however, automobile lines destined primarily for export can gain exceptions to these domestic content requirements. In promoting expansion of the truck assembly industry, currently dominated by the Government-owned Deisel Nacional, the Government has granted Mexican-owned companies the exclusive right to assemble trucks and produce diesel engines.

The automotive decree also contains provisions to promote the national development of the autoparts-manufacturing industry. Autopart manufacturers are scheduled to be at least 60-percent Mexican-owned. ^{2/}

^{1/} Business Latin America, Sep. 28, 1983.

^{2/} Ibid.

At the same time, auto parts producers are expected to acquire 80 percent of their overall input requirements from domestic sources by 1987. Each separate input line also must have at least 60 percent Mexican content by that date.

To achieve efficiency through economies of scale, the decree calls for a drastic reduction in the number of basic lines and limits the number of models per line that carmakers may manufacture. Exceptions are made if more than 50 percent of the production of that model is exported.

The decree does allow the Government some discretion in allocating incentives to particular firms. Negotiations are conducted between individual automakers and the Mexican Government on the applicability of the decree to their particular case, and the Government may waive certain requirements if the company will help support other economic goals, such as increasing national foreign exchange earnings through automotive exports. For example, the Secretariat of Commerce and Industry (Secofin) negotiates a foreign currency allotment separately for each company based on export revenue, direct investment, and financing from abroad. Secofin must also establish maximum volumes of production for each assembly plant and adjust these levels every quarter, taking the above factors into consideration.

Computer and electronics industry

In September 1981, the Mexican Government adopted an ambitious plan to establish a domestic computer industry and to reach 70-percent self-sufficiency by 1985. Though the Government is currently considering a revised and more restrictive plan for the computer and electronics sector, the highly controversial proposed plan is not considered close to adoption. The main goal of regulation of this industry is to promote import substitution to offset high import levels of computers, peripherals, and software. Such imports amounted to \$141.8 million in 1983. Although imports fell by almost 38 percent to \$88.5 million in 1983, they still accounted for 70 percent of national consumption of these products.

Since demand is expected to remain strong, the 1981 plan applies fiscal incentives and import and investment restrictions to achieve the goal of limiting imports. Incentives granted to Mexican and foreign manufacturers of computer and electronic equipment include tax credits for purchases and investments, duty reductions for the import of components and export incentives.

To implement the plan, agreements are negotiated with foreign manufacturers of computer systems and related equipment which require them to use a certain ratio of Mexican-made components in production and to gradually decrease the ratio of imports to domestic production. These imports are controlled by licensing and selective Government procurement. However, a greater number of import permits for computers and related equipment were allowed in 1984, and tariffs on these types of items are being lowered.

Implementation of the plan has progressed more slowly than originally slated. The de la Madrid administration has altered the earlier emphasis on developing sufficient domestic capacity to meet domestic demand to one of balancing computer industry imports and exports. Some Mexican computer makers

are reportedly gearing up to capture some of the Latin American market to meet the requirement that they balance imports with exports. ^{1/}

Despite various restrictions, foreign companies continue to be drawn to Mexico's growing market for computers, which is expected to reach about \$262 million in 1987. Manufacturers of mainframes and minicomputers can obtain authorization for 100-percent ownership if they used a high proportion of Mexican-made components. However, as part of the drive for Mexicanization, the plan bars foreign majority ownership of companies making small business and personal computers.

Petroleum and natural gas

The petroleum industry in Mexico is wholly Government owned through the Government oil company, Petroleos Mexicanos (Pemex). Like other mineral deposits and natural resources, petroleum is considered a national resource whose extraction, development, and allocation should accord with domestic requirements and the national interest.

In Mexico, the world's fourth largest producer and exporter of crude oil, the petroleum sector dominates the economy both as an earner of foreign exchange and as a user of capital goods, materials, and services. Petroleum now accounts for about three-fourths of the country's total merchandise exports (see table 74). The industry contributes to about 5 percent of Mexico's GDP. ^{2/} Furthermore, the revenues Pemex earns and the taxes it pays

Table 74.--Mexico: Total exports and exports of crude oil, 1975-82

Year	Total exports	Exports of crude oil	
		Value	Percent of total
	Billion pesos	Billion pesos	
1975-----	36.30	5.44	15.0
1976-----	53.52	8.40	15.7
1977-----	102.05	22.31	21.9
1978-----	135.65	40.66	30.0
1979-----	204.86	86.43	42.2
1980-----	357.52	214.43	60.0
1981-----	474.34	325.54	68.6
1982-----	^{1/} 1,231.83	^{1/} 912.53	^{1/} 74.1

^{1/} Values are annualized data based on actual exports during January-September 1982. The crude oil share is based on data for January-September.

Source: Compiled from data published by the IMF in International Financial Statistics.

^{1/} Businessweek, Nov. 14, 1983. p. 64

^{2/} Commerce Department, International Marketing Information Series, Foreign Economic Trends and Implications for the United States; Mexico, March, 1984, p. 6.

are an important source of income for the Government, particularly for repayment of Mexico's extensive foreign debt obligations. The total of all taxes collected on activities by Pemex neared 30 percent of total Government tax revenue in 1982, up from only about 10 percent in 1979. The increase was largely due to higher taxes on exports of crude oil.

Output by the industry has increased substantially in recent years. According to Banco de Mexico and Pemex, output growth during 1979-83 has been concentrated in the petroleum and natural gas and petrochemicals sector of the industry as shown in the tabulation below (1970=100):

<u>Year</u>	<u>Petroleum and natural gas</u>	<u>Petroleum refining</u>	<u>Basic petrochemicals</u>
1979-----	287.8	196.8	297.2
1980-----	381.8	221.6	325.3
1981-----	453.3	249.3	379.3
1982-----	519.2	239.4	426.7
1983 <u>1/</u> -----	511.9	230.0	540.0

1/ Preliminary.

The Mexican Government operates PEMEX, the country's petroleum and gas monopoly. PEMEX was formed in 1938 when the Government expropriated foreign oil holdings and nationalized the industry. At the time, the industry was largely a crude oil export operation. In the late forties, PEMEX began to seek the development of an integrated petroleum industry. However, it wasn't until 1977, after major oil reserves were found, that PEMEX became a major force in the economy and undertook an ambitious program to realize this goal.

In its investment program for 1977-82, PEMEX set ambitious targets for oil exploration, oil and gas pipeline construction, new refining facilities, and plants for basic petrochemicals. The Portillo Administration hoped that PEMEX revenues would underwrite industrial promotion plans for both the oil and the non-oil sectors of the economy. However, because of depressed world petroleum prices and other factors, Pemex has been unable to pay for even its own investment plan. As a result, the borrowing requirements of Pemex contributed significantly to the debt crisis of 1982. The current Administration has emphasized the maintenance of productive capacity rather than expansion.

Because of its influence on the Mexican economy, Pemex plays an important role in helping to develop other industries. For example, Tubos de Acero de Mexico (TAMSA), a large privately-owned Mexican steel maker, depends on Pemex purchases of more than 80 percent of the seamless steel pipe it produces.

Pharmaceuticals industry

Pharmaceuticals is one of the industries classified in development plans as an industry of strategic importance. Adequate domestic supplies of basic medicines is considered critical to maintenance of public health standards. The importance of a domestic supply of basic medicines was reconfirmed when, for example, stringent import controls imposed after the 1982 debt crisis caused a national shortage of penicillin.

The pharmaceutical industry is currently dominated by about 75 foreign companies. Foreign companies reportedly supply 72 percent of the domestic drug market. 1/ Private sector representatives of foreign firms in Mexico estimate that about 50 percent of all drug purchases are made through Government procurement to supply hospitals and clinics. These officials claim that they sell substantial quantities of pharmaceuticals to the Government through a bidding process: they supply close to 50 percent of the Government-controlled market. According to the National Industrial Development Plan, however, Mexico hopes to produce 60 percent of the active ingredients it needs by 1988. 2/

All pharmaceuticals are subject to rigid price controls. Prices are structured, however, so that those for the private market are highest, those under Government procurement follow, and those of generic drugs are expected to be lowest so that they are affordable to the many low-income Mexicans. Prices in the first two markets, particularly in the private market, generally allow for reasonable margins of profit.

In February 1984, the Mexican Government issued a decree regulating the pharmaceutical industry. In October 1984, regulations implementing the decree were issued. The Government has used these regulatory procedures to stave off domestic political pressures calling for nationalization of the pharmaceutical industry. The decree is expected to make Mexico more self-sufficient in pharmaceutical production (particularly production of active ingredients) and to increase the role of domestic pharmaceutical laboratories in the Mexican industry. 3/ Another objective of the decree is to increase the supply of low-cost drugs. The decree also mandates generic labeling of basic retail drugs, calls for uniform prices of generic drugs, and sets stringent price controls on a group of essential medicines. 4/

The pharmaceutical decree applies several industrial targeting instruments, which tend to favor domestically owned companies. The decree protects the home market from pharmaceutical imports and gives support to Mexican laboratories. More than 60 active ingredients are singled out for priority development with the objective of replacing part of imports with domestic supplies. Domestic laboratories will be given preferential financing, research and development funds, tax and other economic incentives.

1/ Business Week, April 30, 1984.

2/ Ibid.

3/ Price Waterhouse, Doing Business in Mexico, 1984, p.35.

4/ Ibid.

For example, a new interministerial commission for the industry has been directed to encourage Government credit agencies to finance more Mexican-owned pharmaceutical firms. Also, the national laboratories are to be favored in Government procurement of basic drugs.

The Government has tried to assure concerned foreign governments that multinational companies will not be unduly discriminated against in implementation of these measures. As evidence of this commitment, the Government pointed out, for example, that many Government-procured drugs will not be available for some time from Mexican firms, thus substantial purchases will still be made from multinational drug companies.

The decree places a variety of requirements on all drug companies. Drug companies must now purchase at least 20 percent of their raw materials from domestic sources and elevate this level to 50 percent within 3 to 5 years. The companies are also urged to export a substantial share of their production and make a net contribution to the balance of payments. ^{1/} According to Mexican Government estimates, imports by drug companies reached \$300 million annually the last 2 years, but annual exports amounted to only \$100 million. The Government hopes to encourage a better balance of this trade. Another requirement of the decree directs firms to invest an amount equal to 4 percent of feedstock sales in research and development each year.

Pharmaceutical producers in Mexico have been adversely affected since 1975 by a law on inventions and trademarks. Foreign producers are affected most heavily because they possess greater amounts of funds than Mexican producers to invest in independent research and development. This law prohibits certain chemical products, including pharmaceuticals, from being patented in Mexico. In the case of pharmaceuticals, neither product patents nor process patents are recognized by the Mexican Government. The patent law also requires that all products fabricated in Mexico should be labeled with a distinct Mexican trademark. ^{2/}

Steel Industry

The Mexican Government is deeply involved in the production and marketing of steel and has devoted substantial resources to increasing steel production. Mexican steel prices have been controlled since 1956. Three of the "big five" Mexican steelmakers are wholly owned by the Government. They are: Altos Hornos de Mexico (AHMSA), which is currently the largest, Fundidora de Monterrey, and Siderurgica Lazaro Cardenas-Las Truchas (Sicartsa). All three are integrated steel companies. Sicartsa, the newest, was founded in 1977 and is expected eventually to become the largest. Some of the companies in the Sicartsa complex are joint ventures between Mexican Government entities and Japanese companies.

The steel industry was assigned priority in the 1979 National Industrial Development Plan. Steel is one of the few products that the Government classifies as a "strategic material." Under the Portillo administration, a complete reorganization of the state-owned steel sector was instituted. Siderurgica Mexicana (Sidermex), a Government entity, was established to

^{1/} Business Week, Apr. 30, 1984.

^{2/} Unclassified State Department telegram, April, 1984.

coordinate the management and marketing activities of the state-owned steel companies. Sidermex is the second largest industrial conglomerate in Mexico after Pemex. In 1980, Government-run operations accounted for 57 percent of all Mexican steel production. Foreign interests represented less than 3 percent of the total. 1/

Despite the debt crisis and foreign exchange shortage, the capacity of the steel industry continued to expand, although at a slower pace. Completion of phase II of the four-phase Sicartsa expansion will be delayed well past 1984, its scheduled completion date.

Private steelmakers have benefitted from a wide range of development incentives. In its countervailing duty investigations, the U.S. Department of Commerce found that private steelmakers in Mexico benefitted directly from financial incentives such as Fomex, Fonei, and tax incentives such as Ceprofi. Addressing the general issue of indirect benefits resulting from Government control of Mexican iron and steel production, however, the Commerce Department determined in one investigation that state assistance and benefits to steel producers do not automatically constitute a subsidy to steel-product manufacturers. It based this determination on the argument that "benefits bestowed on the manufacturer of an input are not passed on to a purchaser if the sales are transacted at 'arms length,'" that the seller "does not pass forward any benefits to an unrelated purchaser." 2/

1/ Business Mexico, op. cit. p. 288.

2/ Final Affirmative Countervailing Duty Determination and Countervailing Duty order; Certain Iron-Metal Construction Castings from Mexico., Federal Register, Vol. 48, No. 42, p. 8836.

TAIWAN'S INDUSTRIAL POLICY AND TARGETING

Introduction

The Taiwan authorities have consistently attempted to increase the competitiveness of domestic industries by using selective industrial policy tools. Following is a brief overview of the changes in Taiwan's economy and industrialization strategies in the postwar period, along with a discussion on specific targeting techniques and case studies of how they have been applied to different industries.

Historical Overview 1/

The economic record

Taiwan's economic growth record is one of the most impressive in the developing world. High and consistent growth in real income, output, and trade was achieved, while maintaining full employment, stable prices, and a relatively even income distribution.

Taiwan's economy has continued to perform well in recent years, both generally and relative to other developing countries. Real GNP grew an estimated 7 percent in 1983, following an increase of nearly 4 percent in 1982 and 5 percent in 1981. At the same time, inflation has been low--under 2 percent in 1983 and less than 6 percent in 1982.

Taiwan's economic structure shifted dramatically from 1961 to 1981. In 1961, agriculture accounted for 27.6 percent of GDP, industry, 29.5 percent, and services 42.9 percent. By 1981, industry accounted for more than half (50.4 percent) of Taiwan's GDP, agriculture's share had dropped to 7.4 percent, and services accounted for the remaining 42.1 percent. 2/

The structure of industrial output also changed significantly. Light industry's share of industrial production steadily declined after 1960, while the importance of other industries--notably machinery, electronics, and chemicals--increased. By 1980, Taiwan was the third largest chemicals

1/ This section is based primarily on the following: Tzong-shian Yu, "Strategies and Policies for Economic Development in Taiwan," Industry of Free China, June 1979; K.T. Li and W. A. Yeh, "Economic Planning in the Republic of China," Industry of Free China, February 1982; Shirley W. Y. Kuo, The Taiwan Economy in Transition, Boulder, Colorado: Westview Press, 1983; Walter Galenson (ed.), Economic Growth and Structural Change in Taiwan: The Postwar Experience of the Republic of China, Ithaca: Cornell University Press, 1979; Mo-Huan Hsing, Taiwan: Industrialization and Trade Policies, London: Oxford University Press for the Organization of Economic Cooperation and Development, 1971; Roy Hofheinz, Jr. and Kent E. Calder, The East Asia Edge, New York: Basic Books, 1982 and, Shirley W. Y. Kuo, Gustav Ranis, and John C. H. Fei, The Taiwan Success Story, Boulder, Colorado: Westview Press, 1979; Council for Economic Planning and Development, Republic of China, "Economic Development in Taiwan, Republic of China," 1984; Ministry of Economic Affairs of the Republic of China, "Development of Industries in Taiwan, Republic of China," June 1984, Anton Galli, Taiwan: Economic Facts and Trends, Institut fur Wirtschaftsforschungmunchen, London: Weltforum Verlag, 1980, p. XV..

2/ Council for Economic Planning and Development, "Economic Development Taiwan Republic of China," May 1982.

producer in Asia (after Japan and China) and was a major producer of electronics, textiles, machinery, and metal products. Electrical machinery accounted for 19.54 percent of the value added in manufacturing in 1982; textiles was the second most important industry, accounting for 17.38 percent (see table 75).

Table 75.--Taiwan: Value-added in manufacturing,
by specified industries, 1982

Industry	Amount	Share of value added in manufacturing
	Million NT\$	Percent
Food-----	103,477	4.89
Beverages and tobacco-----	63,280	1.83
Textiles-----	222,533	17.38
Wearing apparel-----	70,323	3.56
Leather-----	7,040	.90
Lumber and furniture-----	31,511	3.06
Paper and printing-----	51,391	2.64
Chemical materials-----	141,768	8.40
Chemical products-----	36,376	2.29
Refined petroleum and coal products-----	178,939	5.59
Rubber products-----	24,471	1.76
Plastic products-----	106,276	5.55
Nonmetallic minerals-----	49,643	3.25
Basic metal-----	98,258	4.67
Metal products-----	9,874	1.24
Machinery-----	34,154	2.83
Electrical machinery-----	195,786	19.54
Transportation equipment-----	101,441	6.33
Precision instruments-----	6,319	0.86
Miscellaneous manufactures-----	18,635	3.43
Total manufacturing-----	1,553,493	100.00

Source: Ministry of Economic Affairs as cited in Industry of Free China, Taiwan Economic Statistics, June 1983, pp. 122-125 and Ministry of Economic Affairs, Taiwan Industrial Production Statistics Monthly, April 1984, p. 55.

The share of public enterprises in industrial production has steadily diminished since 1952, when former Japanese firms were taken over by the State. At that time, the contribution of Government-run firms' to industrial production was 57 percent, ^{1/} but by 1982, public enterprises accounted for 19 percent of value added in industrial production in Taiwan. In addition to providing utilities and transportation services, the Taiwan authorities also directly produce many basic manufactures and raw materials. ^{2/}

^{1/} Anton Galli, Taiwan: Economic Facts and Trends, Institut für Wirtschaftsforschung München, London: Weltforum Verlag, 1980, p. XV.

^{2/} In 1983, public enterprises accounted for 18 percent of the value of miscellaneous mining and quarrying products produced in Taiwan, 27 percent of the food products, 80 percent of the beverages and tobacco, 20 percent of the chemical materials, 26 percent of the petroleum and coal products, 48 percent of the basic metals, 4 percent of the metal products, 9 percent of the machinery, 16 percent of the transport equipment, and nearly 100 percent of the electricity, gas and water. Ministry of Economic Affairs, Taiwan Industrial Production Statistics Monthly, April 1984, p. 52-54.

Small- and medium-sized firms play a significant role in Taiwan's manufacturing sector. Nearly 99 percent of the total number of manufacturing firms in Taiwan (91,086) were considered small- and medium-sized businesses in 1980 (table 76). Not surprisingly, large firms play a major role in Taiwan's most internationally competitive industries--electronics, textiles, footwear, petrochemicals, and plastics.

Table 76.--Taiwan: Distribution of firm size in Taiwan's manufacturing sector, by value of production, 1981

Industry	: Small- and medium- :		Large :		Total
	: <u>sized businesses 1/</u> :		: <u>Businesses 2/</u> :		
	: Number of :		: Share of:		
	: <u>firms</u> :		: <u>total</u> :		
		: <u>Percent</u> :		: <u>Percent</u> :	
		:		:	
Manufacturing-----	90,126 :	98.9 :	960 :	1.1 :	91,086
Food-----	8,557 :	99.5 :	42 :	.5 :	8,500
Beverage and tobacco--	139 :	97.8 :	3 :	2.2 :	142
Textile-----	5,749 :	96.9 :	174 :	3.1 :	5,653
Wearing apparel-----	3,352 :	97.8 :	72 :	2.2 :	3,424
Leather-----	918 :	95.5 :	43 :	4.5 :	961
Lumber and furniture--	8,572 :	99.5 :	40 :	.5 :	8,612
Paper and printing----	6,384 :	99.6 :	26 :	.4 :	6,410
Chemical materials----	1,000 :	99.5 :	36 :	.5 :	1,036
Chemical products-----	1,766 :	99.2 :	14 :	.8 :	1,780
Petroleum and coal	:	:	:	:	
products-----	75 :	96.2 :	3 :	3.8 :	78
Rubber products-----	1,130 :	97.3 :	31 :	2.7 :	1,161
Plastic products-----	6,823 :	98.7 :	93 :	1.3 :	6,916
Non-metallic mineral	:	:	:	:	
products-----	3,716 :	99.2 :	31 :	.8 :	3,747
Basic metal-----	2,542 :	99.1 :	24 :	.9 :	2,566
Metal products-----	19,311 :	99.9 :	22 :	.1 :	19,333
Machinery-----	7,634 :	99.6 :	34 :	.4 :	7,668
Electrical machinery	:	:	:	:	
and appliances-----	4,625 :	96.4 :	172 :	3.6 :	4,797
Transport equipment---	2,702 :	98.8 :	32 :	1.2 :	2,734
Precision instrument--	704 :	98.7 :	9 :	1.3 :	713
Miscellaneous	:	:	:	:	
manufactures-----	4,697 :	98.8 :	59 :	1.2 :	4,756
	:	:	:	:	

1/ Employing from 1 to 299 persons.

2/ Employing over 300 persons.

Source: Directorate-General of Budgets, Accounting and Statistics, Executive Yuan, 1982.

Trade has been critical to Taiwan's economic growth, making an increasing contribution to national income and output over the course of the past two decades. Manufactured goods have accounted for a growing portion of exports during the period. In 1971, agriculture accounted for 8 percent of Taiwan's exports, processed agricultural products 11 percent, and industrial products

81 percent; but by 1981, agriculture's share had dropped to 2 percent, processed food products accounted for 6 percent, and industrial products accounted for 92 percent of Taiwan's total exports. ^{1/} Textiles and electronics were the two most important export industries, accounting for over 60 percent of the value of Taiwan's foreign shipments in 1980 (Table 77). In 1983, for the first time, textiles was supplanted by electronics as Taiwan's leading export item. Major exports were knitwear, textile products, footwear, electrical machinery, and miscellaneous manufactures.

Table 77.--Taiwan: Value of Taiwan's imports and exports, by sectors, 1975 and 1980

(In millions of New Taiwan dollars)			
Category	1975	1980	
	Imports		
Agriculture, forestry, and livestock-----	33,548	79,436	
Minerals (including petroleum)-----	26,348	168,591	
Food, beverages, and tobacco-----	6,213	15,271	
Textile, leather, wood, and related products-----	16,022	40,489	
Nonmetallic mineral products-----	7,214	27,894	
Chemical and pharmaceutical products-----	30,974	72,974	
Basic metals-----	19,455	70,793	
Metal products-----	77,673	206,212	
Miscellaneous manufactures-----	5,593	21,471	
All other-----	3,420	8,301	
Total-----	226,460	711,433	
	Exports		
Agriculture, forestry, and livestock-----	10,418	18,323	
Minerals (including petroleum)-----	99	238	
Food, beverages, and tobacco-----	22,509	47,342	
Textile, leather, wood, and related products-----	77,572	231,553	
Nonmetallic mineral products-----	4,342	24,661	
Chemical and pharmaceutical products-----	3,959	17,742	
Basic metals-----	4,648	14,207	
Metal products-----	46,582	208,887	
Miscellaneous manufactures-----	31,065	148,947	
All other-----	271	295	
Total-----	201,468	712,195	

Source: Customs Department, Ministry of Finance of the Republic of China, as cited in Industry of Free China, Taiwan Economic Statistics, June 1983.

^{1/} Council for Economic Planning and Development, "Economic Development in Taiwan, the Republic of China," May 1982.

Taiwan's import structure has changed little over the past decade. Raw materials and capital goods still dominate the import side of the ledger, accounting for 94 percent of imports in 1981. But the share of capital goods, which stood at 32 percent in 1971, dropped to 26 percent by 1981, while raw materials accounted for a larger percentage of Taiwan's imports, rising from 63 percent of total imports in 1971 to 68 percent in 1981. The share of consumption goods stayed relatively constant despite rapid rises in real personal income. ^{1/} In 1980, Taiwan's principal imports (Table 78) were metal products (such as nonelectric machinery, electrical machinery, and transportation equipment); minerals (mostly petroleum); chemicals and pharmaceuticals (principally chemical elements); and basic metals (almost all iron and steel). The United States is Taiwan's largest partner in two-way trade followed by Japan, Hong Kong, Saudi Arabia, and West Germany.

Taiwan's trade is concentrated in several major markets. The United States took over 45 percent of Taiwan's exports in 1983, and Japan and the European Community purchased 10 percent and 9.5 percent respectively. Taiwan's leading import suppliers were Japan (27.5 percent); the United States (22.9 percent), and the oil exporting countries (15.1 percent). ^{2/}

In 1983, Taiwan's major exports to the United States were footwear, apparel, television receivers, radios, telephone apparatus, game machines, and furniture. Many U.S. investments in Taiwan's three export processing zones involve assembly of apparel and electronic products for ultimate shipment to the United States. Leading imports from the United States were grain, cash crops, integrated circuits, aircraft parts, chemicals, and electrical equipment. ^{3/} Taiwan imports less than 25 percent of its manufactured goods from the United States, but it does import substantial quantities of machinery and electronic equipment from Japan and the European Community.

Policy developments

The authorities have been developing annual, mid-term (4 to 5 year) and long-range (10 year) plans for the economy since 1953. Details of these plans are changed frequently, but the general thrust of central policy usually stays the same unless severe economic imbalances occur.

The Council for Economic Planning and Development (CEPD) formulates economic and industrial policy in Taiwan. In addition to setting economic goals, the 10-member Council oversees economic planning, makes economic projections, monitors major projects, and reviews budget proposals by various ministries.

^{1/} Council for Economic Planning and Development, "Economic Development in Taiwan, the Republic of China," May 1982; Far Eastern Economic Review, Aug. 21, 1981, p. 21.

^{2/} U.S. International Trade Commission, Operation of the Trade Agreements Program, 35th Report, 1983, USITC Publication 1535, June 1984, p. 310.

^{3/} U.S. International Trade Commission, Operation of the Trade Agreements Program, 35th Report, 1983, USITC Publication 1535, June 1984, p. 404-5.

The Ministry of Economic Affairs (MOEA) has daily responsibility for the administration of industrial policy and trade. Its Industrial Development Bureau develops sector-specific plans as well as suggests changes in tariff, investment, and financial incentives to support the plans' goals. MOEA also oversees policy by public enterprises, issues import licenses, and administers Taiwan's export processing zones. The Ministry of Finance oversees tax and investment policy. The Central Bank of China administers foreign exchange controls and oversees central industrial policy banks.

The authorities' economic strategy has gone through several distinct phases, which are briefly characterized below.

1949-1964.--When the Nationalist Government moved to Taipei in 1949, Taiwan's economy was in shambles. Taiwan's industrial base had been virtually destroyed by World War II and unemployment and inflation were widespread. During this phase, U.S. aid played a key role by providing needed funding for capital investment. To allocate this aid efficiently, the authorities set up a large planning mechanism charged with setting goals for the economy and channeling funds to projects designed to meet them.

The country embarked on a land reform movement and an ambitious economic development plan, focusing on increasing agricultural output, infrastructure development, and light manufacturing. The early plan was designed to encourage industries which produced substitutes for imported goods, and this succeeded in some cases. However, given the small size of Taiwan, this proved insufficient to sustain economic growth, and official emphasis shifted from import substitution to developing export industries such as food processing and textiles. In 1958, the authorities adopted foreign exchange and trade reforms designed to underpin its new outward looking strategy.

1965-73.--By the time U.S. aid was discontinued in the mid-1960's, the economy had stabilized. In order to generate enough foreign exchange to pay for necessary machinery and raw materials, the authorities encouraged export industries, such as textiles, food processing, and consumer electronics. It also laid the groundwork for development of more sophisticated industries, such as electronic machinery, steel, petrochemicals, and machine tools.

1974-1980.--The oil price rise of 1974 strongly affected Taiwan. For one of the first times in the postwar period, the growth in Taiwan's industrial output stalled in both 1974 and 1975. The authorities immediately raised oil prices to world levels, increased other state-set prices, and partially counteracted the negative economic effects of those price increases by adopting a stimulative fiscal policy revolving around 10 major infrastructure projects.

The infrastructure projects involved building various transportation facilities and setting up public enterprises to produce or process basic manufactures and raw materials--including petrochemicals, cement, aluminum, fertilizers, ship, and steel. (Today, 7 out of the top 10 companies--in terms of gross revenues--in Taiwan are publicly-owned.) The authorities' policy in the mid-1970's encouraged the development of more viable motor vehicle, machine tool, and electrical machinery industries. The authorities also sought to promote backward integration by fostering intermediate-goods industries and attempted to encourage research and development by setting up publicly-funded research laboratories and a state-supported industrial park for high technology industries.

Current policy.--1/ Taiwan's industrial policy dramatically changed in 1981 in response to changed economic conditions. 2/ Though most firms had weathered the first oil shock well, a number of firms had begun to experience overcapacity and declining competitiveness by the time the second oil shock occurred. Meanwhile, weaknesses in management, distribution, and sales began to undermine efforts to broaden markets for Taiwan's products.

In response to these pressures, Taiwan authorities have increasingly scaled down and more finely-tuned industrialization plans. For example, the authorities have shifted from indirect assistance to private firms or outright ownership of firms in key sectors to direct grants, loans, and strategically-planted seed money for firms in the private sector. In response to worldwide overcapacity in basic industries such as shipbuilding and aluminum smelting, the authorities have also begun to scale-down expansion plans and to rationalize the production of state-run firms. 3/

Meanwhile, the authorities have slowly begun to open Taiwan's market to imports and to more actively use approval of foreign investment in Taiwan to encourage a shift from labor-intensive operations to capital-intensive investments involving technology transfer, development of management know-how, and improvements in distribution in Taiwan.

The 10-year economic plan adopted in 1980 focuses on promoting high-technology industries and integrating more sophisticated technology into traditional export lines. The plan calls for diversification both of the mix of goods produced by Taiwan and of the markets they are sold in. Taiwan is heavily dependent on exports, and foreign shipments are concentrated in four product areas (textiles, consumer electronics, footwear, and sporting goods) and in one major market--the United States. 4/

Macroeconomic goals.--On the macroeconomic level, the plan aims for average annual growth in real GNP of 7.9 percent. The contribution of foreign trade to GNP will continue to be greater than domestic consumption. The plan predicts that exports, which now account for approximately 54 percent of GNP, will account for more than 80 percent by 1989. (Both exports and imports are

1/ This section is based largely on the following articles, "Taiwan: The Weight of Success," Far Eastern Economic Review, Dec. 8, 1983, p. 65-72; Yuosang Yun, "Asia: The Outlook Beyond the Immediate Recovery," paper presented at the DRI International Outlook Conference in New York on May 23, 1984; "Taiwan: Riding High on Exports," Far Eastern Economic Review, Apr. 5, 1984, p. 58; "Taiwan," in the Asia Yearbook, 1983, Far Eastern Economic Review, 1984, p. 268-272; "Taiwan: The big bounce back," Far Eastern Economic Review, Mar. 22, 1984, p. 59-64.

2/ "New Cabinet to Seek Stability in Faster Growth," Business Asia, Dec. 4, 1981.

3/ As reported in the Economist, "Taiwan Survey," July 31, 1982, p. 9.

4/ Although Taiwan's national income is just under half the size of South Korea's, Taiwan is much more dependent on manufacturing and exports than is Korea. Exports of goods and services accounted for over half (54 percent) of GDP in 1980, compared to 11 percent in South Korea; meanwhile, manufacturing accounted for 42 percent of GDP in Taiwan compared with 29 percent in South Korea. Taiwan's dependence on manufactures is second only to West Germany. Far Eastern Economic Review, August 21, 1982, p. 21.

expected to grow at a real annual rate of 12.5 percent, but because the value of imports is lower, its share of GNP will progressively decline during the decade.) According to the plan, exports are to be increasingly directed to markets other than the United States and Japan. The plan makes clear Taiwan's intention to move toward a more open economy, suggesting that some barriers to trade will be eased within 10 years.

The plan projects investment and savings to equal about 35 percent of GNP at the end of the decade. Investment growth is to come increasingly from private, rather than public sources, while savings growth will rely more on individuals and privately-held corporations. 1/ 2/

Industrial priorities.--The plan spells out six factors that the authorities will use to decide which industries will receive priority treatment in the 1980's: (1) linkage to other major industries in Taiwan; (2) low energy-intensity; (3) low pollution; (4) contribution to net exports; (5) high domestic value-added; and (6) technology-intensiveness. 3/

In addition, the plan specifically calls for developing higher technology products in three strategic industries: information, electronics, and machinery. The products to be encouraged in those industries include precision instruments and machine tools, video cassette recorders, telecommunications equipment, computers, cars, and car parts. Output of the higher technology industries is to increase at an average rate of 14 percent each year (see table 78). As a result, their contribution to manufacturing output could increase from about 24 percent in 1980 to 33 percent in 1989. Under the plan, the authorities will underwrite 17 major R&D projects in the higher technology industries, including research on new measuring instruments, VLSI semiconductors, computer technology, laser technology for machine tools, industrial materials, chemicals, shipbuilding, and textile dyeing and finishing.

1/ Gross national savings as a percentage of GNP has exceeded 30 percent in recent years, one of the highest rates in the world. In addition to abundant domestic savings, capital inflow in the form of investment and loans has been significant. See Chen Sun, "The New Four-Year Plan for Taiwan, Republic of China," Industry of Free China, August 1982.

2/ The Government is seeking to reverse a trend started in the 1970's where a rising portion of total investment in Taiwan came from the public sector. Public sources accounted for 51.3 percent of gross domestic capital formation in 1981, a sharp increase from 1971. The increased public share is partly attributable to the 10 major infrastructure development projects begun in the early 1970's, and partly due to the fact that many industries which the Government controls expanded capacity during the 1970's, including power generation, petroleum refining, petrochemicals, fertilizer, aluminum, steel, and shipbuilding.

3/ Until recently, the authorities' efforts to reduce Taiwan's dependence on imported oil focused on developing alternative sources of energy. But, in the new plan the Government indicated its intention to "restrain the growth of energy-intensive industries." Furthermore, it has placed a ceiling on new investments in labor-intensive industries, such as textiles.

Table 78.--Taiwan's industry-specific output goals, 1980-89

Sector	1979	Share of total	1989	Share of total	Average growth 1980-89
	<u>Million dollars</u>	<u>Percent</u>	<u>Million dollars</u>	<u>Percent</u>	<u>Percent</u>
High technology:					
Transportation-----	1,002	7.3	3,700	10.1	14.0
Telecommunications----	841	6.1	3,316	9.0	14.7
Electronics-----	604	4.4	2,087	5.7	13.2
Machinery-----	509	3.7	2,285	6.5	16.7
Household appliances--	334	2.4	992	2.7	11.5
Total-----	3,290	23.9	12,480	34.0	14.3
Minerals and metals:					
Iron and steel-----	495	3.6	1,711	4.7	13.2
Other metal-----	791	5.7	2,974	8.1	14.2
Other minerals-----	584	4.2	1,475	4.0	9.7
Total-----	1,870	13.5	6,160	16.8	13.2
Chemicals and petrochemicals:					
Petroleum products----	664	4.8	1,358	3.7	7.4
Petrochemical stocks-----	263	1.9	664	1.8	9.7
Manmade fibers-----	541	3.9	1,226	3.3	8.5
Plastic materials-----	205	1.5	565	1.5	10.7
Plastic products	680	4.9	1,429	3.9	7.7
Other chemicals-----	1,249	9.0	2,689	7.3	8.0
Total-----	3,601	26.1	7,931	21.5	8.2
Other industries-----	5,040	36.6	10,232	27.7	7.3
Textiles-----	1,950	14.1	3,916	10.6	7.2
Lumber, wood products--	439	3.2	697	1.9	4.7
All other-----	2,655	19.2	5,619	15.2	8.9
Total, manufacturing:	13,801	100.0	36,803	100.0	10.3

Source: American Institute in Taiwan, Taipei, AITGRAM 02413, May 13, 1980, and AIT air pouch No. A-019, May 15, 1980.

Other investment projects are also planned: 12 major and 120 smaller projects are scheduled at a total cost of about \$86 billion, ^{1/} most of which will be provided by the authorities. Several of the projects are in the manufacturing sector: the authorities plans to expand facilities at the state-controlled China Steel Corp., and to underwrite construction of heavy equipment, auto parts, and petrochemical facilities.

Numerous factors may prevent the authorities from successfully implementing the industrial development goals of the plan. The domestic market may be too small for firms to develop economies of scale in industries

^{1/} Unless otherwise indicated all dollar figures are U.S. dollar figures. New Taiwan dollars will be indicated by N.T. dollars or NT\$.

such as cars and computers. Attempts to shape foreign direct investments in Taiwan--such as export and local content requirements--may actually work against the authorities' hopes of attracting major investments in targeted industries. The authorities are also likely to face an uphill battle in its efforts to encourage research and development, since most firms continue to rely on relatively cheap foreign technology for their production processes.

The authorities will use both traditional and new strategies to help targeted industries. Among the more traditional methods, the authorities will employ market protection, investment and export incentives, and low-cost loans. A new program, the central-satellite firm system, is intended to create long-term links between large firms and small supplier companies, improve the quality of goods produced by the small firms, and promote product standardization. Meanwhile, the Hsinchu science-based industrial park and centrally-sponsored research projects will be used to implement Taiwan's technology thrust. Each of these strategies is discussed in greater detail below.

Home market protection

Throughout the postwar period, Taiwan has used its ability to regulate trade and screen foreign investment to protect local industries and to broaden its industrial base. Imports of nonessential items, such as consumer products are substantially curbed while raw materials and sophisticated capital goods can be imported with few restrictions.

Although Taiwan has liberalized its import regime somewhat in recent years, its average tariff rate remains high (about 30 percent). Tariffs on some manufactured and luxury goods are much higher, while those for raw materials and capital goods are lower. In addition to tariffs, imports are sometimes limited by bans of particular products and case-by-case import licensing. Recently, the authorities have begun to cut back on some of these restrictions. A package of tariff cuts was announced in both 1983 and 1984, and the number of items requiring case-by-case import approval has been reduced.

Approval of foreign investment usually hinges on a firm's commitment to purchase a certain percentage of its inputs from domestic sources and to export a certain percentage of its output--respectively referred to as "local content" and "export performance requirements." Although the authorities plan to continue using the screening process to ensure technology transfer, use of locally manufactured goods, and high export levels, they have said that investment performance requirements will be applied more flexibly in the future.

Import and export licensing

Most imports and exports must be licensed by the Taiwan authorities. This can be used by the authorities to protect local manufacturers from competing products and to dampen imports of luxury goods. 1/

1/ Taiwan also uses licensing and foreign exchange controls to diversify markets and to restrict or favor sources of supply. For example, the Taiwan Government has long favored imports from the United States over imports from Japan.

About 10 percent of the value of Taiwan's imports do not require licensing. The remainder falls into several possible categories: "permissible," "controlled," and "prohibited." Goods on the "permissible" list include about 99 percent of the product classification categories and 70 percent of the value of Taiwan's imports. Applications for licenses to import "permissible" goods are automatically approved. An official import licensing list specifies which items are permissible, controlled, prohibited, and restricted by area. 1/ (For political, diplomatic, or economic reasons, restrictions are placed on the import of certain permissible products from designated procurement areas.) About 20 percent of the value of Taiwan's imports, mostly luxury goods and certain products that compete with locally made goods, fall into the "controlled" category. "Controlled" items require individual approval by the Board of Foreign Trade (BOFT) of the Ministry of Economic Affairs and can only be imported directly by end users.

As Taiwan's trade volume increased, it became extremely impractical for one Government agency to issue all import licenses. The BOFT now allows foreign exchange banks to issue import licenses for "permissible" goods. Today, banks issue about 70 percent of all import licenses in Taiwan. The Board also has delegated licensing authority for "permissible" goods to the administering authorities of Taiwan's three export processing zones and the Hsinchu Science Park.

Export licenses are used to administer quotas and orderly marketing arrangements, to prevent trade with communist countries, and to block the shipment of militarily sensitive equipment to unfriendly countries. As part of its effort to crack down on exports of counterfeit goods from Taiwan, the authorities are also using the licensing requirement to require proof of permission to use trademarks, brand names, patents, or other proprietary materials.

The authorities charge fees for both import and export licenses. 2/ Receipts from these fees are used to underwrite export promotion efforts by the China External Trade Development Council (CETDC).

In addition to the licensing procedures, all imports and exports must clear the Customs Bureau of the Ministry of Finance. Many domestic and foreign firms have complained about procedural delays by Customs.

1/ This list is contained in the "Classification of Import and Export Commodities of the Republic of China" published by the Board of Foreign Trade (BOFT) within the Ministry of Economic Affairs. Items for which licenses are not needed are listed in the "Commodities of Import and Export without Permit."

2/ In the case of goods shipped from export processing zones, the fee is 0.3 percent of the value of the shipments and is used to defray the costs of managing the zone's warehousing, loading, transportation and other facilities. Other exports are subject to a 0.06275% fee.

Tariffs

Because Taiwan is not a member of the General Agreement on Tariffs and Trade (GATT), its tariffs are not bound by international agreement. Domestic legislation allows the authorities, at their discretion, to raise or lower tariffs by 50 percent. More favorable duties are applied to goods from the 113 countries giving Taiwan reciprocal most-favored-nation trade treatment, including the United States. ^{1/}

Taiwan's tariff rates range from 10 to 100 percent ad valorem. Low duties are levied on essential raw materials and machinery. Manufactured goods are assessed duties ranging from 35 to 80 percent, and luxury goods are assessed tariffs of 80 percent and up. The highest tariffs are assessed on textiles, electronics, footwear, toys, and sporting goods, paper products, motor vehicles--all important industries in Taiwan--and luxury goods, such as cigarettes, cosmetics, furs, chinaware, jewelry, and furniture. The dutiable value of imports is calculated as the c.i.f. price of the goods plus a 10 percent customs valuation uplift. The uplift is scheduled to be reduced to 5 percent in January 1985 and to be eliminated by the end of 1985.

Permanent tariff changes must be approved by the legislature, but the Government has the authority to raise or lower tariffs by 50 percent without new legislation for a period up to one year. The Government used this provision in 1982 to implement a 50 percent reduction in tariffs on most machinery and equipment needed to improve the competitiveness of Taiwan's industries. Although the tariffs on these products recently went back up to their usual rates, the government is currently considering permanently lowering duties on these items.

On the other hand, the authorities can raise tariffs on products that compete with domestic industries whenever it wishes. Private manufacturers can petition the authorities to consider changes in particular tariff rates. Recently, for example, when reviewing an import license application for farm machinery, the authorities decided that the domestic industry needed protection. It ultimately refused the import license application and raised the tariffs on the item.

In response to increased competition in its own market, Taiwan adopted regulations in mid-1984 to protect domestic producers from dumping and import surges. ^{2/} Under the regulations, the authorities can impose "stabilization" and "antidumping" tariffs following an investigation by an administrative panel. Countervailing duty laws are already in effect.

^{1/} In 1979, the United States and Taiwan agreed that they would follow the principles of the codes of conduct adopted during the Tokyo round of multilateral trade negotiations in their trade dealings with each other. In December 1981, the United States and Taiwan also exchanged tariff concessions. Both countries made these concessions available on a most-favored-nation basis.

^{2/} China Times, Aug. 21, 1984. According to the Ministry of Finance, such cases would be handled by an ad hoc committee consisting of representatives from the Central Bank of China, the Council for Economic Planning and Development, the Board of Foreign Trade, the Industrial Development Bureau and the Customs Administration. A Taiwan stainless steel producer may soon test those rules.

Although nominal tariffs are high, actual duties collected were only 8 percent of the value of Taiwan's total imports in 1982. Imports into Taiwan's three export processing zones are duty-free. As noted previously, duties on specific machinery are now half of what they would be normally. Furthermore, exporters and firms in targeted industries often qualify for duty rebates or deferred payment of import duties. As part of a general revision of the tax system--the authorities plan to move to a value added tax system within in the next decade--the authorities decided to do away with the duty-rebate system by 1990. As part of this process, they plan to reduce import duties on particular items and to phase down the percentage (now 100 percent) of duties paid that can be rebated. 1/

Restricted distribution of imported products

Until June 1984, trading firms in Taiwan were only permitted to import products if they had exported \$200,000 worth of domestically produced products in the preceding year. The BOFT lifted this restriction in June 1984, however, in an attempt to stem Taiwan's burgeoning trade surplus.

Foreign exchange controls

Foreign exchange controls have been in effect since 1958. However, foreign exchange controls do not appear to be used to prohibit particular transactions. Once an import license is issued by the Board of Foreign Trade, the importer can obtain foreign exchange from any licensed foreign exchange bank.

Closed Government procurement

The authorities are the principal purchaser of sophisticated research and scientific equipment, computers, and certain manufacturing machinery and supplies in Taiwan. 2/ Though they have announced their intention to favor domestic suppliers in procurement, the authorities have had to rely on foreign sources for most sophisticated equipment.

Generally, public procurement in Taiwan is handled through either the Central Trust of China, an agency that imports various products for administrative and military organizations and for public enterprises, or The Taiwan Supply Bureau, another agency that handles imports for the provincial government.

1/ These rebates are part of a more comprehensive plan to encourage investment by targeted industries. The plan, along with a list of targeted industries and products, is spelled out in the Statute for Encouragement of Investment, discussed later in this report.

2/ The Government has a monopoly position in public utilities and telecommunications industries, it owns or controls major banks and insurance companies, and it has interests in oil and natural gas, petrochemicals, steelmaking, shipbuilding, machinery, and fertilizers, among others.

The procurement process appears to be open to foreign firms. The Central Trust of China has a procurement office in New York and San Francisco and it accepts bids, quotations, and specifications in English. It also allows bids by local offices of foreign companies and trading companies. Furthermore, bids to supply products which do not exactly meet the specifications of the request for bids, but which would meet the performance requirements, are considered on the same footing as other qualified bids. ^{1/}

According to Taiwan law, all contracts valued at over \$100,000 must be open to foreign bidding. Many of those contracts are for heavy or sophisticated machinery and are supplied by Japan, the United States, and European countries. For example, U.S. computer makers are the leading suppliers of computer-related equipment to the Taiwan Government.

Before bids are opened, the authorities set a ceiling price for the item in question. Contracts are generally awarded to the bidder who meets the requirements of the invitation and whose bid is the lowest one below the ceiling price. If none of the bids fall below the ceiling price, the Central Trust of China reopens bidding.

At the beginning of each fiscal year, every official organization must file a detailed estimate of its import needs with the Board of Foreign Trade. Approval of each request is granted as long as similar domestically produced goods are not available in sufficient quantity, or if the price of the locally made product is more than 15 percent higher than the landed cost of the imported good.

Restrictions on foreign direct investment

By 1981, Taiwan had attracted some \$3 billion in foreign direct investment. Over one-fourth of the total was invested in the electrical and electronic industries (\$852 million), while another 13 percent was directed to the chemicals industry (\$388 million), and an additional 5 percent, to the machinery industry (\$164 million).

In the 1973-80 period, foreign firms were responsible for 10 percent of total investment in Taiwan's manufacturing sector, accounting for more than half of the total in the electronics industry, 25 percent in machinery, 20 percent in rubber and petroleum, and 9 percent in the footwear industry. Approximately \$400 million has been invested in Taiwan's three export processing zones. More than 75 percent of those funds came from foreign firms, particularly those based in Japan, the United States, and Europe.

The United States is the leading source of foreign direct investment in Taiwan, accounting for \$776.3 million (Japan is second, with \$457.7 million.) More than half of the U.S. investment in Taiwan is in the electronics sector. Chemicals, plastics, machinery, metal products, banking, insurance, and other services were also significant areas for U.S. direct investment in Taiwan.

^{1/} Central Trust of China, "Instructions for Bidding," as revised on July 1, 1981.

The basic laws governing investment in Taiwan are the Statute for Encouragement of Investment, the Statute for Investment by Foreign Nationals and the Statute for Investment by Overseas Chinese. Foreign investment is generally allowed 1/ if it results in the establishment of (1) productive enterprises needed in Taiwan or firms that generally are conducive to the economic and social development of Taiwan; (2) enterprises which are totally export-oriented; or (3) enterprises which develop and improve domestic capabilities in specified "important" industrial, mining, and communications sectors. The authorities do not require foreign firms to form joint ventures with local interests, even in strategic sectors.

Export performance requirements.--Until recently, strict export performance requirements meant that foreign firms investing in Taiwan had to export half of their production. In early 1984, the Minister of Economic Affairs announced that in certain cases Taiwan would no longer hold foreign companies so strictly to this requirement. However, foreign investors in some targeted industries will still face such requirements. For example, according to Ministry of Economic Affairs officials, export requirements will still be rigidly enforced in autos. In other industries, the officials said, export quotas will be more flexibly applied. Few foreign firms have complained about the requirements because, with Taiwan's limited internal market, they usually invest for export purposes.

Local content and other requirements.--The authorities may also require specified technology transfer, local ownership, and local content before approving foreign investment applications. Local content requirements specifying a certain percentage of the final product's value that must be made in Taiwan are now in effect for a number of manufactures. These include automobiles, television sets, telephone equipment, motorcycles, and steelmaking equipment. The required local content varies by product, but usually ranges from 50 to 100 percent. Local content requirements for new investments are limited to four categories: VTRs, automobiles and trucks, televisions, and motorcycles. 2/ The local content ratio is measured by the value of completed knocked down parts less imported parts divided by the total price of the final good (labor content in the final assembly is not included in the calculation). If at least 50 percent of the value of a part is derived from locally procured materials, the part qualifies as locally made.

1/ No private investment is allowed in firms involved in producing military goods, or in the tobacco, wine, utility, and petroleum industries. Also, inland transportation is closed to foreign investment while foreign investment in trust companies and other nonbank financial institutions is limited to 40 percent of the registered capital. Foreign banks can establish branches in Taiwan if they have done over \$4 million in business with Taiwan financial institutions and they have been doing business with Taiwan banks for more than ten years. These conditions are dropped when Taiwan banks have branches in the home country of the foreign bank.

2/ For televisions, the Government requires 60 percent local content, but will eliminate that requirement in 2 years; for VTRs, local content requirements are 45 percent currently and will be increased to 55 percent in 2 years; for cars, required local content is 70 percent and for light trucks and heavy trucks 30-55 percent (at this time, neither is slated to be reduced or eliminated).

Tax policy 1/

Since 1960, tax policy has been one of the most important methods used by the Taiwan authorities to achieve industrial policy goals. Today, the authorities use the tax system to encourage production of high value-added goods, to underwrite productivity-improving investments, and to reward export-oriented firms. In general, foreign-owned firms are treated equally with local firms under Taiwan's tax code.

In fiscal year 1983, tax revenues accounted for two-thirds of total income. 2/ Though low by international standards, the average tax burden (all taxes, including income) has risen slowly over the past 20 years, standing at 20.0 percent in 1981. 3/ The principal taxes in Taiwan are income, commodity, customs, land, and business. The share accounted for by income taxes has steadily risen, climbing from 24.4 percent in 1954, to 26.6 percent in 1974, 30.8 percent in 1978, and 38.0 percent in 1982. 4/

Corporate income tax rates range from 0 to 35 percent, as illustrated below:

<u>Businesses with taxable income of--</u>	<u>Maximum tax rate</u>
NT\$0-50,000-----	Exempted
NT\$50,000-100,000-----	15 percent of taxable income over NT\$50,000
NT\$100,000-500,000-----	25 percent of the excess over NT\$100,000
More than NT\$500,000-----	35 percent of the excess over NT\$500,000

Tax incentives and targeting

The Statute for the Encouragement of Investment is the principle vehicle by which the authorities attempt to shape private investment decisions. In it, specific tax incentives are spelled out, while criteria for products and

1/ Based primarily upon The Economist Intelligence Unit, The ASEAN, Hong Kong, South Korea, and Taiwan Economies: Their Structure and Outlook into the 1980s, London: The Economist Intelligence Unit, Ltd., 1980; Asia Research Bulletin, Oct. 31, 1982, p. 980; U.S. Department of Commerce telegram/AIT Taipei 05020, Aug. 27, 1983; Price Waterhouse, Doing Business in Taiwan, August 1979; U.S. Department of Commerce, International Trade Administration, Investment Climate in Foreign Countries, Vol. III, Asia (Excluding Japan), August 1983; Lawrence Lu, "New Incentives and Current Guarantees for Foreign Investment in Taiwan," Industry of Free China, June 1979; and, Yu Kuo-Hwa, "Government Efforts to Spur Investment," Industry of Free China, February 1978.

2/ Council for Economic Planning and Development, Economic Development in Taiwan, the Republic of China, April 1984, p. 36.

3/ Council for Economic Planning and Development, Executive Yuan, Taiwan Statistical Data Book, 1983, p. 161, based on Ministry of Finance data.

4/ Ibid., p. 163, based on Ministry of Finance data.

types of firms qualifying for special treatment are listed in implementing laws. These criteria are updated frequently to reflect changes in industrial policy and market conditions. 1/

The authorities use two approaches to promote industry through the tax system. First, they make incentives available to firms in the segments of existing industries which they feel will be competitive in the future. The specific eligibility criteria for such tax incentives are spelled out on an industry-by-industry basis in implementing resolutions to the Statute. 2/ Depending on the situation in the industry, tax incentives might be available for exporting, achieving economies of scale, increasing domestic content, or upgrading production technology. For example, in ethylene manufacture, only firms with a minimum capacity of 200,000 metric tons can qualify for incentives. 3/

The second approach to using incentives involves designating "strategic" industries. Unlike the above approach, which may apply to a few firms in most industries, this approach applies to most firms in a few, specially selected industries. These industries can broadly be described as growth industries with export potential such as automobiles, computers, electronics, and machinery. 4/

Firms that fall into these two categories qualify for numerous tax benefits, including up to 9 years of exemption from corporate income taxes, and rebates of import duties, transactions and excise taxes.

The main benefits for targeted industries are described below:

- New firms may choose either to take a 5-year tax holiday or depreciation of new, state-of-the art equipment at a rate twice as fast as is normally allowed. 5/ The company may defer the start of the tax holiday for up to 4 years. In addition, revenues arising from subsequent increases in productive capacity are tax-free for 4 years, or further equipment

1/ The Statute was promulgated on Sept. 10, 1960 and amended in 1960, 1965, 1967, 1970, 1973, 1974, 1977, 1978, 1979, 1980, and 1981.

2/ Particular types of firms in the food processing; pulp and paper; rubber processing; chemicals; non-metallic mineral processing; basic metallic manufacturing; machinery; electrical equipment manufacturing; electronics; transportation equipment; textiles and apparel; other manufacturing; mining; agriculture; forestry; fishery; animal husbandry; transportation; warehousing; public utility; housing construction; technical services; tourist hotel; and, heavy equipment construction industries qualify for "encouragement" in Taiwan. (As described in "Categories and Criteria of Productive Enterprises Eligible for Encouragement, May 1982.)

3/ As cited in the "Categories and Criteria for Productive Enterprises Eligible for Encouragement," as revised and promulgated by the Executive Yuan on Jan. 7, 1982.

4/ Many firms in the machinery; automobile parts; electric machinery; computer system products; consumer electronic products; electronic components; electronic communications equipment; electronic industrial systems; and computer software are considered "strategic" in Taiwan. As listed in "Applicable Scope of the Strategic Industry," Sept. 24, 1982.

5/ The normal service life of equipment for tax purposes is set out in Government guidelines.

expenditure may be depreciated at an accelerated rate. Almost all firms choose the 5-year tax holiday over accelerated depreciation. The Statute requires that domestically-made products be purchased, but exemptions are often made for sophisticated equipment. Therefore, the tax incentives may actually boost imports somewhat in the short run.

- Reduced income tax rates are also assessed for targeted industries. The maximum income tax rate is lowered from the normal rate of 25 or 35 percent to 22 percent.
- Firms in targeted industries often do not have to pay import duties or can pay them on a deferred basis.

Export tax incentives

Exporting firms also qualify for preferential tax treatment under the Statute. However, most of these measures--including the rebates of domestic business (transaction) taxes, commodity (excise) taxes, stamp taxes, and import duties--are intended to prevent double taxation. The following incentives are available to exporting firms:

- Business taxes 1/ are not applied to export sales.
- The enterprise may set aside a tax-free reserve for foreign exchange losses equaling up to 7 percent of the outstanding amount of foreign currency loans.
- The enterprise may set aside a tax-free reserve for losses arising from exporting not to exceed 1 percent of the prior year's export sales.
- Stamp taxes 2/ on exports and services which earn foreign exchange are reduced from 0.4 percent on domestically sold merchandise to 0.1 percent.
- The allowable income tax deduction for entertainment expenses is increased for export firms. 3/ This is designed to take into account the higher cost of international travel.
- A commodity tax, which ranges from 3 to 120 percent ad valorem, is levied on 19 types of commodities sold for consumption in Taiwan. The commodity tax is rebated if the goods are used in the manufacture of export items. To qualify for this rebate, the processed product must be exported within 1 year of the import. Commodity taxes are also waived if the goods will be used as raw material in the manufacture of another taxable commodity.

1/ Business taxes are assessed at a fixed percentage of gross revenues and are similar to transactions taxes.

2/ Stamp taxes are normally applicable to customs documents produced and receipts.

3/ Generally, companies may deduct 0.6 percent of the first NT\$10 million (approximately \$256,410 in 1983) of sales and 0.3 percent of the excess for entertainment expenses. Exporters can deduct an additional 2.0 percent of the total export sales for entertainment expenses. Furthermore, exporting companies can deduct an additional \$100 per day, per employee, as a per diem travel expense.

General incentives

In addition to tax incentives aimed at specific industries and to exporting firms, the Taiwan authorities also provide tax incentives to accomplish other objectives, as described below:

- To raise provincial revenues, a business tax is levied on gross business receipts (exported products are exempted). There are four different rates, with manufacturing paying 0.6 percent and banking and financial sectors paying 4.0 percent. This tends to encourage the growth of the manufacturing sector at the expense of the service sector.
- To encourage local companies to purchase foreign technology, royalty payments for technology can be deducted from taxable income. Similarly, income from licensing of technology, patents, and manufacturing processes is exempted from income tax.
- To encourage firms to list on the stock exchange, the Government allows them to lower their income tax bill by 15 percent for each of the 3 years following the public listing. Incorporated companies also qualify for an income tax rate of 25 percent, rather than the normal 35 percent.
- To encourage greater economies of scale in production, mergers are also encouraged by Taiwan's tax code and capital gains taxes are not assessed for firms merging with the approval from the Ministry of Economic Affairs. The tax bill of a firm after a merger is also reduced by 15 percent for the following 2 years.

The value of tax incentives

Table 79 shows the amount of tax reductions taken under the Statute for Encouragement of Investment from 1961-1982. The ratio of income tax foregone to total tax collected in Taiwan averaged 14 percent from 1960 to 1982. Income taxes were the principal taxes during the entire period. Income and business taxes foregone accounted for the bulk of tax expenditures. The share of income tax foregone was generally about 15 percent of revenues, but in 1982 and 1974, tax expenditures were over 20 percent of revenues. Total taxes foregone totaled NT\$25 billion in 1982--roughly \$6.4 billion--out of collections of NT\$170 billion, or about \$43.5 billion. Total taxes foregone as a percentage of gross domestic capital formation by private and public corporations was 7.8 percent in 1982 (table 80). ^{1/}

^{1/} Because firms in the mining and manufacturing, agriculture, forestry and fisheries, transportation, warehousing, public utilities, public housing, technical services, hotel, and heavy machinery industries qualify for encouragement under the statute, total gross domestic capital formation, less capital formation by Government and households was used in this calculation.

Table 79.--Taiwan: Tax reductions under the Statute for
Encouragement of Investment, 1962-82

Year	Total			Income Tax		
	(A) Tax	(B) Tax	A/A+B	(A) Tax	(B) Tax	A/A+B
	reductions:	revenues		reductions:	revenues	
	Million New Taiwan	Percent		Million New Taiwan	Percent	
	dollars			dollars		
1962-----	400	3,149	11.3	175	813	17.7
1963-----	314	3,401	8.5	193	767	20.1
1964-----	348	4,060	7.9	196	1,131	14.8
1965-----	490	4,753	9.3	235	1,365	14.7
1966-----	642	5,010	11.4	274	1,281	17.6
1967-----	747	5,404	12.1	322	1,376	19.0
1968-----	948	7,158	11.7	346	1,822	16.0
1969-----	1,120	10,241	9.9	372	2,547	12.7
1970-----	1,509	11,861	11.3	518	3,438	13.1
1971-----	2,576	14,127	15.4	610	4,517	11.9
1972-----	2,634	17,135	13.3	926	6,219	13.0
1973-----	4,736	21,618	18.0	1,232	7,732	13.7
1974-----	6,386	32,447	16.4	3,026	13,777	18.0
1975-----	7,235	38,207	15.9	2,003	16,373	10.9
1976-----	8,262	49,131	14.4	2,804	18,373	13.2
1977-----	8,732	58,497	13.0	2,861	22,527	11.3
1978-----	9,941	69,559	12.5	4,067	27,349	12.9
1979-----	9,724	93,676	9.4	4,703	35,694	11.6
1980-----	14,611	114,708	11.3	5,280	45,052	10.5
1981-----	14,338	148,427	8.8	5,616	58,147	8.8
1982-----	25,049	169,807	12.9	13,381	65,542	17.0

Table 79.--Taiwan: Tax reductions under the Statute for Encouragement of Investment, 1962-82--Continued

Year	Business Tax			Stamp Tax		
	(A) Tax	(B) Tax	A/A+B	(A) Tax	(B) Tax	A/A+B
	reductions:	revenues:		reductions:	revenues:	
	Million New Taiwan	Percent		Million New Taiwan	Percent	
	dollars			dollars		
1962-----	53 :	621 :	7.9 :	129 :	343 :	27.3
1963-----	59 :	683 :	8.0 :	62 :	372 :	14.3
1964-----	63 :	760 :	7.7 :	89 :	436 :	17.0
1965-----	134 :	899 :	13.0 :	104 :	510 :	16.9
1966-----	74 :	951 :	7.2 :	274 :	537 :	33.8
1967-----	89 :	960 :	8.5 :	316 :	637 :	33.2
1968-----	211 :	1,208 :	14.9 :	371 :	770 :	32.5
1969-----	302 :	1,730 :	14.9 :	438 :	965 :	31.2
1970-----	388 :	2,179 :	15.1 :	587 :	1,126 :	34.3
1971-----	974 :	2,575 :	27.4 :	976 :	1,328 :	42.4
1972-----	771 :	3,044 :	20.2 :	944 :	1,575 :	37.5
1973-----	2,287 :	3,763 :	37.8 :	1,181 :	2,076 :	36.3
1974-----	1,679 :	5,737 :	22.6 :	1,628 :	3,201 :	33.7
1975-----	3,327 :	7,246 :	31.5 :	1,842 :	3,559 :	34.1
1976-----	3,181 :	8,863 :	26.4 :	2,159 :	4,436 :	32.2
1977-----	3,081 :	10,393 :	22.9 :	2,660 :	5,271 :	33.5
1978-----	3,681 :	12,137 :	23.3 :	2,145 :	6,269 :	25.5
1979-----	3,776 :	15,669 :	19.4 :	1,027 :	8,022 :	11.3
1980-----	6,872 :	20,543 :	25.1 :	2,375 :	10,180 :	18.9
1981-----	6,161 :	26,638 :	18.9 :	2,239 :	12,567 :	15.1
1982-----	7,805 :	30,182 :	20.5 :	3,547 :	13,224 :	21.1

Source: Directorate-General of Budgets, Accounting and Statistics, Executive Yuan, 1984.

Table 80.--Taiwan Gross domestic fixed capital formation,
by industries, 1979-82.

(In millions of New Taiwan dollars)				
Industry	1979	1980	1981	1982
Agriculture, forestry, and fishing-----	18,529	17,987	21,464	18,829
Mining and quarrying-----	2,829	1,817	1,550	1,836
Manufacturing-----	91,736	135,740	146,919	126,567
Construction-----	8,112	14,560	15,589	17,233
Electricity, gas, and water supply-----	49,644	71,964	73,548	82,542
Transportation, storage, and communications-----	65,181	80,116	77,399	84,378
Wholesale and retail trade-----	11,950	15,506	19,495	15,774
Banking, insurance, and real estate-----	4,322	6,188	6,170	7,063
Ownership of dwellings-----	52,231	64,694	72,830	69,028
Public administration-----	20,138	29,948	32,697	34,797
Other services-----	8,324	12,196	15,752	12,713
Total-----	332,996	450,746	483,413	470,860
Total, less capital formation by govern- ment and households---	232,325	317,167	334,003	322,586

Source: Industry of Free China, Taiwan Economic Statistics, June 1983, pp. 62-65.

Many of the general tax benefits provided in the Statute are rarely used. For example, those for investments in natural resources, pollution prevention equipment, machinery renovation, public stock offerings, research and development, and mergers were rarely taken advantage of in 1983 (Table 82). On the other hand, export tax incentives are used extensively. Over 1.4 million firms qualified for tax benefits because of their direct or indirect export activities in 1983. Over NT\$6.4 billion (US\$166 million) in taxes were foregone for this purpose in 1983. Tax incentives for targeted industries were much less widely dispersed, with only 575 firms claiming income tax exemptions or accelerated depreciation in 1983. Tax bills for those firms were lowered on average by NT\$3.054 million (US\$78,308) (Table 81).

Table 81.--Taiwan: Tax reduction due to implementation of Statute of Investment Encouragement, 1983--Continued

Items	Implementation of Statute of Investment Encouragement	Items of Reduction	Units		Tax Reduction	
			Cases Declared	Number of taxation	Amount Declared	Amount of Taxation
	Article 42	Exemption for the appreciated value of assets as a result of reevaluation.	172	207	96,642	91,405
	Article 43	Listed foreign currency debt				
	Article 46	Accelerated depreciation for purchases of equipment or devices for energy conservation.	42	69	3,959	3,816
	Article 47	Accelerated depreciation for purchases of equipment or devices for prevention of pollution.	-	-	-	-
	Article 83	Exemption for gains resulting from sales of stocks of enterprises transferred from the public ownership to private ownership.	-	-	-	-
		Subtotal	4,665	6,460	3,645,986	3,991,760
Security transactions tax.	Article 27	Temporary suspension on securities exchange tax on the valuable securities.	-	-	187	231
Business tax.		Subtotal	-	-	187	231
	Article 11	Exemptions from business tax for those engaged in supply of weapons, materials, . . . , communications to be used by national defense units.	406	407	6,403	6,404
	Article 29	Exemptions for profit-seeking enterprises engaged in certain export business activities.				
	Clause I:	1. Direct export business	906,981	965,706	4,909,990	4,922,978
		2. Indirect export business	570,623	575,598	1,563,949	1,604,049
		3. Handling international transportation business.	4,951	4,951	309,834	309,834
		4. Foreign exchange earned by providing consulting, repairing, designing, and other services to foreign customers.				
	Article 30	Exemption for enterprises engaged in building, inspecting, or repairing ships and airplanes navigating on international routes.	18,417	18,515	51,448	51,546
	Article 45	Exemptions for the organization entrusted by the government from business tax on the sale of land in the industrial district.	3,461	3,568	98,447	98,554
	Clause II					
		Subtotal	1,558,839	1,568,745	6,940,071	6,993,365
Stamp tax.	Article 11	Exemptions from stamp tax for enterprises engaged in supply of weapons, materials, communications to be used by national defense units.	406	406	3,906	3,906
	Article 28	Exemptions for agreements and contracts for security exchanges.	-	-	-	-

Table 81.--Taiwan: Tax reduction due to implementation of Statute of Investment Encouragement, 1983--Continued

Items	Implementation of Statute of Investment Encouragement	Items of Reduction	Units		Tax Reduction	
			Cases Declared	Number of taxation	Amount Declared	Amount of Taxation
Article 32		Exemptions for contracts relating to building, inspecting of, or repairing ships and airplanes navigating on international routes.	3,034	3,034	42,992	42,992
Article 33		Exemption for invoices issued by an enterprise for transactions relating to foreign trade.				
Article 38 Clause I		Item 1: Exemptions for certificates as a result of a merger or consolidation. Item 3: Exemptions for sales of machinery and equipment based on the plan of a merger or consolidation.	1,496,756	1,504,941	2,960,004	2,980,704
		Item 4: Exemption for sales of land and plant based on the plan of a merger or consolidation.	5	5	29	29
Article 83		Exemptions for those activities relating to transfer from public ownership to private ownership.				
		Subtotal-----	1,500,201	1,508,386	3,006,931	3,027,631

Financial Market Policy

Though some liberalization has taken place in recent years, Taiwan's financial system is still tightly controlled by the authorities. They control 11 of the country's 15 commercial banks. Alternative funding sources, in the form of venture capital and equity markets, are relatively underdeveloped. Furthermore, the public sector absorbs a large share of available funds, receiving 29 percent of all bank loans in 1982. Private industry, dependent on debt financing for 70-80 percent of its capital, relies on that banking system for most of its funds.

Moderate changes to Taiwan's financial system were introduced in 1982: a banker's acceptance market was created, and within one year it accounted for 8 percent of all loans. Banks were also allowed to vary their lending rates within a band set by the authorities. In an effort to breathe life into Taiwan's inactive stock market, after 1983, foreign investors were allowed to buy shares in Taiwan companies through an investment trust. ^{1/}

The four privately-owned commercial banks are relatively small compared with the 11 state banks (see table 82.) The 11 banks under control of the

Table 82.--Taiwan: Value of assets and number of branches of commercial banks in Taiwan, as of Oct. 31, 1980.

Bank	Deposits	Number of branches
	Million New Taiwan dollars	
Bank of Taiwan ^{1/} -----	122,641	52
The Cooperative Bank of Taiwan ^{1/} -----	85,591	64
The First Commercial Bank ^{1/} -----	71,219	99
Chang Hua Commercial Bank ^{1/} -----	70,748	98
Land Bank of Taiwan ^{1/} -----	70,341	50
Hua Nan Commercial Bank ^{1/} -----	64,198	81
City Bank of Taipei ^{1/} -----	40,531	17
The Farmer's Bank of China ^{1/} -----	23,714	17
Bank of Communications ^{1/} -----	18,186	9
International Commercial Bank of China-----	15,788	14
United World Chinese Commercial Bank----	7,477	1
Overseas Chinese Commercial Banking Corporation-----	5,619	8
The Central Trust of China ^{1/} -----	3,906	3
Export-Import Bank of China ^{1/} -----	^{2/}	1
Shanghai Commercial and Savings Bank----	1,595	1

^{1/} Majority owned by the authorities.

^{2/} Cannot accept deposits.

Source: Ching-ing Hou Liang and Michael T. Skully, "Financial Institutions and Markets in Taiwan," p. 178 in Michael T. Skully, ed., Financial Institutions and Markets in the Far East, New York: St. Martin's Press, 1982. Based on data from the Central Bank of China.

^{1/} Total foreign ownership in any one company is limited to 12 percent and each investor is allowed only a 3 percent stake in a single company. The Economist, "Taiwan Survey," July 31, 1982, p. 12-13.

authorities each have very clearly defined and separate functions, with two in particular involved in industrial targeting: The Bank of Communications and the Export-Import Bank of China.

In 1983, Private enterprises were the most important borrowers in Taiwan's banking system (46 percent of total lending), followed by private individuals (26 percent), public enterprises (23 percent), and agencies (4 percent). Private enterprises borrowed \$11.8 billion (NT\$460.2 billion), up from \$10.8 billion in 1982 (NT\$419.5 billion) (see Table 83).

Table 83.--Taiwan: Loans and discounts of domestic banks in Taiwan, by borrowing sector, 1961-83

(In percent)						
Month ended	Total	Government enterprises	Private enterprises	Individuals and others	Government agencies	
Dec. 31--						
1961-----	100	37	45	12	6	
1962-----	100	39	43	13	5	
1963-----	100	30	46	18	5	
1964-----	100	26	51	16	6	
1965-----	100	22	59	12	7	
1966-----	100	21	60	13	5	
1967-----	100	20	61	13	6	
1968-----	100	17	65	12	5	
1969-----	100	17	66	11	5	
1970-----	100	18	66	12	5	
1971-----	100	19	64	13	4	
1972-----	100	17	67	12	4	
1973-----	100	15	69	14	2	
1974-----	100	18	71	9	2	
1975-----	100	20	68	10	2	
1976-----	100	21	66	11	2	
1977-----	100	21	62	15	2	
1978-----	100	18	60	18	3	
1979-----	100	21	56	21	2	
1980-----	100	24	51	23	2	
1981-----	100	25	50	22	3	
1982-----	100	25	46	24	4	
1983 <u>1/</u> -----	100	23	46	26	4	

1/ For the month ended Nov. 30, 1983.

Source: Economic Research Department, the Central Bank of China, Financial Statistics Monthly, March 1984 issue, p. 76.

The manufacturing sector accounts for the bulk of private sector borrowing. The most active borrowers in the manufacturing sector were the metal products, textiles and wearing apparel, and chemicals industries. Most loans were used to finance current operations (see Table 84).

Table 84.--Taiwan: Loans and discounts of domestic banks in Taiwan to private enterprises, by industries, November 1983

(In millions of New Taiwan dollars)

Industry	Total	For Capital expenditures	For Current operations
Manufacturing:			
Food processing-----	38,649	3,125	35,524
Textiles and wearing apparel-----	57,453	9,097	48,356
Lumber and lumber processing-----	14,070	520	13,550
Paper and paper processing-----	12,465	2,236	10,229
Chemicals and chemical products-----	56,342	10,843	45,599
Nonmetallic mineral products-----	15,469	2,678	12,791
Basic metal industries-----	21,509	1,969	19,540
Metal products-----	68,142	9,219	58,923
Miscellaneous manufacturing-----	13,913	1,591	12,322
Subtotal, manufacturing-----	298,012	41,278	256,734
Agriculture, forestry and fisheries-----	18,323	3,758	14,565
Mining and quarrying-----	1,418	96	1,322
Electricity, gas and water supply-----	1,937	254	1,683
Construction-----	9,243	447	8,796
Wholesale and retail trade-----	97,281	2,734	94,547
Communication and transportation-----	12,365	4,356	8,009
Services-----	21,623	5,757	15,866
Total-----	460,202	58,680	401,522

Source: Economic Research Department, the Central Bank of China, Financial Statistics Monthly, March 1984 issue, p. 77.

In the public sector, manufacturing again led the list, with public enterprises in the utility, petroleum refining, and communications and transportation (mostly shipping) industries receiving most of the funding (table 85).

Government loans

The authorities have several major financial institutions directly charged with providing credit to targeted sectors of Taiwan's economy. The Bank of Communications (BOC) is the most important bank for carrying out industrial policy. It is charged with fostering the development of the manufacturing, mining, transportation and public utility sectors. The BOC extends concessional loans and credit guarantees to capital-intensive industries. The BOC also directly invests in new firms in high technology industries and advises customers on how to improve their management and increase technical innovation. The newest of the centrally-owned banks, the Export-Import Bank of China, extends credit and credit guarantees for exports of plants and equipment and overseas construction projects. The Small- and Medium-Business Credit-Guarantee Fund was founded in 1974 to help smaller firms secure private financing. The China Development Corporation, a semi-private trust company, also invests directly in firms in targeted industries.

Table 85.--Taiwan: Loans and discounts of domestic banks in Taiwan to public enterprises, by industry, November 1983

(In millions of New Taiwan dollars)

Use	Total	For Capital expenditures	For Current operations
Manufacturing:			
Sugar-----	9,540	589	8,951
Textiles-----	733	26	707
Paper and paper products-----	1,225	675	550
Fertilizers-----	797	1	796
Petroleum refineries-----	48,041	3,933	44,108
Basic metal industries-----	12,534	2,678	9,856
Machinery-----	4,700	1,404	3,296
Transport equipment-----	16,885	7,599	9,826
Miscellaneous manufacturing-----	16,750	544	16,206
Subtotal, manufacturing-----	111,205	17,449	93,756
Electricity, gas, and water supply-----	64,200	48,651	15,549
Construction-----	13,568	3,945	10,073
Wholesale and retail trade-----	17,510	10	17,500
Communication and transportation-----	25,440	14,715	10,725
Services-----	2,094	880	1,214
Total, Government enterprises-----	234,017	85,200	148,817

Source: Financial Statistics Monthly, Economic Research Department, the Central Bank of China, March 1984 issue, p. 77.

Much of the funding for industrial policy-related banks comes from the postal savings system. About 18 percent of all savings in Taiwan are deposited in the postal savings system. Those deposits are, in turn, routed by the Central Bank to various domestic banks, including government industrial policy-related banks. At the end of October 1980, the postal savings system had assets of some \$131 billion.

The Bank of Communications.--Taiwan's BOC has been involved in infrastructure financing for 76 years. In 1979, it was officially designated a development bank by the authorities and was required to allocate 70 percent of its new loans each year for mid-term project finance. It has authorized capital of NT\$10 billion (approximately \$256 million). Total loans and loan guarantees outstanding at the end of fiscal year 1983 stood at NT\$85.0 billion (approximately \$2.2 billion), with more than 42 percent going to finance infrastructure-related activities. The manufacturing sector--chemicals, textiles, metals, transportation equipment, machinery and electronics industries together accounted for slightly less than half of the BOC's new loans in 1983 (Table 86). ^{1/}

^{1/} Bank of Communications, Annual Report, 1983.

Table 86.--Taiwan: Medium- and long-term development loans by the BOC, by industries, 1979-83

Industry	1979	1980	1981	1982	1983
Actual (million New Taiwan dollars)					
Public utilities-----	5,452	10,823	12,277	21,881	23,200
Chemicals-----	1,682	1,953	3,901	8,932	9,380
Transportation-----	1,953	2,130	3,610	5,002	7,280
Textiles-----	712	1,079	1,831	3,334	5,550
Metals-----	<u>1/</u> 2,148	<u>1/</u> 3,690	<u>1/</u> 4,277	4,398	4,050
Transportation equipment--	1,953	3,002	3,662	3,874	3,620
Machinery-----	<u>2/</u>	<u>2/</u>	<u>2/</u>	2,627	3,250
Electronics-----	-	-	574	1,118	1,770
Other manufacturing-----	3,073	3,571	3,471	9,909	8,850
All other-----		-	-	1,419	6,350
Percent of total					
Public utilities-----	32.2	41.3	36.5	35.0	31.6
Chemicals-----	9.9	7.4	11.6	14.3	12.8
Transportation-----	10.7	8.1	10.7	8.0	9.9
Textiles-----	4.2	4.1	5.5	5.3	7.6
Metals-----	<u>1/</u> 12.7	<u>1/</u> 14.1	<u>1/</u> 12.7	7.0	5.5
Transportation equipment--	11.5	11.4	10.9	6.2	4.9
Machinery-----	<u>2/</u>	<u>2/</u>	<u>2/</u>	4.2	4.4
Electronics-----	-	-	1.7	1.8	2.4
Other manufacturing-----	18.7	13.6	10.3	15.9	12.1
All other-----		-	-	2.3	8.7

1/ Includes machinery.

2/ Included in the metals category.

Source: Bank of Communications, Annual Reports, 1979-83.

The BOC's interest rate is set at 2 percentage points below the average of prevailing long-term rates. 1/ Loans from the BOC must be repaid over a 10 year period, but firms may be given a 2 year grace period before loan payments begin.

1/ Interest rates in Taiwan currently range from 8.5 to 10.75 percent, as indicated: interbank (similar to federal funds), 5-6 percent; bank loans (commercial) short term, (commercial paper, certificates of deposit, treasury bills, bankers acceptances. Short-term interest rates are completely determined by the free market.), 8.25-10.0 percent; long term, 8.75-10.75 percent; money market and commercial paper, 7 percent.

An Investment Department was set up in July 1983. Through it, the Bank invests directly in capital- and technology-intensive firms. In 1983, the Bank invested NT\$972 million (approximately \$24.9 million) in seven major industries. Nearly one-half of those funds were directed to the electronics and machinery industries (see table 87).

Table 87.--Taiwan: Initial investments by the Bank of Communications, 1982 and 1983

Sector	Number of cases	Amount invested	Share of total
		<u>Million</u>	<u>Percent</u>
		<u>New Taiwan</u>	
		<u>dollars</u>	
1983:			
Electronics-----	10	247	25.4
Machinery manufacturing-----	8	221	22.7
Metal processing-----	8	186	19.1
Electric industry-----	1	119	12.2
Transportation machinery-----	1	45	4.6
Information industry-----	3	88	9.1
Chemicals-----	2	42	4.3
Other-----	1	25	2.6
1982:			
Electronics-----	7	188	54.3
Metal processing-----	1	16	4.6
Transportation machinery-----	2	68	19.6
Machinery manufacturing-----	2	31	9.0
Information industry-----	2	23	6.6
Chemicals-----	1	20	5.7

Source: Bank of Communications, Annual Report, various issues.

The Bank obtains its funds by issuing floating rate notes in the European and Asian financial markets and medium-term bonds in the domestic capital market. Also, in 1982, the Taiwan authorities decided that 40 percent of the increase in postal savings deposits would be redeposited with the Bank of Communications. As of the end of June 1983, these postal redeposits reached NT\$42.4 billion (\$1.1 billion), constituting the banks largest funding source.

The Export-Import Bank of China.--The Export-Import Bank of China (TEXIM) was established in January 1979 to implement central policy by providing medium- and long-term credits to finance exports of machinery, equipment, and capital goods, and to underwrite imports of raw materials and technical services. TEXIM's major types of business include loans, guarantees, and export insurance. The bank has an authorized capital of NT\$8 billion (\$295 million).

TEXIM's loans are only for capital equipment, but TEXIM also offers insurance against buyer default for all types of goods. TEXIM interest rates are comparable to those prevailing under the OECD Export Credit Arrangement, and are currently 1.5 percent above the interbank rate in Taiwan. The bank had outstanding loans of NT\$7.3 billion (\$187 million) at the end of fiscal 1983. The principal recipients of its financing have been the industrial machinery, machine tool, and shipbuilding industries (Table 88).

Table 88.--Taiwan: Medium and long term loans by TEXIM, by end user, 1979 to 1981

	1979	1980	1981
	Actual (NT\$ thousand)		
Medium term loans for exporters to purchase			
materials from abroad-----	8,966	253,721	2,521,435
Fixed rate relending facilities-----	--	797	144,312
Medium and long term export credits-----	109,214	868,784	3,090,968
Turn-key plants-----	46,370	162,459	347,406
Shipbuilding-----		614,294	2,695,196
Industrial machinery-----	55,694	71,539	29,971
Machine tools and others-----	7,150	20,492	18,395
Total disbursements-----	118,180	1,123,302	5,756,715
	Percent		
Medium term loans for exporters to purchase			
materials from abroad-----	7.6	22.6	43.8
Medium and long term export credits-----	94.4	77.3	53.7
Turn-key plants-----	39.2	14.5	6.0
Shipbuilding-----	--	54.7	46.8
Industrial machinery-----	47.1	6.4	0.5
Machine tools and others-----	6.1	1.8	0.3
Fixed rate relending facilities-----	--	0.1	2.5
Total disbursements-----	100.0	100.0	100.0

Source: The Export-Import Bank of China, Annual Reports, 1980 and 1981.

The bank is also offering preshipment and short-term export credits for purchases from small and medium-sized machinery producers in Taiwan. The total amount approved in FY 1983 was NT\$107 million (\$18 million). It also extended export insurance in 1,737 cases during fiscal 1983, amounting to NT\$2.38 billion (\$61 million).

As shown in Table 89, the leading users of export loans in 1983 were the food processing, textile, steel, machinery, electronics, and plastics industries. TEXIM accounted for roughly 37.2 percent of the direct export loans given by domestic banks in 1983. Another 34 percent of domestic export loans carried payment guarantees by TEXIM.

Table 89.--Taiwan: Loans for exports by domestic and foreign banks, by industries, November 1983

(In millions of New Taiwan dollars)

Industry	Total	Domestic banks	Foreign banks
Textiles, cotton and fiber-----	7,108	5,377	1,731
Textiles, wool-----	435	335	102
Cement-----	280	264	16
Plywood-----	793	639	154
Plastics-----	2,280	1,748	532
Rubber products-----	569	431	138
Iron, steel and machinery-----	4,160	2,169	1,991
Glass and glass products-----	37	34	3
Chemicals-----	786	429	357
Spices-----	23	23	-
Canned food products-----	1,641	900	741
Fruits, chilled or frozen-----	14	14	-
Seafoods, chilled or frozen-----	6,652	352	63
Electronics-----	2,343	1,015	1,328
Wires and cables-----	141	124	17
All other-----	8,718	5,713	3,005
Total-----	29,745	19,567	10,178

Source: Financial Statistics Monthly, Economic Research Department, the Central Bank of China, March 1984, p. 82.

The Small- and Medium-Business Credit-Guarantee Fund.--As mentioned previously, more than 50 percent of Taiwan's industrial output is produced by small- and medium-sized businesses. The Small- and Medium-Business Credit Guarantee Fund was founded in 1974 to provide credit guarantees financial institutions that lend to such firms.

The Fund extends eight kinds of credit guarantees, including those for general purpose loans, export financing, small scale business loans, import letters of credit, import duty on account, bill of exchange acceptance, commercial paper, and performance bond guarantees. In addition, it makes special guarantees in accordance with Government policy, including guarantees to provide relief to larger scale export and machinery concerns.

The Fund has steadily grown during its 9-year existence. As of July 31, 1983, the guarantee balance reached NT\$18 billion (approximately \$461.5 million), and 30,000 firms received guarantees.

The China Development Corporation.--Although the China Development Corporation (CDC) is only partially funded by the authorities, this specialized banking institution takes central policy into account when extending loans and loan guarantees or making equity investments in firms. In line with current policy, the CDC is now favoring technology-intensive industries in its lending.

In 1982, the CDC approved NT\$ 952.7 million (about \$23.8 million) in loans to private firms, with the average loan totaling NT\$21 million (\$525,000). Firms in the chemical industry accounted for 46.5 percent of the loans extended, followed by the food processing industry with 24.7 percent. The machinery and electronics industries received 11.5 and 7 percent, respectively. ^{1/}

CDC had direct investments worth NT\$1.07 billion (\$27.4 million) in 1982, spread over 49 firms: 17 firms in the chemical industry, 12 in the electronics industry, 5 in the machinery industry, 2 in the food processing industry, and 1 in the metal-processing industry. The remaining 12 companies were in other industries. ^{2/} At yearend 1982, total guarantees outstanding were worth NT\$718 million (\$18 million).

Direct spending by the Taiwan authorities

In fiscal year 1984 the Taiwan authorities spent approximately \$1.5 billion (18.5 percent of all central budget expenditures) for economic reconstruction, mainly infrastructure related projects. The budget also provided \$12.5 million for the 300,000 unit auto plant. Another \$375 million was used to subsidize new-product research and development, with the bulk going to state-run research institutes. Funds earmarked for export promotion and the development of export processing zones totaled another \$98.6 million.

Science and Technology Policy

Taiwan's science and technology policy has traditionally revolved around centrally-sponsored research laboratories and centrally-supported private research efforts. The most recent example of this strategy is the Hsinchu science-based industrial park, which was modeled on the Silicon Valley, California and Research Triangle, North Carolina complexes in the United States.

The authorities have a development plan for science and technology. The current one, covering the period 1982-89, calls for raising national expenditure on R&D by 15 percent a year, resulting in an increase in national R&D expenditures from 0.6 percent in 1979 to 1.2 percent in 1985 and 2.0 percent in 1989. The authorities intend to supply half of those funds directly, while public enterprises will indirectly supply another 20 percent. Four major areas are highlighted in the plan: energy; materials; science; information; and automation.

Specifically, the plan spells out the their intention to:

- plan the transfer and adoption of urgently needed foreign technologies. The authorities will be responsible for introducing new technologies for strategic industries and will cooperate with academia on important R&D programs.

^{1/} China Economic News Service, Financial and Investment Yearbook ROC, 1983-84, p. 57.

^{2/} Ibid.

- push development of the science-based industrial park and encourage foreign R&D-oriented industries to invest in or establish plants in Taiwan.
- promote manufacturing capabilities in a number of specific sectors: optic electronics; precision instruments; machine tools; polymers and high performance plastics; shipbuilding; new materials; computers and peripherals; electronics; and telecommunications equipment.
- promote standardization and increasing economies of scale for firms in those industries.
- underwrite specific research projects proposed by private firms and trade associations in the high technology sphere.

The authorities are apparently facing some difficulties in meeting the plan's goals. Although a number of tax incentives have been put in place to encourage research and development, these measures have not met with much success (see table 83). In response to these difficulties, the authorities imposed a requirement in 1983 that firms with paid-in capital of more than \$2.5 million must spend from 0.8 to 2 percent of its annual earnings on R&D. Failure to meet this requirement renders the firm ineligible for tax deferment, duty rebates, and other incentives.

The authorities set up a general-purpose development fund, a science and technology development fund, and a defense industry development fund within the Ministry of Finance to assist in the formation of technology-oriented firms. The Bank of Communications is also providing seed money to firms in strategic industries. However, in 1983, only 31 firms received money from the BOC.

Spending by the authorities on science and technology in fiscal 1984

The Taiwan authorities will spend \$375 million to subsidize new product research and development in fiscal 1984, with the bulk going to State-run research institutes. Most of this funding will be used to underwrite medical and health-related research. Other science and technology projects provided for in the FY 1984 central budget are: research on computer hardware and software design, semiconductors, robotics, laser technology, industrial materials, factory automation, and shipbuilding.

In 1983, the Executive Yuan's Development Fund and the Bank of Communications decided to jointly appropriate NT\$20 billion to continue financing the development of strategic industries through long-term low interest loans. A similar fund of NT\$10 billion was set up in late 1982. The development fund supplies 25 percent of funds for each loan and the BOC supplies the remaining 75 percent. The annual interest rates for such loans are set at 2 percentage points below the average interest rate for long-term loans announced by the Banker's association in Taiwan.

In late 1983, the authorities adopted a 10-point plan for encouraging technology development in Taiwan. As part of the plan, a technology development subsidy program was set up to encourage research and development of new industrial products and technological know-how. Under the program, domestic producers will essentially receive interest-free, success conditional loans. The initial funding of the program was \$3.75 million, all from the Government. In the first year of the program, July 1, 1983-June 30, 1984, the Government emphasized research on computers and electronics.

The Industrial Development Bureau (IDB) within the Ministry of Economic Affairs is responsible for overseeing the 10-point plan. All applications for development subsidies must be submitted to the IDB, although actual funding will be supplied by the new Industrial Product Foundation. The Foundation is funded by appropriations from the Executive Yuan's Development Fund, private sector contributions, and receipts from successful ventures.

The Committee for Development of New Products will oversee the IDB's activities. Acting under the aegis of the Ministry of Economic Affairs, the Committee will include representatives from the Council for Economic Planning and Development, the National Science Council, the Institute for the Information Industry, the National Bureau of Standards and the IDB.

The IDB has prepared a list of products whose developers will qualify for development subsidies. The list will be updated annually. Products selected for the 1984 program included: integrated circuits for color television, Chinese computer processing systems, very large integrated circuits, desk top personal computers, teletype terminals, computer disk drives and printing machines. Late in 1983, the IDB allocated \$870,000 for two projects designed to build color television circuits and computer disk drives. The two projects were sponsored by the state-funded Industrial Technology Research Institute and several leading electronics manufacturers (Sampo, Tatung, Teco Electric and Machinery, and Mabuchi Taiwan.) 1/

The Hsinchu Science-based industrial park

The Hsinchu science-based industrial park was started in 1980 with full financial backing by the authorities. It brings together a number of public and private research institutes, academic institutions, and leading high technology firms. Firms investing in the park enjoy substantial tax benefits, concessionary financing, low land costs, and centrally-provided support services such as warehousing, factories, and telecommunications facilities. However, the authorities have found it harder than anticipated to attract firms to the Park. In mid-1984, the occupancy rate in the Park was below projected levels.

The park will be developed in three phases over a 10-year period. Firms in the electronics and information, precision instrument and machinery, high technology materials science, energy science, aeronautical engineering, and biological engineering fields are encouraged to invest in the park.

1/ AITTA 07369, Dec. 27, 1983.

Incentives offered to investors in the park are as follows:

- Exemption of import duties on machinery, raw materials, supplies, fuels, and semifinished goods for use by firms. Duties are paid only if the goods eventually are sold domestically.
- Complete commodity and business tax exemption for exported products.
- A waiver on restrictions on applications for foreign exchange settlements to remit dividends or interest on invested capital.
- The National Science Council and two designated financial institutions will provide up to 49 percent of the total investment in a particular firm, upon request and screening. The private investor is encouraged to count technical know-how and patents as part of his 51 percent share, and such assets can account for up to 25 percent of his equity. In other words, an investor can start his operation inside the Park with only 26 percent of the total investment while owning 51 percent. Investors also have the option to buy the remaining 49 percent at a later date.
- As mentioned in the tax section above, all expenditures on research and development by private firms are tax deductible. In fact, firms which have attained specified scales of production must spend a minimum specified percentage of sales revenues in order to enjoy certain tax incentives offered by the authorities.
- Other privileges, such as 5 years free rental of land and low interest financing are also available.

Many U.S. firms are investing in the park. For example, Wang Laboratories, one of the first U.S. firms to invest in the park, began a joint venture with the China Development Corporation in 1981. Wang owns 75 percent of the venture and CDC owns the remaining 25 percent. In return for substantial incentives, Wang will transfer some of its technology to the Electronics Research and Service Organization (ERSO), a public research laboratory. Meanwhile, Texas Instruments withdrew its investment application, reportedly because the authorities sought to acquire too much of the firms proprietary information without providing adequate legal protection for it. IBM has recently begun a large venture in the park and is working closely with the Electronics Research and Service Organization and the Institute for Informatics Industry to develop peripherals and other equipment for sales in the Far Eastern market. Meanwhile some Chinese-owned firms have suffered from procedural delays by officials and a demonstrated preference for large foreign-owned firms.

Even before the park was established, many foreign firms had undertaken technical cooperation projects with Taiwan firms: between 1952 and 1983, the authorities approved 1,870 projects involving technical cooperation. Japan was the largest contributor with 65.6 percent, followed by the United States (with 21.4 percent). The countries of Europe and other countries together accounted for the remaining 13 percent. The authorities approved technical cooperation agreements as follows: electronics accounted for 25.2 percent of the total approvals; chemicals, 20.1 percent; machinery and equipment 15.5 percent and basic metals and metal products, 13.4 percent.

Public research institutes

The authorities have a number of research institutes that work with private firms to develop new products, search for and acquire new technology, and conduct research and development on processes and products for ultimate transfer to private enterprises. The most important laboratory, the Industrial Technology Research Institute (ITRI), was created in 1973 to develop and acquire key technologies in the electronics, energy, materials science, information, production automation, bioengineering, and food technology industries.

ITRI is an autonomous body with an annual budget of \$9 million, and it conducts some of the most advanced manufacturing research in Taiwan. All of its divisions cooperate closely with industry, undertaking R&D for manufacturers either on a straight fee or an equity sharing basis. ITRI has three major subsidiary laboratories: The Mechanical Industry Research Laboratories (MIRL); the Electronics Research and Service Organization (ERSO); and the Materials Research Laboratories (MRL).

Since 1982, ITRI has filed 32 patent applications, affected 67 technology transfers, rendered technical assistance on 77,363 occasions, and cooperated in product development with 373 firms. Among the projects ITRI was working on in 1983 were research on: integrated circuit technology, micro- and mini-computers, disc drives, high performance steel, horizontal machining centers, assembly and materials-handling robots, flexible manufacturing systems, fine denier polyester fiber, high speed spinning processes, plastics, high purity solvents for semiconductor processing, chemical vapor deposition coating, permalloys, combustion diesel engines for farm machinery, electronic ignitions, and turbochargers, and finally, improving technology for automobile and 2-stroke motorcycle engines.

Tax incentives

As mentioned previously, the authorities encourage local companies to purchase foreign technology by allowing deductions for royalty payments for the technology from income in Taiwan. Similarly, the income derived by a foreign company from licensing of technology, patents, and manufacturing processes to an enterprise in Taiwan is tax free.

R&D expenses are also wholly tax deductible for the year in which they are incurred; accelerated depreciation can be applied to instruments or equipment purchased for R&D by productive enterprises; and machinery and equipment imported for R&D purposes is exempt from import duties.

Restricted technology licensing

Foreign nationals wishing to sell trademarks, patent rights, or technical, administrative, or management services must file an application with the Ministry of Economic Affairs. The local company must also file an application. No royalties or service fees can be repatriated before approval is received from the Ministry. The Ministry attempts to keep the price of such technology low by reducing competition by Taiwan firms for such technology.

Cartel and Merger Policy

Taiwan has little in the way of formal antitrust regulations. There are no regulations concerning monopolies or antitrust in Taiwan, nor are there any restrictions or regulations concerning the acquisition of a local company by another local company. However, firms wishing to do business in most industries must first secure a license from the Ministry of Economic Affairs, which controls the issuance of licenses for new businesses and the transfer of licenses by existing businesses. The Ministry can use this opportunity to ensure that the transaction does not create a monopoly. Local trade unions can ask the Ministry to reject applications they feel will be damaging or unfair. When considering those appeals, the Ministry has wide discretion in deciding what situations to consider a threat to competition and is empowered to consider the benefits of the proposed action to the economy as a whole.

The authorities appear to be using a number of mechanisms to encourage large-scale enterprises at the expense of smaller firms. The tax rate for corporations is a full 10 percentage points less than the tax rate for unincorporated firms. Many tax incentives only apply to firms which have a certain scale of production or minimum paid-in capital. Furthermore, when a merger or consolidation has been approved by the appropriate authorities, the enterprises involved are exempt from income tax, stamp tax and title deed tax on income resulting from the merger or consolidation. However, most of the incentives offered by the Government to encourage mergers have been ignored. Tax incentives to encourage mergers, for example, were hardly used in 1983.

Foreign trading companies--primarily Japanese--handle about two-thirds of the value of Taiwan's trade transactions. In late 1977, the Taiwan authorities attempted to encourage the establishment of 5 large domestically-run trading companies to promote exports of Taiwan goods. The authorities encouraged this step because they wanted to introduce competition with the foreign trading companies and to expand foreign marketing channels for Taiwan goods. However, in their more than 5 years of existence, Taiwan's trading companies have been unable to pose significant competition for the foreign trading companies already operating in Taiwan.

In an attempt to help small manufacturers upgrade their production technology and management, the authorities has set up a "central satellite factory system." Under the system, small firms are to work with larger firms to standardize and organize the division of production in the industry. Factories qualified as satellites will be given assistance in automation, management, and finance. Nine industries have been selected to participate in the system: auto parts, plastics, rubber, iron and steel, machinery, electronics, sewing machines, motorcycles, sportswear, and toys. ^{1/}

Public monopolies control the supply of many basic materials in Taiwan, including aluminum and copper, steel, petrochemicals, ships, electric power, and transportation. Part of the impetus for creating State-run firms in these basic fields appears to be an unwillingness to allow private firms to

^{1/} "Plans Prepared for Establishing Central Satellite Factory System," The Free China Journal, March 25, 1984.

control distribution of these products. The Taiwan authorities appear to believe that should allocate these goods in accordance with the public interest. They are also concerned about the vulnerability of foreign supplies of these products and have used control over production of these goods in Taiwan to smooth prices changes.

The overall share of Taiwan government ownership of industry has declined over the past two decades because of the rapid growth of the private sector. Public companies's share of industrial production dropped steadily, from 56 percent in 1953 to 19 percent in 1982.

Targeting Techniques in Specific Taiwan Industries

Following are some case studies on industries that have been targeted for development in the 1980's by the Taiwan authorities.

Autos 1/

The automotive industry is to receive particular attention in Taiwan's industrial development program. However, a centrally-initiated cooperative venture with Toyota Motor Company, which had been the cornerpiece of the authorities' development strategy, recently fell through. Under this initiative, the Government, through the State-owned China Steel Corporation, had plans to invest more than half a billion dollars over the course of 10 years (1983-93) in a joint car venture with Japan's Toyota Motor Company.

As an alternative to the Toyota initiative, the authorities have proposed a plan to engender more competition in Taiwan's auto industry. Specifically, they proposed lowering tariffs and other barriers to imported cars and car parts to 30 percent (from 65 percent) over an 8 year period. They hope that by doing so Taiwan's existing car and car-parts makers will be forced to rationalize and combine their production facilities, making it possible to increase their sales in world markets for replacement car parts and original equipment from \$200 million in 1983 to \$2 billion by 1991.

Ford also recently announced that it plans to invest another \$40 million to double the output of its local subsidiary, Ford Lio Ho Motor Company and that it would export 30,000 cars a year by 1987. Ford will receive substantial tax and financial incentives for its investment. The authorities are also underwriting a cooperative venture between Japan's Hino truck company and Taiwan firms.

1/ Sources: "The Roadshow is Off," Far Eastern Economic Review, Sept. 27, 1984, p. 165., "The New World Carmakers," Far Eastern Economic Review, Apr. 5, 1984, p. 65-72, John Larson, "Competitive Trends in the World Automotive Industry," paper presented at the DRI International Outlook Conference, May 24, 1984; U.S. Department of Commerce, International Marketing Events, "Market Research Summary: Automotive Maintenance equipment and parts," May 1980.

The authorities' direct share of the now-defunct Toyota car venture was to be represented by China Steel's 25 percent interest. Private companies in Taiwan--Formosa Plastics, Taiwan Cement, Sharp, Tatung, and the Shin Kong, Cathay, and Wei Chuan groups--were to hold a 30 percent interest in the project, while Toyota was to hold the remaining 45 percent. The venture would have been capitalized at \$600 million by 1992. The venture was also to receive low interest loans from the authorities.

A preliminary agreement with Toyota was reached in December 1982, but after 2 years of tense negotiations, the two sides still could not agree on export levels and local content requirements. The Taiwan side insisted on three points: 50 percent of the plant's output would be exported, 90 percent of the parts would be procured in Taiwan, and substantial production technology would be transferred. It planned to hold Toyota to these requirements by adopting fixed timetables for achieving them and by refusing to allow Toyota to take profits from the venture if it failed to do so. Toyota feared that these requirements would be impossible to meet because parts from Taiwan's relatively small manufacturers cost between 20 and 60 percent more than those from Japan or the United States.

The six auto assembly companies already existing in Taiwan all produce under licensing agreements with foreign manufacturers. However, they are hobbled by high costs and a small domestic market--consumers in Taiwan purchased less than 150,000 cars in 1983.

The authorities had another major setback in their auto industry strategy, struggling for over 2 years to extricate themselves from a heavy truck project undertaken in cooperation with General Motors (GM) of the United States. GM withdrew from the project in mid-1982. Finally, in March 1984, the Government reached agreement with Hino Motor Company of Japan to take over GM's 45 percent stake in the project along with Mitsui and five local partners from the private sector. The five partners include Hotai Motor Corporation, local distributor for Hino trucks and Toyota automobiles, the Wei Chuan Group, and the China Development Corporation, a private investment and trust company partly funded by the authorities. The authorities are reported to have lost some \$22.5 million on the GM venture.

The joint venture with GM was intended to produce diesel trucks for both commercial and military use. The authorities had a 55 percent stake in the project, and GM held 45 percent of the venture, with a total investment by GM of \$35 million. The company was formed in 1980 with equity of \$23 million, it borrowed an additional \$41 million on concessionary terms. However, there soon emerged serious disagreement between the Government and GM over the size and level of sophistication of the trucks to be produced. Only 1,000 trucks were actually produced by the venture, and they were 60-90 percent more expensive than similar Japanese trucks, even given the relatively high 45 percent tariff assessed on them upon importation into Taiwan. As a result, the authorities imposed, at GM's request, a 2 year ban on imports of Japanese trucks. Nevertheless, GM pulled out of the venture in mid-1982, taking with it \$13.7 million of its original investment. The Japanese firm Hino sought, and originally got, a commitment by the authorities to keep the import ban in place. The authorities lifted the ban in early February 1984, however, because of domestic supply shortages.

Total investment in the Hino venture is to total \$67 million. Approximately \$36 million of that amount will be financed through local banks. Local content requirements will be 32 percent, but will slowly graduate upwards. Meanwhile, the Taiwan authorities have replaced their ban on imports with a tariff of 60 percent for the next 3 years, after which tariffs will fall to 45 percent over a 4 year period. Production at the plant is expected to reach 5,000 units by 1985 and 10,000 units by 1990.

Informatics

The Taiwan authorities are seeking to develop the informatics industry in the 1990's, focusing on computers and semiconductors, electronics, and telecommunications. Many of Taiwan's consumer electronics companies will take part in public projects in these fields. They will be joined, in some cases, by firms in the plastics, chemicals, and textiles industries, as those firms begin to emphasize engineering plastics and materials designed to meet the needs of the informatics industry.

Computers.--In the past 4 years, the Taiwan authorities have been actively promoting the domestic computer industry. They are concentrating their efforts in three areas: computer peripherals, software technology and applications. The ultimate goal is to upgrade the domestic consumer electronics industry. (see electronics, below)

The authorities' strategy for the industry involves virtually all the targeting tools within their reach. They will actively encourage foreign firms to invest in the Hsinchu Science-based Industrial Park, attracting them with substantial incentives. In turn, the firms will be asked to transfer technology developed in the home country to Taiwan, to conduct research on computer technology in Taiwan, to employ Taiwan nationals for this purpose, and to license technology developed in Taiwan to other firms. In many cases, they will work with public research laboratories on specific computer technologies. The authorities will favor domestically produced computers and related parts and peripherals in procurement decisions. They will lower import duties on parts and components of computers and peripherals. Firms that produce particular computer-related products will be eligible for special tax incentives and other benefits under the Statute for the Encouragement of Investment. 1/ Makers of such equipment will also be eligible for preferential loans from the Bank of Communications, The Export-Import Bank of China, and the Small- and Medium-Business Credit-Guarantee Fund. The Bank of Communications is also authorized to invest directly in a firm producing the favored products, providing up to 25 percent of the paid-in capital for the firm.

1/ Specifically, the Government is encouraging production of the following products: CRT terminals; low speed, nonimpact printers; raster scan graphics; medium speed printers; fixed disc drives; reel-to-reel magnetic tape drives; optical character readers; chinese and english word processors; microcomputers and minicomputers; modems; floppy disks; software; and, process control systems.

Taiwan spent \$3.84 million on computer-related R&D in 1979. An estimated 80 percent of that amount was provided by the central authorities, mainly through public research institutes. The Industrial Technology Research Institute's Electronics Research and Service Organization (ERSO) is the principal public research lab involved in computer-hardware-related research. ERSO spent approximately \$5 million on research in 1982, mainly on microcomputers and minicomputers, software, industrial process controls, testing, quality assurance, and product engineering. It often transfers new technology developed by it to private firms, sometimes at a fee. In addition to its own research, ERSO works with private manufacturers to develop new processes and products.

The Institute for the Information Industry (III) is a nonprofit, officially semi-sponsored organization responsible for development of computer software, hardware, and human resources. It serves as a bridge between the computer industry and users, education and research institutions, and authorities. III's tasks are to vigorously promote the efficient use of computers, to bring in advanced technologies, to promote software systems development, and to educate and train skilled manpower for the information industry.

Electronics.--Taiwan's electronics industry is dominated by foreign firms: table 90 indicates that about 70 percent of all Taiwan output is produced by foreign companies; over 70 percent of foreign company production is exported (Table 91). When domestic companies are taken into account, the ratio of exports to production is lowered to about 60 percent (Table 92).

Foreign direct investment in Taiwan's electronics industry totaled \$935.8 million in the 1952 to 1981 period. The United States was by far the largest investor, accounting for \$476.1 million, over one-half the total.

Table 90.--Taiwan: Share of foreign companies in Taiwan's electronics output, 1974-79

Year	Foreign company electronics goods output	Total electronics industry output	Foreign share of electronics output
	Million U.S. dollars		Percent
1974-----	1,151	1,642	70.1
1975-----	1,052	1,514	69.5
1976-----	1,455	1,997	72.9
1977-----	1,713	2,294	74.7
1978-----	2,409	3,307	72.8
1979-----	3,017	4,225	71.4

Source: American Institute in Taiwan, "Industrial Outlook Report: Electronic Products," CERP-0566, July 13, 1982.

Table 91.--Taiwan: Foreign company and total electronics exports, 1974-79

Year	Foreign company electronics exports	Total electronics industry exports	Foreign share of electronics exports
	-----Million U.S. dollars-----		Percent
1974-----	791 :	991 :	79.8
1975-----	665 :	741 :	89.7
1976-----	1,029 :	1,285 :	80.1
1977-----	1,170 :	1,487 :	78.7
1978-----	1,683 :	2,013 :	83.6
1979-----	2,004 :	2,640 :	75.9

Source: American Institute in Taiwan, "Industrial Outlook Report: Electronic Products," CERP-0566, July 13, 1982.

Table 92.--Taiwan: Exports as a share of electronics industry output, 1974-81

Year	Electronics industry output	Electronics industry exports	Exports as a share of total output
	-----Million U.S. dollars-----		Percent
1974-----	1,642 :	991 :	60.4
1975-----	1,514 :	741 :	48.9
1976-----	1,997 :	1,285 :	64.3
1977-----	2,294 :	1,487 :	77.9
1978-----	3,307 :	2,013 :	60.9
1979-----	4,225 :	2,640 :	62.5
1980-----	5,325 :	3,674 :	69.0
1981-----	5,632 :	4,170 :	74.0

Source: American Institute in Taiwan, "Industrial Outlook Report: Electronic Products," CERP-0566, July 13, 1982.

In 1983, the electronics industry surpassed textiles not only as Taiwan's leading export industry but also as its largest industrial sector (in terms of output, exports, employment, and investment.)

The United States is the leading market for Taiwan-made electronics goods, but most of those shipments are from U.S.-invested companies in Taiwan. Taiwan's leading electronics exports are thermionic valves, tubes, photocells, transistors, transistor radios, cassette recorders, black and white TV's, color televisions, electronic calculators, calculator components, and digital display watches. The United States took between one-fifth and three-fourths of Taiwan's exports of these items.

Components, most from Japan and the United States, account for the bulk (80 percent in 1980) of Taiwan's electronics imports. Taiwan's leading electronics imports are tape recorder parts, valve tube parts, integrated circuits, television parts, transistors, and semiconductor integrated circuits. Japan was the leading supplier, accounting for 54 percent of electronics imports in 1980, and the United States supplied another 27 percent.

Largely in response to major foreign direct investments, electronics production in Taiwan more than quadrupled between 1974 and 1981. Output increased at an average rate of 26 percent, compared with 12 percent growth rate in world output during the same period. The large-scale manufacture of sophisticated consumer and professional electronics products is replacing small, labor-intensive assembly operations which previously characterized Taiwan's electronics industry.

The number of firms in Taiwan also mushroomed, to nearly 2,000 by 1982 and over 90 percent of them were entirely Chinese-owned. On average, Chinese-owned firms were smaller than either totally foreign invested firms or joint ventures, with average employment by Taiwan companies of 93 persons. Foreign firms were much larger by comparison, with an average employment of 1,268 for American-invested firms, 646 for Japanese, 412 for Sino-Japanese and 161 for Sino-American firms.

The authorities have a 10-year development plan for the electronics industry. The goals of the plan are to increase value-added within the industry, upgrade domestic product development capability, reduce dependency on foreign marketing and distribution organizations, increase the proportion of domestically owned firms in the industry, move toward higher technology products, and reduce reliance on foreign sources for key components and raw materials.

To achieve these goals, the authorities are designating a number of electronics products as "strategic" products, making producers of those goods eligible for tax incentives, tariff rebates, preferential loans, and assistance by public research institutes. Tariffs will also be lowered on key inputs.

By official estimates, private firms spent just 0.9 percent of the total value of electronics production in Taiwan on R&D, far less than the 6-9 percent spent in other places where the electronics industry is more advanced. The authorities plan to use tax incentives to encourage private firms to spend 1.5 percent of the value of their production on R&D by 1985 and 3.0 percent by 1989. They will also use the ERSO to help electronics firms by developing new technology, acquiring it from foreign sources, and providing technical and information services.

The Taiwan authorities estimate that the electronics industry in Taiwan currently has a value-added ratio of 38 percent. Although this ratio is better than it is for other industries in Taiwan, it is far below that for the United States (57-61 percent), Japan (45-50 percent) and Europe (55-60 percent.) The authorities hope to increase the value-added ratio to 40 percent by 1989. Consumer electronics is slated to continue to account for the bulk of the electronics industry's output.

Semiconductors.--As part of its 10-year plan for the electronics industry, the Taiwan authorities are designating a number of semiconductor products as strategic, including many to be used in consumer electronics equipment. Major emphasis is being placed on the ICs and discretes for a variety of applications. Producers of those goods will therefore be eligible for official loans, duty rebates, and tax breaks. 1/

Telecommunications equipment.--Since the mid-1970's, Taiwan has invested heavily in the development of its telecommunications industry, emphasizing modernization of existing facilities and upgrading both international and domestic communications networks. Although Taiwan's production capabilities are currently confined to lower technology equipment, it has become a major supplier of consumer goods, such as telephone sets. Taiwan is still heavily dependent on the United States and Japan for most of its sophisticated telecommunications equipment needs.

At the present time, Taiwan's telecommunications industry produces products at the low end of the technology spectrum such as telephones, switchboards, interphones, and walkie-talkies. In 1983, the U.S. purchased about \$371 million in telecommunications equipment from Taiwan, mainly telephone instruments (\$143 million) and cordless handset telephones (\$123 million). At the end of 1982, there were 1,193 telecommunications manufacturing firms in Taiwan.

The Taiwan authorities are encouraging the telecommunications sector as part of its electronics industry plan. Producers of a number of products will be eligible for marketing, taxation, and financing assistance. 2/ The industry is to receive a total of \$70 million for research and development over the course of the 1982-92 period. The authorities have also set up a marketing information center to act as a clearinghouse for the industry in Taiwan. It has provided electronics firms with credit-guarantee services from the Small- and Medium-Business Credit-Guarantee Fund; encouraged local leasing companies to give top priority to providing the industry with leasing services; and favored local producers in public procurement. (Public procurement accounts for 90 percent of telecommunications consumption in Taiwan.)

1/ The products are: ICs and discretes for TV, video disc players, and home appliances; ICs and discretes for LCD; special applications linear ICs such as data acquisition or telecommunications; signal processing ICs; second source of microprocessors; custom ICs and facility servicing; speech processing ICs; removable bubble memory; photovoltaic arrays; power FETs; ICs and discretes for control modules; RAM and ROM semiconductors; and, photo SCRs.

2/ The telecommunications products which qualify for special encouragement under the Statute for Encouragement of Investment are: digital central office switching equipment; digital PBX key system switching equipment; cable TV; time division digital multiplexing equipment; digital microwave radios; frequency division multiplex - analog; mobile radio - VHF/UHF system; broadcast equipment including view data and video information; satellite earth station equipment; and, digital telephone instrumentation; modems; optical communication equipment.

Although they wish to encourage local manufacturers, the authorities have in the past procured most of their sophisticated telecommunications equipment from the United States and Japan. Other tariff and nontariff barriers to telecommunications imports are minor.

Machine tools and robotics

The Taiwan authorities are trying to steer the domestic machine tool industry into production of higher technology goods, such as numerically controlled machine tools. According to plans for the industry, production of metalworking machine tools will grow at an annual rate of 17 percent from 1983 to 1986 and at an annual rate of 14-15 percent during 1986-90. Output of numerically controlled machine tools is projected to increase by 50 percent annually. The authorities are also seeking to increase the share of domestic consumption accounted for by locally made metalworking machine tools, from the present 60 percent to 70 percent in 1986 and 80 percent in 1990. Exports of metalworking machine tools are to grow 15 percent a year, with most still going to industrial countries, particularly the United States. In fact, nearly one-half of Taiwan's machine tools are expected to be destined for the U.S. market.

The Taiwan authorities have designated 53 automatic industrial tools that qualify for the benefits outlined in the Statute for Encouragement of Investment. ^{1/} Both imported and domestically made goods qualify under the Statute, but manufacturers purchasing imported goods reportedly will receive a 10 percent, rather than 15 percent, writeoff.

In 1982, the authorities encouraged 14 machine tool manufacturers to form the Taiwan Machinery Association in an effort to raise the technical quality of the member firms' output. The association has worked to create uniform standards for machine tools in Taiwan and has conducted research on standardizing certain parts of machine tools. The authorities will also seek to reduce imports by refusing to grant import licenses for machine tools if a comparable product is available domestically.

Over the past few years, the Taiwan authorities have used a number of measures to promote the machine tool industry, including loans for capital investment, tax incentives, support and funding for research and development, and encouragement of cooperation among Taiwan machine tool builders.

^{1/} Included in the items are: computerized numerical control (CNC) machine tools; direct NC (DNC) machining cells; industrial robots for loading and unloading, welding, painting and assembling; intelligence robots with sensory systems; automatic special use machinery; tri-dimension measuring instruments; electro-magnetic clutches; DC/AC spindle motors; stepping motors; sensor and monitor systems; servo control systems; self-testing alarm systems; adapters; DC service motors; flexible manufacturing systems; automated warehouses and carriers; ultra-high speed spindles and bearings; ball screws; high efficiency conveyer belts; automatic clamping tools; lasers; low-noise pneumatic and hydraulic devices; automatic tool change storage; CNC controllers; programmable logical controllers.

In July 1977, the Metal Industry Research Laboratory of ITRI established a Machine Tools Center to conduct research on machine tools. Technology developed by MIRL is frequently transferred to domestic producers. In June 1983, MIRL licensed technology to several private firms for an FMS station that can accommodate 10 machines and up to 24 loading/unloading stations. Another machine tool manufacturer, Lian Feng Machine Industries, is now producing a horizontal machining center which was developed by MIRL. 1/

Although no private firms in Taiwan are currently selling industrial robots, the Industrial Technology Research Institute has been working on robot technology since 1981. In that year, ITRI licensed robot technology from the Unimation Company of the United States. It adapted the technology, and by the end of 1981, it had created the ITRI-E type assembly robot, at a total cost of \$375,000 (not including license fees). No private firms have licensed robot technology from ITRI, but two private robot manufacturers have developed prototype robots on their own for ultimate use in their production lines.

Petrochemicals 2/

The development of the petrochemical industry was given top priority in the mid-1970's. As one of the 10 major development projects, the authorities invested heavily in petrochemical feedstock production facilities in the State-owned Chinese Petroleum Corporation (CPC). The industry prospered until the 1979 oil price shock, partly because of protection afforded it by the authorities from competing petrochemical feedstocks. During the mid to late 1970's, domestically produced midstream products increasingly displaced imported goods. However, the oil price increases and global recession that followed caused the industry and its major customers, the textiles and plastics industries, to suffer.

During the 1970's, CPC built several naptha cracker facilities to produce ethylene, propylene, and butadiene as well as several aromatic units to produce benzene, toluene, and xylene. In addition, the Chinese Petrochemical Development Corporation, a wholly owned subsidiary of CPC, set up facilities to produce dimethyl terephthalate.

The authorities also encouraged foreign and domestic investment in petrochemical facilities to serve Taiwan's already well-developed plastics, textiles, and fiber industries. A number of U.S. firms set up joint ventures with Taiwan firms in the petrochemical industry, generally involving substantial technology transfer, in order to obtain access to the protected Taiwan market.

1/ "FMS Displayed at Taiwan Show," American Machinist, June 1983, p. 33.

2/ Principal source: American Institute in Taiwan, AITGRAM No. A-034, May 31, 1982.

This protection took several forms. The authorities promulgated regulations to control the import of chemical commodities. The authorities also required midstream companies to purchase at least 70 percent of their feedstocks from the CPC in order to maintain demand for CPC-supplied basic feedstocks. Finally, to protect the midstream firms, the authorities required end users in the plastics and textiles industries to purchase a certain percentage of their products from the favored midstream firms. Both import permits and export licenses were required, giving the authorities a mechanism to keep domestic manufacturers in line.

However, by 1979, Taiwan's petrochemical producers were rapidly losing competitiveness in world markets because they were unable to import lower cost feedstocks. At the same time, worldwide overcapacity and declining demand were causing world petrochemical prices to plummet, making it increasingly difficult for Taiwan's midstream firms to compete. Because they were forced to buy relatively more expensive midstream products, Taiwan's plastics and textiles manufacturers--two of Taiwan's leading exporting industries--began to lose their edge in global markets.

Faced with substantial pressure by the two end users, the Executive Yuan adopted a policy in October 1981 to deal with the problems of the petrochemical industry. It represented a complete reversal of previous policy, calling for an immediate adjustment of basic feedstock and midstream petrochemical prices to world levels. Almost all import restrictions on petrochemicals were lifted. At the same time, the Executive Yuan drafted new antidumping and countervailing duty rules to police imports sold at prices below world levels.

Mid-stream petrochemical producers quickly criticized the plan, noting that the CPC had not lowered feedstock prices sufficiently to allow them to compete in an open market. In response to this pressure, the Ministry of Economic Affairs announced that it was further lowering the prices of CPC products by tying them to prices of U.S.-made products. Nevertheless, several mid-stream firms were experiencing financial difficulty. Oriental Union Chemical Corporation ceased operations, while a Union Carbide joint venture was bought out. In response to pressures from midstream companies, the authorities imposed a ban on plastic scrap imports in 1982.

In November 1984, CPC decided to invest \$200 million to build a fifth naptha cracking (olefin) plant. Construction of the plant is to begin in July 1986 and to be completed by 1990. When completed, CPC has indicated that it might close the first and second naptha cracking units. The newly built plant will be able to produce 400,000 metric tons of ethylene, 220,000 metric tons of propylene, 60,000 metric tons of butadiene and 170,000 metric tons of aromatics per year.

Pharmaceuticals

Production of pharmaceuticals in Taiwan is growing steadily, but most Taiwan manufacturers now process drugs developed by foreign pharmaceutical companies, rather than manufacture them completely. Quality products must be imported to meet local needs. Authorities in Taiwan are intent upon upgrading local facilities for drug manufacture in an effort to increase the production and quality of locally made pharmaceuticals.

There are currently 841 producers of human drugs and 118 producers of veterinary drugs on the island. About one-half of veterinary drugs makers also produce medicines for human use. Most Taiwan drug producers are small- or medium-scale family-run businesses. Nearly 60 percent of human-drug producers have capitalization below \$25,001, and the capacity utilization rate averages 40 percent. As of April 1983, Taiwan companies had 21 joint ventures with foreign pharmaceutical companies, 8 of them with U.S.-based firms. ^{1/} These joint ventures accounted for approximately one-third of Taiwan's pharmaceutical sales.

As part of a new industrial strategy for the pharmaceutical industry, on January 1, 1983 Taiwan officials adopted the system of Goods Manufacturing Practices (GMP), which is a set of guidelines for the safe production of quality drugs used by drug manufacturers world wide. Drug producers are now required to submit comprehensive documentation to the Ministry of Health--including specifications, methods of analysis, and ingredients of finished products--in order to obtain premarket approval. In addition, an import policy of "one drug, one license" has been implemented. Imports of drugs that are already registered by qualified Taiwan enterprises will be banned, except for those requiring special manufacturing techniques. Imports of chemical raw materials are being encouraged to accelerate the development of the pharmaceutical industry.

The Taiwan authorities adopted the GMP standards as part of a program to upgrade the quality of domestically produced drugs. All pharmaceutical establishments in Taiwan must fully comply with GMP guidelines before May 26, 1987; otherwise, they will not be permitted to renew their drug licenses. Firms that are registered with the authorities must complete a Master Production and Control Record for registered drugs before November 26, 1984; otherwise, they will not be eligible to apply to register additional products.

A number of tentative steps designed to stimulate investment and to help Taiwan firms accomplish the goals set out by the authorities have been announced by the Ministry of Economic Affairs. These steps will encourage the merger of firms which now do not meet GMP requirements. The merged firms will be able to enjoy benefits under the Statute for Encouragement of Investment. Firms which cannot comply with GMP guidelines before May 26, 1987 will be allowed to license their technology to firms that have already met GMP requirements. Public hospitals are encouraged to buy the products of qualified GMP firms.

The authorities in Taiwan are anxious to promote cooperation and possible technology transfers between the brand-name drug producers in developed countries and Taiwan producers; joint ventures that meet the GMP requirements are eligible for 5-year loans.

Several public institutes engage in the research and development of pharmaceutical products, including the Combined Industrial Organization, ITRI, National Science Council, Central Research Institute, National Taiwan Normal University, and National Defense Medical Center.

^{1/} Pfizer, Ltd.; Sterling Products International, Inc.; Vamont, Inc.; Parke Davis Corp.; Bristol Industries, Ltd.; Upjohn Laboratories, Ltd., Eli Lilly & Co., and Cyanamid Taiwan Corporation.

A task force has been created to assist veterinary drug manufacturers meet GMP standards. The task force provides training sessions and invites specialists from foreign countries to advise local manufacturers on how to implement and adhere to the GMP system.

Annual expenditure for the GMP task force is appropriated by the Budget for Integrated Promotion Program of Sciences and Technology. The 1982 expenditure for the GMP task forces was approximately \$5,135,447. The budget for 1983 is estimated at \$4,878,675; and for 1984 the budget will be \$5,795,400.

In addition to promoting the GMP system, the Taiwan authorities have also called for the development of the chemical raw materials industry. Current efforts in this area are focusing on developing anticancers, contraceptive preparations, and other high-value added products. In 1982, the Ministry of Economic Affairs appropriated \$205,418 to the National Science Council to develop chemical raw materials. The 1983 budget is estimated to be \$256,772.

Despite official encouragement, local producers do not believe they can implement the GMP program effectively within 5 years. Budget appropriations are not high, and must be divided among large numbers of small-scale producers. Furthermore, the prerequisites for developing a sophisticated pharmaceutical industry are not in place. Related products, such as raw materials, apparatus, and containers for marketing are in short supply, making it difficult to achieve the necessary quality controls, as well as the packaging and labeling specifications demanded by the GMP regulations. The technicians needed to perform the required record keeping and quality control are also in short supply.

Shipbuilding

In an effort to build all Taiwan-flag shipping vessels domestically, Taiwan put shipbuilding and expansion of dry dock facilities near the top of its list of industrial priorities in the 1970's. As the cornerstone for its development strategy, the authorities built a new one million ton dry dock facility in the 1970's. By 1982, Taiwan was the third largest shipbuilder in Asia, second only to Japan and Korea.

As in other basic industries, direct participation by the authorities is heavy. The largest shipbuilding company on the island, the China Shipbuilding Corporation, is State run. It produces and repairs ships, along with manufacturing ship machinery and steel. It also constructs whole plants for making fertilizer, petrochemicals, paper, pulp, and steel. China Shipbuilding's two major plants, Kaohsiung and Keelung, are modern and efficient.

As part of an effort to move into specialty shipbuilding, the Corporation is developing the capacity to build LNG and LPG carrier ships. The authorities hope to supply these ships to Japanese and other petrochemical producers. The China Shipbuilding Corporation just won a contract to build a specialized ship to carry petrochemicals with the help of Norwegian consultants, further moving Taiwan into the area of specialty ship production. This contract, as well as modern facilities, is expected to keep

China Shipbuilding healthy, despite mixed results by the shipping industry itself. Unfortunately, the same cannot be said of the Eddie Steamship company, a major Taiwan carrier. World-wide overproduction, lower shipping prices and bad management put the company \$230 million in arrears to mostly American banks.

After much disagreement, bureaucrats worked out a deal to save Eddie. Under the terms of the agreement announced on August 31, 1984, the publicly-owned Taiwan Power Corporation is to pay Eddie monthly installments of about US\$1 million, equal to a premium of \$3 per ton of coal Eddie ships for Taipower. In return, Taipower will get \$3 million worth of China Shipbuilding Corporation shares owned by Eddie and second mortgages on seven of Eddie's ships, valued at about \$15 million.

The total of \$18 million supplied by Taipower will help Eddie pay off \$15 million it owes to fuel suppliers and other trade creditors and some \$3 million in unpaid wages to staff and crew. Nevertheless, a bureaucratic consensus to save Eddie has not developed, as witnessed by the cancellation by State-owned China Steel Corporation of Eddie's contract with it to ship iron ore. The Evergreen Marine Corporation, another Taiwan shipping company, which is scheduled to inaugurate around-the-world container services in 1985, won all of China Steel's shipping contracts from Eddie in mid 1984.

Steel

Essentially starting from scratch, Taiwan appears to be developing an efficient and rather substantial steel industry. Taiwan has accomplished this growth largely through the State-owned China Steel Corporation (CSC) which benefits from direct investment by the authorities and a wide range of tax and fiscal incentives.

Originally a private company, The China Steel Corporation became publicly-owned in 1971 when Voest-Alpine, an Austrian steel maker, pulled out from the massive project, and private domestic investors could not be found. The authorities took over the company and adopted an ambitious, 4-phase development strategy. CSC was to concentrate on ordinary and high quality products, while the smaller companies in Taiwan were to produce light products and specialty steel.

CSC and smaller producers benefit from a variety of public assistance programs. The industry has benefitted from major improvements in infrastructure, such as the upgrading of Kaohsiung harbor where CSC has its main plant and the modernization of container ships that carry raw materials to its plants. In addition to receiving direct funding from the authorities, CSC is eligible for preferential loans from domestic commercial banks, either in the form of below-market loans made possible by central refinancing or foreign loans secured with the help of the authorities. Both CSC and smaller firms are exempt from import duties, harbor duties, stamp taxes, sales taxes, and education taxes on revenue generated by export sales and are eligible for investment tax credits on new equipment.

All of China Steel's production facilities have been installed on schedule. Phase I of China Steel's four-phase expansion plan was completed in December 1978. Construction of basic mills was completed and equipment installed to produce plate, rods, and bars. Phase II was begun in June 1982

and commercial operations of the new facilities began in July 1984. In Phase II, hot and cold rolled finishing facilities were set up and cold reduction capability installed. China Steel became a producer of hot and cold rolled sheet and coils, with annual production estimated to reach 3.25 million metric tons in 1984, most used by Taiwan's machinery, appliance, and auto manufacturers.

Construction of Phase III facilities began in July 1984 and is expected to be completed by June 1988. In Phase III, facilities to produce higher quality processed steel will be installed and total output increased to 5.65 million metric tons each year. When Phase III is completed, CSC will be among the 30 top steel manufacturers in the world. Phase IV will boost capacity to about 8 million metric tons while other domestic makers are expected to have a capacity of 3 million metric tons. Steel will then account for about 10 percent of industrial output in Taiwan.

About one-half of Taiwan's steel is consumed domestically, with the steel piping industry accounting for 16.5 percent of consumption; hardware, 17 percent; steel wire and cable, 16.5 percent; shipbuilding, 11.3 percent; foundry, 8.4 percent; bolts and nuts, 7.7 percent; machinery, 5.5 percent; construction, 4.2 percent and all others, 12.2 percent. Future production increases are to be directed to Southeast Asia, the Middle East, Japan and other markets. Taiwan's steel shipments to the United States are minor and have fallen from their peak in 1978. A major reason for this decrease is the 1978 dumping finding on carbon steel plate which assessed two firms antidumping duties of 43.7 percent and 38.5 percent and 9.7 percent for all other firms (CSC was not among the firms to be assessed).

Given the painstaking efforts of the authorities to build a steel industry, it is surprising that very little is being done to protect it in its infancy. Although licenses to import steel are required, they are generally easily secured. Tariffs on steel range from 10-15 percent, well below Taiwan's average duty rate of 30 percent. The Board of Foreign Trade does require that certain products be purchased from China Steel as long as it is able to meet domestic demand. However, many of these items have already been imported, including bars and rods of high carbon tool steel, bars and rods of alloy tool steel and wire rod of high carbon tool steel. Indeed, even though Phase I and II have been completed, imports from both the United States and Japan have increased. Imports from the United States rose from \$218 million to \$267 million and imports from Japan climbed from \$166 million to \$333 from 1977 to 1984. Government officials hope to slash these figures as Phase III comes on line.

China Steel relies heavily on foreign and domestic debt to underwrite its investment projects, most of which is provided on concessional terms (for example, U.S. and Japan Export-Import Bank loans). Yet even with its large debt burden, the company has only lost money in one quarter since 1978. It lost about \$20 million in the second half of 1982 because of the recession. Taiwan's success has not gone unnoticed by her neighbors. Japanese producers are concerned about increasing steel imports from Taiwan: in 1983, Taiwan shipped 533 thousand net tons of steel to Japan and in the first 8 months of 1984, Taiwan's exports were up 26 percent from the same period in 1983.

Taiwan supplied 17.6 percent of Japan's steel imports in 1983, up from 14.7 percent in 1982. Taiwan is Japan's second leading supplier of steel, after Korea. Korea shipped about three times as much--1.69 million net tons--as Taiwan did to Japan in 1983. 1/

China Steel has had some difficulties, however. Because of the importance of steel to Taiwan's economy, the authorities have heavily regulated prices set by CSC and often refused to allow it to raise prices. This could ultimately tame the nation's steelmaking ambitions, since CSC has had to absorb labor-cost increases in excess of 20 percent annually as well as price rises in raw materials. Depressed world prices for steel have also crimped CSC's earnings.

Textiles and apparel 2/

Textiles were Taiwan's leading export from the mid-1960's until 1982, when electronics took the lead. 3/ Today, Taiwan is one of the world's leading textile and apparel producers. Though it is made up entirely of private firms, the authorities have had a substantial influence on its development. Imports have generally been restricted by both import licensing and high tariffs. Tariffs on textiles and apparel range from 35 to 100 percent, with most tariffs in the higher end of this scale.

Imports have been allowed only when Taiwan producers were operating at full capacity, special items were needed, or domestic consumption was too small to justify local manufacturing. The authorities have also allowed a product to be imported if its price is significantly lower than that of the domestically produced good, and its importation was essential to another export industry in Taiwan. For example, if spun acrylic yarn was available in the world market at a much lower price, the authorities would allow sweater manufacturers to import the less expensive yarn.

Textile and apparel plants are located primarily in the three designated export-processing zones. Manufacturers located in those zones can import needed raw materials, intermediate goods, and machinery duty free. Additionally, sales and commodity taxes are waived permanently, while business income tax can be deferred for up to nine years.

Mergers have been encouraged by the authorities because they believe that larger companies enjoy economies of scale in the world market for textiles. Despite an increase in the number of mergers, the total number of companies in the textile and apparel industry grew from 1,575 in 1970 to 2,255 in 1981.

1/ Japan Steel Information Center, "Background on U.S.-Japan Steel Trade Issues," October 1984.

2/ Principal source: U.S. Department of Commerce, Country Market Survey, Textiles: Taiwan, May 1980 and U.S. Department of Commerce, Country Market Survey, Apparel, January 1980.

3/ Business America, July 23, 1984, p. 32.

The authorities have used various means to induce manufacturers to produce a narrow range of products that incorporate the most local value-added. For instance, export permits and membership in export trading associations is restricted by the authorities to firms which they feel are "behaving." They also takes steps to encourage mergers and avoid domestic competition in international commerce. Furthermore, funding for export sales, promotion, and assistance is channeled through the centrally-run Council for External Trade Development.

In the apparel sector, the authorities and industry have agreed that the industry should focus on high-quality and high-priced lines in order to maximize profits under widespread quotas by industrialized countries on apparel imports from Taiwan.

Targets for growth in textile and apparel production are specified in official economic plans, which also project export levels. All expansion plans in physical plant must have official approval before construction begins. The authorities weigh the company's export performance when reviewing private investment proposals.

Aircraft and Aerospace

Description and uses

Aircraft are defined as machines or devices supported by buoyancy or dynamic action, capable of atmospheric flight. Included in this grouping are kites, balloons, gliders, airplanes, helicopters, and parts for each of these products. Spacecraft are structures capable of leaving the earth and its atmosphere to perform a specific mission in space. Included in this category are satellites, space vehicles, and launch vehicles.

U.S. industry profile

It is estimated that 1,280 establishments produced aircraft, spacecraft, and parts in 1982. Production is generally concentrated in the following States: California, Kansas, Texas, and Washington. The top four manufacturers accounted for an estimated 61 percent of domestic shipments in 1982. ^{1/} The majority of aerospace products are sold directly from the manufacturer to the end user, although for small airplanes, balloons, kites, and gliders, a dealer/distributor network is used to market the product.

Wide fluctuations in employment are quite common, principally due to cyclical demand for aerospace products. The U.S. industry mainly employs skilled labor. According to industry data, employment in the aerospace industry increased during 1954-72. The majority of these workers were employed in the production of military aircraft which was used in both the Korean and Vietnam Wars. Employment declined significantly in 1977 due to reduced shipments of military and commercial aircraft. During 1978-81, employment trended upward, as new generation civil aircraft production was undertaken and military aircraft shipments increased, but declined in 1982. The reduction in employment in the aerospace industry in 1982 reflects decreased civil aircraft orders due to the depressed financial condition of the world's airline industry and increased competition from abroad.

To the extent that any loss of domestic and/or international market share results from targeting practices, the corresponding absence of each \$1 million in production not undertaken by U.S. aircraft and aerospace manufacturers would translate into an estimated 28 workers displaced in all sectors of the U.S. economy (based on 1982 production/employment relationships,) according to the staff of the U.S. International Trade Commission, using the Bureau of Labor Statistics' input-output model as shown in the following tabulation:

^{1/} U.S. Department of Commerce, U.S. Industrial Outlook, 1983, p. 31.

Industry sector	Displaced employment
	<u>Number</u>
Aircraft-----	14
Other manufacturing-----	6
All other-----	8
Total <u>1/</u> -----	28

1/ Aerospace is not represented in these figures.

Foreign industry profile

Canada.---The Canadian industry is currently one of the leaders in the Western aerospace industry, occupying fifth place behind the United States, the United Kingdom, France and West Germany. 1/ The industry produces executive and commuter aircraft, military aircraft, engines, aircraft parts, satellites, and unmanned surveillance vehicles. There are also a large number of firms engaged in the repair, modification, and overhaul of aircraft and systems. Additionally, a large number of these firms are subsidiaries of American parents. 2/ However, the two airframe producers dominate the Canadian aerospace industry. These two firms were brought under State control in the mid 1970's. More recently, they have been taken over by a State holding company, Canadian Development Investment Corporation (CDIC), which currently controls their operations.

The Canadian industry has grown considerably from 1963 to 1982. Total sales rose from \$509 million in 1963 to \$2.3 billion in 1982. The following tabulation shows estimated Canadian sales of aircraft, by type, during the period (in millions of dollars): 3/

Year	Commercial and civil	Military	Total
1963-----	173	336	509
1967-----	290	339	629
1972-----	408	220	628
1977-----	521	347	868
1978-----	610	358	968
1979-----	979	440	1,419
1980-----	1,426	403	1,829
1981-----	1,729	471	2,200
1982-----	1,599	653	2,252

1/ "Canada Aerospace '83," Aviation Week & Space Technology, Apr. 18, 1983, p. 99.

2/ "The Canadian Aerospace Industry", Interavia, June 1983, p. 618.

3/ "Canadian Aerospace Industry Statistics," Government of Canada, Industry Trade And Commerce Division, 1983.

According to sources in the Canadian industry, sales are forecast to reach \$6 billion by 1987. Employment data during 1963-1982 for the aerospace sector in Canada are shown in the following tabulation:

<u>Year</u>	<u>Number of employees</u>
1963-----	37,500
1967-----	48,100
1972-----	28,800
1977-----	28,900
1978-----	33,800
1979-----	39,300
1980-----	43,000
1981-----	41,000
1982-----	36,320

Employment is forecast to increase to 44,303 persons by 1987. 1/

According to Canadian sources, the industry seeks to develop and maintain a base of advanced aerospace technology, which generates continuing and high levels of economic return. Industry officials indicate that this can be accomplished because of an overall confidence in aerospace as a growth industry for Canada and the perceived large market potential for currently-produced Canadian aircraft products. 2/ In this regard, new capital expenditures for the Canadian aerospace industry have grown almost tenfold during 1979-82 (data for 1963 and 1967 are not available). The industry's capital expenditures are shown in the following tabulation (in millions of dollars): 3/

<u>Year</u>	<u>Capital expenditures</u>
1972-----	10.3
1977-----	20.3
1978-----	16.9
1979-----	57.4
1980-----	101.3
1981-----	120.8
1982-----	113.5

The Canadian industry participates in a number of international coproduction programs, chiefly with the United States, in both military and civil aircraft. One reason for the Canadian industry's growth has been the Government's success in bargaining on offsets so that the industry can share in the manufacture of aerospace equipment that the Government buys. The Canadians have been very effective in this area with regard to their military procurement from the United States where, in two cases, over 100 percent of the purchase price in promised business for the Canadian industry was negotiated.

1/ Ibid.

2/ "Canada Aerospace '83," Aviation Week and Space Technology, April 18, 1983, p. 100.

3/ "Canadian Aerospace Industry Statistics," Government of Canada, Industry Trade and Commerce Division, 1983, and "Canadian Aerospace Industry and Business Forecast Enquiry Report," Government of Canada, Industry Trade and Commerce Division, May 25, 1983, p. 3.

Additionally, the industry is seeking to expand into new areas. In 1983, Canada announced that it had reached agreement with a large U.S. helicopter manufacturer to set up an indigenous helicopter industry. According to industry sources, Canada is the second largest helicopter market in the West and, in the past, has had to meet its needs entirely with imports. With aid from the Canadian Federal Government and the Province of Quebec, the new facility is to be constructed near Montreal. The Canadian Government has also indicated that it will contribute to the development costs of the helicopter which is to be produced at the facility. 1/

Canada is also a participant in the world market for space products. This segment of the Canadian aerospace industry began with production of transponders and has progressed to the integration of complete satellites. The industry launched the world's first domestic communications satellite in 1972. Industry sources indicate that the progress of the Canadian space sector has been due, in large part, to its participation as a subcontractor in many international programs. 2/ However, Canadian officials estimate that there are less than 1,000 persons currently employed in this subsection of the Canadian aerospace industry.

Brazil.---Prior to 1941, Brazil was almost completely dependent upon outside sources for aircraft and equipment. In 1941, the Ministry of Aeronautics was created to place the country's military and civil aviation programs under one organization. Following World War II, the industry's main production effort was centered on modest efforts to build trainers and other aircraft under license from outside manufacturers. However, Government officials felt that the nation's technical resources were not being expanded sufficiently for its long term goals. 3/ The problem of a small domestic market, lack of a technical base, and a general lack of competitiveness in foreign markets, prevented successful trainer production without some degree of Government subsidization. 4/ The Ministry decided, therefore, to establish at San Jose Dos Campos Brazil's own Aeronautical Technical Center (CTA), which was similar in purpose to the U.S. National Aeronautics and Space Administration, and an associated engineering school, the Instituto Tecnologico de Aeronautica (Institute of Aeronautical Technology) (ITA). 5/ In the 1960's Brazilian civil aircraft manufacturing was confined to two small private companies mainly concerned with trainer aircraft. In 1969, Brazil, with the help of the Brazilian Federal Government and the United Nations Development Program, under the technical guidance of the U.S. Federal Aviation Administration, organized the beginnings of its current aircraft industry. The first step was the creation of a quasi-private/government entity that would design and manufacture aircraft for specialized airlift, air taxi, and commuter airlines use. To gain experience, a license agreement was signed to allow this Brazilian firm to build and market five designs of a U.S.-based general aviation manufacturer. In order to allow the firm to grow, the Government of Brazil imposed various tariff and non-tariff barriers, virtually closing the market to foreign suppliers. 6/

1/ "Canada Has Chosen Bell," Interavia, November 1983, p. 1153.

2/ "Space Sector Activities," Interavia, June 1983, p. 618.

3/ "Embraer: Doing What Could Not Be Done," Commuter Air, October 1981, p. 46.

4/ Embraer, General information-Brazilian Aeronautical Industry, 1983, p. 7.

5/ Op. cit., Commuter Air, 1981, p. 46.

6/ Alan Bramson, "Embraer," Pilot, June 1981, p. 39.

According to industry sources, Brazil's aeronautical industry currently includes one airplane manufacturer, four major aerospace component manufacturers, one helicopter manufacturer, and one glider manufacturer, which together employ over 6,000 persons. In addition, it is estimated that approximately 300 companies produce aviation equipment and parts. These firms employ an estimated 10,000 persons.

The leading aircraft manufacturer produces approximately 11 types of aircraft in different versions. The helicopter operation is a joint venture, 45 percent of which is owned by a French aerospace producer, 20 percent by the Brazilian Air Ministry, 17 percent by the Brazilian Navy, and the remaining 18 percent by the Government of the State of Minas Gerais. This firm assembles French-built helicopters. In regard to military aircraft equipment, the Brazilian armed forces have, during the period under study, directed their principal suppliers to pursue research in missile production, aviation equipment, and naval construction. The aviation equipment programs have included engines, ballons, airport radar, altimeters, transceivers, flight protection systems, wheels, and braking systems. 1/

Brazilian domestic production of total aviation equipment is shown in the following tabulation (in million of dollars): 2/

<u>Year</u>	<u>Production</u>
1977-----	135.2
1978-----	161.0
1979-----	221.5
1980-----	227.5

Mostly recently, the largest Brazilian aircraft manufacturer teamed up with a U.S.-based helicopter manufacturer for the possible development of a new helicopter (for both civil and military applications) to be produced in Brazil in the next 5 years. An agreement for the transfer of technology involved in the design and manufacture of composite parts was signed in 1983. According to industry sources, the Brazilian firm intends to start with the building of composite materials for their own use, then move into the integration of avionics and basic systems for certain helicopter models, and later participate in the design and manufacture of the new helicopter. 3/

Brazilian space activities are controlled by two organizations under CTA; the Space Activity Institute (IAE) and the Instituto Nacional de Pesquisa (INPE). The IAE was formed to carry out research and development on the launching of space vehicles, as well as research on air-to-air missiles. An allocation of approximately \$20 million has been made for this institute for fiscal year 1984. The INPE, located at Totoia, is responsible for development of Brazilian satellite and earth research. 4/

1/ Department of Commerce, "Aviation Equipment Report", February 1981, pp. 15-17.

2/ Ibid. Data are not available for 1981 and 1982.

3/ "Brazil Considers Joint Helicopter Efforts," Aviation Week and Space Technology, May 7, 1984.

4/ "Monitoring of Foreign Industry Targeting Practices-Brazil," Government of Brazil, September 1984.

U.S. market

The largest share of the domestic market for aircraft and spacecraft is made up of commercial users; the remainder consists of U.S. Government divisions and private individuals. According to industry sources, the United States is one of the world's largest markets for aircraft. In 1981 (the latest year for which complete data are available), there were an estimated 241,656 aircraft and spacecraft in use in the United States. 1/ The vast majority are planes used by U.S. commercial airlines.

Under the Airline Deregulation Act of 1978, the view of mass air transit, as a public utility requiring Government regulation, was renounced in favor of free-market economics. The reasoning was that a more competitive environment in the airline industry would lower fares and improve service. 2/ Deregulation allowed U.S. carriers to freely enter new markets or exit those which were no longer profitable. The deregulation of the airline industry was also beneficial to equipment manufacturers, because as new routes were opened up, orders for aircraft increased. Open price competition and fare wars also increased the demand for airline seats, creating a demand for new aircraft. 3/

The early 1980's represent the third re-equipment cycle for U.S. airlines. Beginning with the first equipment cycle, which commenced with the advent of the commercial jet transport in the late 1950's, each generation embodied new technology responsive to economic pressures. The first was a response to the demand for long-distance, fast, and comfortable transportation. The second generation, which encompassed the development and sale of the wide-bodied "jumbo-jets" (mid-1960's) emerged as a response to the growth in demand for passenger-mile capacity, and overcrowded airplanes. In the latest generation of commercial transports, environmental pressures and increased cost of fuel have resulted in new designs. 4/

Domestic manufacturers of aircraft and spacecraft produce a wide variety of products. The U.S. market demand for aircraft and spacecraft is cyclical, fluctuating with interest rates, the cost of fuel, U.S. Government procurement policies, increased passenger traffic, and route expansions. The latter two were cited by U.S. airlines as the primary factors influencing market demand for aircraft. Other factors noted were efficiency and passenger comfort. 5/ Demand for both business and private use aircraft is influenced by such factors as intended use, convenience of scheduled airlines, cost of fuel, financing, cost of the aircraft, and degree of expertise of the buyer. The demand for military aircraft and spacecraft is based on complex political factors and budgetary limits. Commercial spacecraft demand depends on the intended use and such market forces as cost efficiency, and availability of the product, and the necessary launch vehicles.

1/ Aerospace Industries Association, Aerospace Facts and Figures, 1982/83, and General Aviation Manufacturers Association, GAMA Stat Databook, 1983.

2/ Robert Newhouse, "A Sporty Game, Betting the Company," The New Yorker, June 14, 1982, p. 58.

3/ Ibid.

4/ Barry Bluestone, Peter Jordan, and Mark Sullivan, Aircraft Industry Dynamics, Boston, 1981, p. 47.

5/ The Economic Impact of Foreign Export Credit Subsidies on Certain U.S. Industries, . . . , USITC Publication 1340, January 1983.

U.S. shipments

The aerospace industry is one of the Nation's most cyclically volatile in terms of sales and shipments. The sector exhibits its own unique business cycles for civil aircraft, military aircraft, and spacecraft. The following tabulation shows estimated U.S. shipments of aircraft, spacecraft, and parts during 1954-82 (in millions of dollars): 1/

Year	Civil aircraft	Military aircraft	Spacecraft	Parts	Total
1954-----	2/ 5,226	2/	183	75	5,484
1958-----	2/ 6,482	2/	163	249	6,894
1963-----	559	2,876	1,911	740	6,086
1967-----	2,861	4,476	2,199	439	9,975
1972-----	3,308	3,247	1,656	3,437	11,648
1977-----	4,451	4,364	1,870	5,762	16,447
1978-----	6,458	4,664	2,324	6,238	19,684
1979-----	10,644	5,470	2,539	8,052	26,705
1980-----	13,058	6,521	3,483	8,867	31,929
1981-----	13,228	8,630	3,856	10,254	35,963
1982-----	8,610	10,356	4,851	10,041	33,858

1/ Includes both civil and military aircraft shipments.

2/ Source: Aerospace Industries Association, Aerospace Facts and Figures, various issues, 1954-83.

During the 1950's, the U.S. aerospace industry entered the modern era. The industry's products underwent radical transformation when the jet engine replaced the piston engine in the commercial aircraft sector. Since that time U.S. shipments of civil aircraft have greatly expanded, rising to their highest level (\$13.23 billion) in 1981. U.S. shipments of civil aircraft declined significantly in 1982 due to high-interest rates, decreased airline earnings, and lack of confidence in the airline industry by financial backers. 2/

U.S. shipments of military aircraft have gradually increased during 1963-82, rising to \$10.36 billion in 1982. Over the period 1963-67, U.S. shipments increased 55.6 percent, resulting from the escalation of the Vietnam War. A large portion of these shipments were helicopters, which were used extensively for the first time during this period. 3/ Military deescalation caused shipments to decline in 1972. However, since that time, military aircraft shipments have increased annually as the United States assumed a more strategic role in international affairs.

1/ Ibid., footnote 1, p. 174.

2/ "Carriers Turn to Innovative Financing," Aviation Week and Space Technology, Nov. 8, 1982, pp. 46-49.

3/ Barry Bluestone, Peter Jordan, and Mark Sullivan, Aircraft Industry Dynamics, Boston, 1981, p. 42.

U.S. shipments of spacecraft began to increase following the successful Soviet Sputnik launch in 1957. During 1958-82, domestic shipments of spacecraft increased 27-fold, reaching \$4.85 billion in 1982. The U.S. space program began with unmanned expendable rockets and has evolved to reusable airplane-like spacecraft. In the most recent years, increased shipments were due, in part, to a rapidly growing military space program.

U.S. shipments of parts for use in civil, military, and space applications have increased significantly during 1954-82, commensurate with the use of aerospace products. Shipments of parts rose from \$5.5 billion in 1954 to \$33.9 billion in 1982.

U.S. imports

U.S. imports of aerospace products have risen annually during 1963-81, increasing from \$91.1 million to \$2.6 billion (table B-63, app. B). However, imports fell 4 percent, to \$2.5 billion, from 1981 to 1982. The majority of these imports consist of small airplanes, helicopters, and parts for aircraft and spacecraft. The level of import penetration in the U.S. aerospace market is relatively low, but has increased annually over the last two decades. The ratio of imports to consumption was 2 percent in 1963, but by 1982 had risen to 6.5 percent.

Imports of aerospace products from Canada and Brazil followed an upward trend during 1963-82. The value of these imports rose from \$55.8 million in 1963 to \$1.5 billion in 1981, but in 1982 declined to \$855.0 million because of the economic recession. Imports from Canada and Brazil accounted for 61.3 percent of total U.S. aerospace imports during 1963, compared with 34.5 percent in 1982. The majority of these imports were turboprop commuter aircraft. The ratio of Canadian and Brazilian imports to U.S. consumption of aircraft and aerospace products ranged from 1.1 percent of consumption in 1963, to 6.1 percent in 1981. The ratio fell to 3.5 percent in 1982.

Conditions of competition in the U.S. market

The domestic aerospace industry dominated the U.S. market in almost every sector during 1963-82. In addition to excellence in product quality and innovation in technology, the after-sale support provided by U.S. firms has built their reputations as leaders in the field. Post-sale support has become a key determinant in procurement of aircraft. Purchasers are particularly concerned with ease of service, product reliability, parts availability, and long-run minimization of operating costs.

In the past two decades, the Canadian and Brazilian aerospace industries have worked to raise their technological level and competitiveness. The factors that are important to a firm's ability to compete in the U.S. aerospace market include high product quality, reliability, availability of affordable financing, and competent after-sales support. In recent years, these manufacturers have proved their capabilities in all areas and become important competitors in certain segments of the U.S. aviation market.

According to industry sources, the Canadian and Brazilian aerospace industries have a solid business base in the United States. Overall, their estimated share of the U.S. market rose from 1.1 percent in 1963 to 6.1 percent in 1981, but declined to 3.5 percent in 1982. However, the industry basically competes in only two areas of the market: commuter and business aircraft. 1/ The number of airplanes built by Canadian and Brazilian firms for use by the commuter airline industry increased from 153 (9.4 percent of the total fleet) in 1979 to 302 (19.2 percent of the total fleet) in 1982. 2/ The estimated number of Canadian-built business airplanes in use in the United States totaled 81 in 1982, or approximately 2 percent of the total U.S. fleet. 3/ Data are not available regarding the number of Brazilian aircraft in use as business aircraft. U.S. industry sources attribute these increases to intensified marketing efforts by these manufacturers, coupled with favorable financing.

International markets

The United States is the world's leading supplier of aerospace products. Industry officials indicate that U.S. sales of these products represent approximately 60 percent of the free-world total. Other major producers of aircraft, spacecraft, and parts (in order of importance) are located in the United Kingdom, France, West Germany, and Canada. 4/

The market for aerospace products has spread throughout the world, with the heaviest concentration in North America, Europe, and Asia. In the world market for aircraft, the vast majority of commercial export sales are made to foreign governments rather than to private sector airlines, because most foreign airlines are state-owned national carriers. The largest part of the remaining export sales are made to foreign military establishments. 5/

The factors influencing demand in the international market for aircraft are identical to those in the U.S. market discussed earlier in this report. U.S., Canadian, and Brazilian producers market their products internationally in a similar fashion. Interest in the product is generated by appearances at trade shows, by magazine articles and advertisements, and by direct mail programs. Sales offices are in various locations throughout the world, with a large staff of salespeople that remain in constant contact with potential purchasers. However, in recent years, aircraft firms have been forced by governments to compete on the basis of coproduction (offset) percentages, as well as price and quality. Since virtually all international sales are made to governments rather than to private firms, overseas purchasers are often

1/ Aircraft engines are produced in Canada by Pratt & Whitney of Canada, however, this is a wholly owned subsidiary of the U.S. firm.

2/ Regional Airline Association, Annual Report-Regional/Commuter Airline Industry, 1979 and 1982.

3/ "The World of Business Aviation," Interavia, July 1983, p. 8.

4/ "Canada Aerospace '83," Aviation Week & Space Technology, Apr. 18, 1983.

5/ Bluestone, Jordon, and Sullivan, op. cit., p. 167.

willing to pay a premium price in return for a share of manufacturing that would help their trade balance and create employment for their own workers. ^{1/} The U.S. aerospace industry, because of its large size and diversity of product manufacture, has been able to meet foreign demand for offsets and coproduction. This has enhanced the United States manufacturers' international competitiveness and made the critical difference in many aircraft sales. Conversely, Canadian and Brazilian manufacturers, because of their limited product mix, have been less successful in this area.

U.S. exports

Export sales are very important to aerospace manufacturers, as the economies of scale involved can lower a firm's unit costs substantially and improve competitiveness and profitability. As a share of estimated U.S. shipments, exports represented 17.8 percent in 1963. By 1982, this share had risen to 34.4 percent. U.S. exports of aircraft, spacecraft, and parts rose from \$1.1 billion in 1963 to a peak of \$14.6 billion in 1981, before declining to \$11.6 billion in 1982 (table B-1). The decline in exports in 1982 was caused by a worldwide decrease in demand for aircraft and spacecraft brought about by the worldwide recession and high interest rates. Additionally, increased foreign competition in many traditional export markets contributed to the decline. Over the last two decades, the statistical reporting category "not disclosed" was the leading line item for U.S. exports of aerospace products. These exports were primarily aircraft and parts for military use throughout the world. Japan, West Germany, and Canada represented the other major markets for U.S. aerospace exports during 1963-82.

The U.S. aerospace industry contributes a larger positive trade balance than any other U.S. industry, except agriculture. ^{2/} The U.S. aerospace trade surplus increased from \$12.0 million in 1954 to \$9.2 billion in 1982.

Selected country exports

Canada.--Exports are an integral part of the Canadian aerospace industry. Indeed, from 1963 to 1982, Canadian exports of aircraft and aerospace products increased from \$83.7 million to \$1.2 billion (table B-2). The United States was the major market for these exports, accounting for an average of 70 percent of the total. The United Kingdom and France were also important Canadian export markets during the period. In 1981, the industry exported 47 percent of its total production. The majority of Canadian exports are business and commuter airplanes and aircraft engines and parts.

Brazil.--Brazilian exports of aircraft and aerospace products increased tremendously during 1963-1982, rising from \$3.4 million to \$118.1 million (table B-3). During this period, the United States was the major export market, accounting for an average of 50 percent of total aircraft exports. In 1981, other important Brazilian export markets included Columbia and France. According to industry sources, Brazil currently exports commuter aircraft, military trainers, aircraft engine pistons and parts, parts for jet engines, parts for landing gears, tires, and airport radio communication equipment.

^{1/} Ibid, pp. 175-176.

^{2/} Ibid., p. 78.

Conditions of competition in international markets

Both the Canadian and Brazilian aerospace industries have been much more successful in their penetration of the U.S. market than they have been in other world markets. A large portion of both industries are government owned, and under government direction; both have strengthened their competitive position by pooling technological knowledge and reducing duplication among national firms. Additionally, by their participation in production, licensing, and offset agreements, they have gained access to previously unavailable or restricted markets.

Currently, the main product areas in which Canadian and Brazilian manufacturers are effectively competing with U.S. manufacturers in the international market are in commuter aircraft and business jets. In 1963, the Canadian and Brazilian industries posed little threat to U.S. manufacturers because of their limited success in marketing their aerospace products. However, in recent years, Canadian and Brazilian manufacturers have earned a reputation for quality products, timely delivery, and dependable after-sale support, which is considered to be on a par with that of U.S. firms.

Apparel

Description and uses

The products covered in this section include wearing apparel and accessories of textile materials (primarily manmade fibers, cotton, and wool) and of leather. ^{1/} In 1982, apparel made from manmade fibers accounted for 60 percent of total U.S. production of apparel made from textile materials, cotton apparel accounted for 37 percent, and wool apparel for 3 percent. Leather wearing apparel accounted for less than 1 percent of total U.S. apparel shipments in 1982.

The major apparel categories included in the coverage are men's and boys' furnishings and suits and coats; women's and children's outerwear; sweaters; undergarments; nightwear; waterproof garments; headwear; hosiery, gloves, scarves and mufflers; and apparel belts. Of these, men's and boys' furnishings, which includes shirts, nightwear, underwear, neckwear, separate trousers, and work clothing; and women's outerwear, which includes blouses, dresses, suits, and coats, accounted for almost two-thirds of total U.S. shipments in 1981.

U.S. industry profile

Consumers purchase apparel from a variety of retail outlets, comprising specialty shops, department stores, national chainstores, discount stores, and factory retail outlets. Most of these outlets purchase apparel directly from importers and/or manufacturers. Some of the larger department stores maintain their own buying offices in New York, which import apparel directly. Large national chainstores usually contract with manufacturers, both here and abroad, to produce apparel according to the chains' specifications. Some specialty stores and small-to-medium-size department stores join independent buying groups which combine orders from several stores, buying in volume. In addition, specialty stores may buy from jobbers ^{2/} which supply these outlets with a variety of goods that would otherwise be unavailable to them. Discounters also purchase apparel from jobbers and, along with factory outlets, purchase excess merchandise directly from U.S. manufacturers.

The U.S. apparel industry is a highly competitive and fragmented industry, consisting primarily of many small firms and a few large multinational companies. (In 1981, 85 percent of apparel producing establishments employed less than 100 persons.) The competitive nature of the industry stems primarily from the rapid shifts in fashion and styles. Most of the large multinational firms manufacture several product lines, such as

^{1/} Specifically excluded is apparel made from fur, rubber, and plastics.

^{2/} A jobber is a wholesaler that operates on a small scale or sells only to retailers and institutions.

women's wear, men's wear, and even children's wear; the smaller companies typically specialize in one-product area. Some restructuring has taken place in the industry as the larger firms have increased their market share. Because of their broader product lines and ability to finance professional management expertise and the latest technological developments, larger firms have been able to capitalize on the few growth areas occurring in a generally static market. However, industry sources indicate that small firms will retain their role in the industry because of their ability to adapt quickly to fashion changes and to produce profitably at small volume levels.

Three types of establishments are found in the apparel industry: manufacturers, jobbers, and contractors. Manufacturers produce their own garments from materials which they have purchased. On the other hand, jobbers sell manufacturers' finished products (or, in some instances, buy raw materials, contract out the garment production, and then market the finished products). In contrast, contractors manufacture garments for jobbers and/or manufacturers which in turn provide the required materials. Contractors do not become involved in sales, but rather ship the finished garments back to the jobbers and/or manufacturers for distribution.

Apparel production currently takes place in approximately 23,000 establishments, a decrease from almost 25,000 in 1978. The U.S. apparel industry developed in the Northeast where currently about half of the apparel producing establishments are located, (principally in New York). Apparel manufacturing gravitates to areas where a large supply of less expensive labor is found. Consequently, after World War II, some apparel production began to move to the South, reducing labor costs and taking advantage of the generally beneficial business environment. Although the South currently has fewer establishments than the Northeast, these establishments employ, on the average, more than twice as many persons than those in the Northeast. This reflects the South's newer and larger plants and its greater production of men's apparel, which typically requires larger scale production than the more fashion-oriented women's apparel.

The apparel industry ranks sixth in manufacturing employment. The number of employees in the industry remained around 1.3 million during 1978-80 and then decreased 10 percent to just under 1.2 million people in 1982. (Employment for all manufacturing from 1978 to 1982 declined 6 percent.) The number of production workers in the apparel industry decreased 13 percent from the level in 1978 to approximately 1.0 million in 1982.

The hourly wage of apparel production workers averaged only \$5.20 ^{1/} in 1982 compared with \$8.50 ^{1/} for all manufacturing; nevertheless, the U.S. apparel industry hourly wage was considerably higher than the hourly rates of approximately \$1.50 or less found in some of the principal foreign suppliers (i.e., Hong Kong, Taiwan, and Korea). This disparity is significant since labor costs typically account for about one-third of the wholesale value of U.S.-produced apparel. Although productivity, measured in terms of the value added per production worker, increased 29 percent from 1978-81, this improvement has not sufficiently closed the price gap between U.S. and foreign producers.

^{1/} Revised wage data, Bureau of Labor Statistics.

To the extent that any loss of domestic and/or international market share results from targeting practices, the corresponding absence of each \$1 million in production not undertaken by U.S. apparel manufacturers would translate into an estimated 55 workers displaced in all sectors of the U.S. economy (based on 1982 production/employment relationships) according to the staff of the U.S. International Trade Commission, using the BLS input-output model, as seen in the following tabulation:

Industry sector	Employment
	<u>Number</u>
Apparel-----	31
Other manufacturing-----	15
All other-----	9
Total-----	55

Foreign industry profile

Brazil.--Brazil's apparel industry is highly domestic oriented and growing. There were about 3,000 firms, which together employed 349,700 workers in 1980. 1/ Most of these firms are small. Only 70 firms employed more than 500 employees each. Several large apparel manufacturers are vertically integrated and have their own fabric production facilities, as well as retail outlets throughout the country. 2/ Apparel producers are concentrated in Sao Paulo and other Southeastern States. Those firms in Sao Paulo supply the largest share of the domestic market and generate the most exports. Unlike the textile industry which has received substantial foreign investment, the apparel industry is almost entirely Brazilian owned. 3/ Although investment in the apparel industry increased during 1970-79, its share of total manufacturing investment declined from 2.1 to 0.3 percent. 4/

The production of apparel (including footwear) rose 28 percent between 1975 and 1982, after showing a modest decline in 1981. 5/ The industry uses mostly locally produced fabrics and yarn in the manufacture of its apparel and sells most of its output locally. Exports are small, representing only 0.2 percent of world apparel exports.

1/ World Bank, Brazil: Industrial Policies and Manufactured Exports, Report No. 3766 B.R., July 1982, p. 167.

2/ Donna Jablonski, International Textile Review, Washington, 1981, p. 4.

3/ Including footwear.

4/ World Bank, op. cit., p. 169.

5/ General Agreement on Tariffs and Trade, Textile and Clothing Statistics COM. TEX/W/143, December 1983, p. 9.

The apparel industry has grown rapidly in the last decade and has become a major employer in Brazil. Employment tripled in the last decade rising to nearly 350,000 persons in 1980. 1/ This represented 8.3 percent of total employment in the manufacturing sector in 1980 compared with 5.8 percent in 1970. 2/ The 1982 hourly wage rate for Brazilian apparel production workers was estimated to be at \$1.25, 3/ which represented only 19 percent of the U.S. rate. The Brazilian rate was close to Mexican and Taiwanese wages, but greater than the Korean apparel rate.

The retail distribution system in Brazil is different from that in the United States. Specialty stores predominate, whereas department and chain stores account for only 5 to 10 percent of apparel sales. Mass merchandising and mail order operations are usually non-existent. 4/

Korea.--The development of the apparel industry in Korea has been controlled and planned by the Korean Government since the 1960's to achieve import substitution and export growth. Having been protected by the Government since the 1960's through tariff and nontariff barriers, as well as receiving beneficiary Government incentives in the form of industrial marketing assistance, tax credits, and direct aid, 5/ the industry has expanded more rapidly than those in most other countries. During the last 15 years, Korea's apparel industry has increased its output twenty-seven-fold, albeit from a relatively small base. 6/ The industry has increased its manufacturing capacity by 46 percent and production by 50 percent during the last 5 years. 7/

Approximately 7,000 firms manufacture apparel and other textiles in Korea. They employ 24 percent of the total manufacturing work force, making the textile and apparel sector the most important source of employment in Korea. In 1982, the apparel industry alone employed 383,000 workers, or 12 percent of the industrial work force, up 7,000 workers since 1979. 8/ The apparel industry is the primary consumer of textiles manufactured by Korea's textile industry.

Korea's apparel industry ranks among the lowest cost producers in the world, principally because of its low-cost labor. However, the apparel industry has been beset by significant worker turnover, reflecting the fact that women, which make up slightly more than three-fourths of its work force, tend to work for a few years and then quit to get married.

1/ World Bank, op. cit., p. 167.

2/ Ibid.

3/ Estimated by the staff of the U.S. International Trade Commission based on spinning and weaving labor cost data published in Spinning and Weaving Labour Cost Comparisons, Autumn 1982, a report of Werner International Management Consultants, Inc., New York

4/ U.S. Department of Commerce, International Trade Administration, Latin American Market, Apparel, August 1980, p. 14.

5/ U.S. Department of Commerce, Country Market Survey Apparel, Korea, December 1979, p. 4.

6/ Bank of Korea, Economic Statistics Yearbook, 1983, p. 146.

7/ Ibid.

8/ U.S. Embassy, Seoul, Korea, Annual Korean Textile Industry Report, July 19, 1983.

A substantial portion of the apparel production in Korea is owned by registered trading companies, which control all importing and exporting. By Korean law, only registered traders are authorized to import goods in their own names. 1/ A typical distribution scheme consists of importation by trading companies for distribution through their manufacturing subsidiaries' via various product lines.

Mexico.---The Mexican apparel industry manufactures primarily for domestic consumption and is comprised of approximately 10,500 firms. There are approximately 390,000 employees employed in the industry and an additional 158,000 employees working for subcontractors. 2/ Most establishments are small; in fact, 80 percent of the establishments account for less than 4 percent of production. 3/ Approximately 70 percent of the firms are located in the Federal District and worked at 75 percent of installed capacity at the end of 1982. 4/ Domestic investment in the industry in recent years has been minimal in part because of the devaluation of the peso, inflation in Mexico, and the lack of liquidity and raw materials. Also productivity has been relatively low, possibly because of the protected domestic market environment. The larger firms dominate the export business, but a significant portion of the exports does come from smaller firms. However, the efforts of smaller firms are inhibited by the fact that they find it difficult to get adequate information about foreign markets and often do not have sufficient capacity to fill sizable orders. In addition, lack of liquidity and raw materials make it harder for them to make export commitments despite the export opportunities that exist in the border areas.

The Mexican apparel market is highly diversified. Retail outlets range from department stores and specialty shops selling expensive high fashion goods, to market stalls or street vendors, selling traditional apparel.

Taiwan.---The apparel industry, along with the textile industry, form Taiwan's most important industrial sector in terms of export earnings, industrial output, employment, and investment. 5/ The apparel industry's development has been carefully planned by the Government, which has protected the home market, offered special incentives, and controlled access to foreign exchange. More recently, the industry has been upgrading the quality of its apparel for export, prompted by increasingly tight restrictions on its shipments in its major foreign markets and growing competition from new and secondary suppliers with even lower labor costs.

The Taiwan apparel industry is characterized by small factories. In 1981, there were 823 registered garment producers, including 243 sweater manufacturers. Only 26 of the garment producers and 5 of the sweater manufacturers had assets in excess of \$1.4 million. 6/ In addition, there were a large number of unregistered firms.

1/ U.S. Department of Commerce, Country Market Survey, Apparel, Korea, December 1979, p. 18.

2/ U.S. Embassy, Mexico, Outlook for Mexican Textile and Apparel Industries, Sept. 20, 1983.

3/ Ibid.

4/ Executive De Mexico, S.A., The Mexican Economy Analysis, 1982.

5/ American Institute for Taiwan, Taipei, Industrial Outlook Report, Textiles, June 1983.

6/ Ibid.

Taiwan's apparel industry employs over 120,000 people. Although the industry's labor costs are relatively low, its wages have increased considerably in recent years as the rapid industrialization taking place there has intensified competition among industries for available workers. The industry has been reasonably successful in attracting new workers, but rising educational standards are undermining those efforts, as in the case of Korea.

The apparel industry obtains most of its raw materials from the local textile industry. However, it suffers from bottlenecks and quality control problems in the downstream dyeing and finishing industry which is not able to handle all the output from the manmade-fiber industry efficiently.

Taiwan produces both knit and woven apparel, although the knits are the more important category. Production of knit apparel, except sweaters, totaled 48.7 million dozen in 1982, 1/ an increase of 1.8 percent over that in 1981. Production of sweaters dropped 10.8 percent to 9.3 million dozen in 1982 from a year earlier. By contrast, production of woven apparel increased 16.5 percent to 34.7 million dozen. Despite the sluggish performance of sweaters and other knit apparel in 1982, all three product categories showed two - to threefold growths during the period 1973-82.

The domestic distribution and merchandising of apparel produced in Taiwan is outdated by U.S. standards. 2/ However, this does not adversely affect the competitiveness of Taiwan's apparel industry vis-a-vis foreign producers, because of Taiwan's import controls and low cost domestically produced products.

U.S. market

Overall demand for apparel in the United States has been relatively static. In recent years, consumption increased between 1 and 2 percent annually, closely following population growth. The major factors influencing demand for apparel have been changes in consumer lifestyles, fashion, and consumer buyer power, interest rates, and retailers' attitudes as affected by the general economic climate. In terms of value, U.S. apparent consumption increased almost 150 percent in the past 15 years to \$52.8 billion in 1982 3/ (table B-63). Much of this increase, especially in the value of U.S. shipments, was due to inflation. Real growth occurred in imports as foreign companies, especially those in the low-cost, Far Eastern countries grew and gained experience in the manufacture and marketing of apparel. The U.S. apparel market is supplied by imports mostly from the low-wage countries of the Far East, primarily Hong Kong, Korea, Taiwan, and China. These countries along with the Eastern European and South American countries, supply the U.S. market with low-to-medium-priced apparel. The EC countries supply the market mainly with medium-to-high-priced merchandise.

1/ American Institute for Taiwan, Taipei, Industrial Outlook Report, Textiles, June 1983.

2/ U.S. Department of Commerce, Country Market Survey, Apparel, Taiwan, March 1980, p. 7.

3/ During 1983 consumer expenditures on apparel increased significantly and apparel consumption rose as general economic conditions improved.

Expenditures for clothing and accessories, ^{1/} as a percent of total personal expenditures, declined from 5.8 percent in 1978 to 5.1 percent in 1982. In response to sluggish consumer spending, producers and retailers kept inventories at low levels.

U.S. shipments

The value of U.S. producers' apparel shipments increased by 124 percent from \$20.6 billion in 1967 to \$46.1 billion in 1982. Most of this increase reflected inflation, rather than real growth in production. In terms of 1972 dollars, U.S. producers' shipments increased by only 3 percent overall from 1972 to 1982, as shown in the following tabulation based on revised data of the Bureau of Industrial Economics, U.S. Department of Commerce (in millions of 1972 dollars):

<u>Year</u>	<u>Apparel shipments</u>
1972-----	27,810
1977-----	30,560
1979-----	29,763
1981-----	29,497
1982-----	28,720

According to the Federal Reserve Board's index of industrial production, U.S. apparel production increased 51 percent from 1963 to 1977; stabilized from 1977 to 1979; and then declined in 1980 and 1981, as shown in the following tabulation:

<u>Year</u>	<u>Production index</u>
1963-----	89.1
1967-----	100.0
1972-----	109.4
1977-----	134.2
1978-----	134.2
1979-----	134.4
1980-----	127.0
1981-----	120.4

The decrease in production during 1980-82 reflected the general economic slow-down of the period and increased competition from imports.

U.S. imports

U.S. imports of apparel totaled approximately \$7.5 billion in 1982, over four times higher than the value of imports in 1972 (table B-63). ^{2/} In terms

^{1/} Excludes footwear.

^{2/} In 1983 these imports rose by an additional 17 percent.

of quantity, apparel imports fluctuated during 1969-81, declining to lower levels in 1973 and 1974, and again in 1979 and 1980, reflecting the economic slowdowns of those years. Overall, the quantity of imports grew 106 percent from 1.5 billion equivalent square yards in 1969 to 3.4 billion equivalent square yards in 1982, as shown in the following tabulation:

<u>Year</u>	<u>Imports</u> <u>(in million equivalent</u> <u>square yards)</u>
1969-----	1,520.1
1970-----	1,686.1
1971-----	2,097.6
1972-----	2,225.9
1973-----	2,089.8
1974-----	1,937.0
1975-----	2,076.8
1976-----	2,428.4
1977-----	2,466.3
1978-----	2,905.4
1979-----	2,671.2
1980-----	2,884.1
1981-----	3,135.9
1982-----	3,382.1

the increase in the value of imports largely reflected rising prices and an increase in imports of higher value-added items. The major foreign sources of apparel were Hong Kong, Taiwan, and Korea, which together accounted for almost 60 percent of the total value of U.S. apparel imports during 1978-82. The fourth largest source was China, whose shipments increased almost 10 times the 1978 level to 588 million in 1982.

In general, imports as a share of the U.S. apparel market, in terms of value, grew from 2.8 percent in 1967 to 14.2 percent in 1982. However, when duty, freight, insurance, commissions, and importers' markup are added to the custom's entry value, imports' market share would have been closer to 25 percent in 1982. Also, import penetration is much higher in specific product areas, such as gloves, sweaters, shirts and blouses, outerwear coats, and trousers. Imports' market share for trousers was 34 percent in 1982; for sweaters, just over 56 percent.

U.S. imports of textiles and apparel have been subject to control under the Multifiber Arrangement (MFA) since 1974. ^{1/} Currently, the United States

^{1/} Officially known as the Arrangement Regarding International Trade in Textiles and sanctioned under the General Agreement on Tariffs and Trade, the MFA provides the legal framework for the regulation of international trade in textiles and apparel through bilateral agreements. For a definitive discussion of the MFA, see The Multifiber Arrangement, 1973 to 1980: Report on Investigation No. 322-180 . . ., vol. 1, USITC Publication 1131, March 1981.

has agreements with 27 countries, 24 of which are MFA signatories. 1/ These agreements provide for specific limits or quotas on imports of specified products. They also provide for establishing quotas on unrestricted products when predetermined import levels are reached or when the United States determines that imports of a particular product are causing or threatening market disruption. 2/ In addition, the Administration announced new guidelines for administering the trade agreements program, which has resulted in increased negotiations leading to many additional apparel quotas.

U.S. Department of Commerce official statistics for U.S. imports for consumption, from Taiwan, Korea, Mexico, and Brazil are shown in the following tabulation (in millions of dollars):

<u>Year</u>	<u>Taiwan</u>	<u>Korea</u>	<u>Mexico</u>	<u>Brazil</u>
1978-----	854.7	692.4	173.5	20.8
1979-----	896.7	703.6	188.4	14.8
1980-----	1,130.0	836.5	218.2	12.7
1981-----	1,235.8	1,090.9	216.8	13.5
1982-----	1,434.0	1,135.3	152.8	13.1

Taiwan and Korea are two of the three largest foreign suppliers of apparel to the United States, together accounting for 37 percent of the value of total apparel imports in 1982. Currently, most apparel items from Taiwan and Korea are subject to specific quotas. The increasingly tight restrictions, however, have encouraged them to produce products not subject to MFA restraints (i.e., apparel chiefly of silk or linen) and to export higher priced merchandise to maximize their export revenues. During 1978-82, apparel imports from Taiwan and Korea increased by 66 percent to \$1.4 billion and \$1.1 billion, respectively. Taiwan and Korea were major suppliers of leather wearing apparel; Korea alone accounted for 58 percent of the value of 1982 imports. In addition, the tight restrictions on apparel from these major suppliers have stimulated import trade from new and secondary source countries around the world.

1/ As of August 1984, the United States had bilateral agreements with the following MFA signatories: Brazil, China, Colombia, Dominican Republic, Egypt, Haiti, Hong Kong, Hungary, India, Indonesia, Japan, the Republic of Korea, Macau, Malaysia, Mexico, Pakistan, the Philippines, Poland, Romania, Singapore, Sri Lanka, Thailand, Uruguay, and Yugoslavia. The United States also had similar agreements with the following non-MFA signatories: Costa Rica, Mauritius, and Taiwan.

2/ Agreements in effect during 1979-81 provided for annual quota growth by quantity of 6 percent, although imports of certain high-volume apparel items from major suppliers were held to lower growth rates. The agreements currently in effect with Hong Kong, Taiwan and Korea, (due to expire in 1987) permit an average annual growth on quota items of 1 percent. The agreement with China (also due to expire in 1987) provides for an almost 4-percent annual growth.

Although Mexico is a much smaller supplier of apparel to the United States than Korea or Taiwan, it is the largest source of garments imported under U.S. tariff provision 807.00. 1/ Under this provision cut garment parts from the United States are exported to Mexican contractors for sewing and finishing operations, then imported back into the United States. In 1982, these garments accounted for over 90 percent of total apparel imports from Mexico. During 1982, imports from Mexico dropped significantly, both in value and quantity, partly due to importers' concern about Mexico economic stability. In addition, U.S. manufacturers faced with the U.S. economic downturn reduced the number of their orders with Mexican contractors, in lieu of laying off domestic workers. 2/ Nine clothing categories were subject to quotas in 1982, consisting of the major import items; shirts, trousers, coats, and brassieres.

In the case of products from Brazil, apparel imports declined during 1978-1982. 3/ Imports from Brazil consisted primarily of cotton dressing gowns, trousers and knit shirts, (which are the only garments from Brazil that are currently subject to quotas).

Conditions of competition in the U.S. market

In terms of value, imports of apparel from the four subject countries accounted for approximately 5.2 percent of the 1982 U.S. consumption of these products, up from 0.2 percent of the total in 1967. Imports from these countries compete effectively on the basis of price, which is significantly lower than that of domestically produced apparel of comparable quality. Lower wage rates in these countries provide most of the cost advantage. In 1982, apparel production workers in Taiwan, Korea, and Mexico received wages of \$1.43 4/ per hour, \$0.79 5/ per hour and an estimated \$1.37 6/ per hour, respectively, compared with wages of \$5.20 per hour in the United States.

1/ This provision states that duty on articles assembled abroad wholly or partly with U.S.-fabricated components be applied to the full value of the imported article less the value of the U.S.-made components.

2/ During the latter part of 1983 and the first two quarters of 1984 imports from Mexico returned to their previous levels.

3/ Imports from Brazil increased significantly in 1983, due primarily to the U.S. market recovery.

4/ Bureau of Labor Statistics (BLS), U.S. Department of Labor.

5/ Estimated by the staff of the U.S. International Trade Commission based on wage data from Werner Management Consultants, Inc. NY. and 1982 average exchange rates calculated by the BLS.

Transportation is an important cost factor in apparel although its importance has declined in recent years. In 1981, average international transportation costs to ship to the United States accounted for 6.5 percent of the value of the apparel, down from 8.8 percent in 1976. Once landed in the U.S., imports and domestic merchandise are carried primarily by truck because of the relatively small size of individual shipments, the hanging or special handling required for many garments, and the large number of retail destinations. Trucking costs for imported items are reportedly somewhat higher than those for domestic merchandise because of considerable congestion at the ports and loading costs incurred there.

International markets

Some measure of world apparel consumption can be determined from analysis of textile fiber consumption, as well as an analysis of apparel imports by the major world markets. World apparel imports (including intra-EC trade) amounted to 41 billion dollars, in 1982. 1/ The developed countries absorbed three-fourths of the total in 1982, compared with 66 percent in 1963. The EC and the United States accounted for two-thirds of the total imports in 1982. The EC was the largest single market in 1982. 2/ The following tabulation shows the significant international apparel markets for years 1973 and 1982 (in billions of dollars):

<u>Market</u>	<u>1973</u>	<u>1982</u>
European Community----- <u>1/</u>	2.15	<u>2/</u> 8.83
United States-----	2.17	8.79
Japan-----	.57	1.83
Switzerland-----	.43	1.22
Sweden-----	.37	1.00
Canada-----	.33	.83
Austria-----	.18	.70

1/ General Agreement on Tariffs and Trade, Textile and Clothing Statistics, COMTEX/W/143, December 1983. This excludes intra-EC trade.

2/ Also excludes intra-EC trade as estimated by the staff of the U.S. International Trade Commission.

1/ General Agreement on Tariffs and Trade, Textiles and Clothing in the World Economy, May 4, 1984, p. 41.

2/ Based on United Nations data. However, it should be noted that about half of the EC's imports represent intra-EC trade and the remaining half are imported from outside the EC.

The developing countries are not major apparel import markets. Their markets are protected with prohibitive tariff and nontariff barriers. Brazil, Taiwan, Korea and Mexico each impose apparel import restraints which include high tariff rates that range from 50 percent ad valorem for Korea to 131 percent ad valorem for Taiwan. However, the developing countries are the major international source of apparel exports, accounting for 48 percent ^{1/} of world apparel exports in 1982, up from 15 percent in 1963. ^{2/} In contrast, developed countries accounted for 38 percent of apparel exports in 1982. Major individual sources of apparel in 1982 were Hong Kong, accounting for 12 percent of the total; Korea, 9 percent; Taiwan, 7 percent; and China, 6 percent. Principally because of their low labor costs, the goods of these suppliers have been highly price competitive in markets worldwide. The United States, the EC, and other West European countries generally supply medium to high priced, high-fashion products of quality and elegance. The United States exports primarily apparel that is identified with U.S. lifestyles and which sells in the middle price ranges.

Brazil and Mexico are neither major apparel markets nor major apparel exporters. They do not provide the style or fashion needed to market their products in major international markets, nor do they possess price advantages enjoyed by the major Asian suppliers.

U.S. exports

U.S. exports of apparel, though significantly higher during the 1980's than the 1960's remained relatively small, accounting for 1 to 2 percent of the total value of U.S. producer's apparel shipments during the past two decades. Apparel exports increased steadily from \$126 million in 1967 to \$1.1 billion in 1981, before declining by 25 percent to \$846 million in 1982 (table B-63). Major markets for finished apparel from the United States were Canada, Japan and the United Kingdom. In recent years, exports of garment parts shipped to low-wage countries in the Caribbean and South America for assembly and returned to the United States under TSUS item 807.00 have increased, rising from \$485 million in 1979 to \$638 million in 1983 in terms of the value of the returning completed apparel. The major U.S. export markets for garment parts were Mexico and the Dominican Republic, which received 15 percent and 7 percent of the total 1982 U.S. apparel exports, respectively (table B-9). ^{3/}

Selected country exports

Brazil.--Brazil's exports of apparel averaged \$100 million annually between 1977 and 1981, before declining to \$85 million in 1982. In 1982, almost 60 percent of Brazilian apparel exports went to the EC and the United States. The EC received 39 percent of the total. Although Brazil's exports to the EC have increased significantly since 1973, they represented only a very small share of EC's total apparel imports. Brazil's exports to the U.S. market have dropped, both in absolute and relative terms, since 1977.

^{1/} This share would be substantially higher if intra EC trade is excluded.

^{2/} General Agreement on Tariffs and Trade, Textiles and Clothing in the World Economy, May 4, 1984, p. 41.

^{3/} In 1983, exports to these two countries rose by 11 percent reflecting the improved U.S. consumer demand for the returning completed apparel.

Brazil's apparel exports to the United States have consisted primarily of cotton apparel (especially trousers, knit shirts, and robes). Other developed country markets for Brazil's apparel are Canada, Japan, Sweden, and Switzerland, but exports to these markets are not significant. Brazilian exports to these countries have also shown gradual declines since 1973. Among South American countries, Paraguay, Chile, and Venezuela are major Brazilian markets, and each has shown significant growth in the past decade.

Korea.--Korea's apparel exports increased eightfold in the past decade, rising from \$440 million in 1972 to \$3.7 billion in 1981, before declining to \$3.5 billion in 1982. Korea's largest markets were the United States and the EC, which accounted for 44 percent and 28 percent of Korea's apparel exports, respectively, in 1982. Shipments to the United States increased by 129 percent during 1976-82, to \$1.5 billion. Shipments to the EC rose by 137 percent, to nearly \$1 billion. These two markets, along with Japan, and Canada, accounted for 95 percent of Korea's apparel exports in 1982.

Mexico.--Mexico's exports of apparel increased until 1981 and then dropped significantly in 1982. The 1982 drop was attributed to Mexico's economic crisis and was exacerbated by the recession in the United States, the principal export market for Mexican apparel. In 1982, Mexico's apparel exports to the United States, including those that entered the United States under U.S. tariff provision 807.00, totaled \$176 million, representing approximately 97 percent of its total apparel exports. Although Mexico's exports to the United States increased from 1976 to 1982, Mexico's share of the U.S. apparel market dropped from 4.4 to 1.9 percent during this period.

Taiwan.--Taiwan was the second largest exporter of apparel to the United States in 1982 (Hong Kong was the top apparel exporter), with shipments totaling \$1.7 billion, representing nearly two-thirds of its world apparel exports. Other significant export markets for Taiwan's apparel were the EC, Japan, and Canada. Between 1976 and 1982, Taiwan's export growth rate to the United States increased significantly (169 percent) and doubled in the case of Japan and the EC. In the past decade, Taiwan has diversified and penetrated the Middle East market, particularly in Saudi Arabia and Kuwait. Its exports have increased rapidly in this region.

Conditions of competition in international markets

The pattern of competition in the international apparel market is chiefly determined by changes in price, fashion, relative labor costs, corporate strategies, and government policies. Although the low labor-cost advantage of the developing countries has been partially offset by the developed countries' automation and increased productivity, the rapid diffusion of new technology worldwide has diminished the technological advantages. In addition, the technological innovations and advances in transportation and communications have helped aid commercial activity across geographical distances and reduce costs of doing business internationally.

Korea and Taiwan have labor cost advantages and their governments' trade policies provide for special credit facilities, well-established distribution systems, and long-established market links in almost all major international markets. By contrast, Brazil and Mexico lack well-established distribution systems and market links which make it even harder for them to compete in international markets.

U.S. producers, in an effort to remain competitive in their own marketplace, manufacture apparel with low labor content. The U.S. products compete effectively with those items imported from Asian countries that are based on fashion appeal or other non-price advantages. U.S. producers also import from the Asian countries and ship garment parts to Mexico and other Latin American countries for assembly in order to remain competitive.

Automatic Data Processing Equipment Peripherals, and Parts

Description and uses

Automatic data processing equipment, peripherals, and parts (ADP equipment) are items used in the processing of information and in the manufacture of devices which process information. Automatic data processing machines (computers) are automatic electronic machines capable of accepting input data and performing operations on these data according to a set of instructions known as a program. They use peripherals such as paper and magnetic tape units, printers, magnetic disc and drum storage devices, and remote terminals, to input data, to store data, and to output data. Parts of computers include basic mechanical and electrical components and also subassemblies of these components. In many cases, the subassemblies require relatively little additional assembly.

Computers and automatic data processing machines are used by virtually every major U.S. firm. They are also used extensively by the Department of Defense and other Federal, State and local government agencies, as well as by public utilities and educational institutions.

In recent years, demand for remote terminals, minicomputers, microcomputers, computer-controlled testing and manufacturing equipment, and data modems has increased. With the rapid development of integrated circuits, which can consist of a complete computer (less power supply and input and output devices) on a piece of silicon less than one-quarter inch square, computers and automatic data processing machines are undergoing a revolutionary change in size and versatility.

U.S. industry profile

The U.S. automatic data processing machine, peripheral, and parts industry is composed of approximately 1,000 firms which employed an estimated 340,000 workers in 1982 (table B-63, app. B). The five largest firms are estimated to account for over 75 percent of the total value of shipments. Because of the complexity of the machines and the diversity of the uses to which they are put, workers in the computer industry tend to be among the most highly skilled in all manufacturing. These skills range from those of assembly line workers to design engineers. Employment has grown at approximately 10 percent per year during 1978-81; however, the rate of growth was considerably lower in 1982 because of the business downturn.

To the extent that any loss of domestic and/or international market share results from targeting practices, the corresponding absence of each \$1 million in production not undertaken by U.S. automatic data processing manufacturers would translate into an estimated 45 workers displaced in all sectors of the U.S. economy (based on 1982 production/employment relationships), according to the staff of the U.S. International Trade Commission, using the BLS input-output model, as seen in the following tabulation:

Industry sector	Displacement of employment
	(Number)
Automatic data processing-----	18
Other manufacturing-----	14
All other-----	13
Total-----	45

Foreign industry profile

Production and capacity in the four countries surveyed here, Brazil, Mexico, the Republic of Korea, and Taiwan, is limited in both scale and sophistication. Generally, the industry in each country is small relative to the size of its domestic market. In all cases, well over one-half of the domestic market is supplied by imports, and in one case, over 90 percent is supplied by imports. The kinds of equipment which are produced tend to be small or home-type computers, peripherals, and parts. Government involvement in promotion of the industry is also a common characteristic with emphasis on the development of domestically capitalized firms. Foreign subsidiary investments are frequently required to be in the form of joint ventures, in which local majority ownership is mandatory. Wholly owned subsidiaries are permitted if they supply technologically advanced equipment that cannot be locally produced. Also, in most of these countries, skilled labor is in short supply, which contributes to the limited size and scope of the industry. The major end users of ADP equipment in these countries are the government and the manufacturing and financial sectors in the private economy. End users typically acquire their equipment from one source both for the main computer and associated peripherals; however, multiple sourcing is increasing.

U.S. market

The U.S. market for computers, peripherals, and parts includes every type of business establishment and household in the United States. Until about 1977, the major markets for computers and data processing machines were large industrial concerns, the military, and educational institutions. However, with the introduction of personal computers, the market has expanded to include small businesses and, to a limited extent, individuals in all types of businesses that utilize such computers as a desk-top aid; this is expected to be the case in the foreseeable future as well.

The domestic computer market is dynamic in that it is expanding rapidly. Many new firms have joined the industry, and there have been a number of exits as firms have gone bankrupt or decided that there is too much competition to allow for acceptable profit levels. Most of the exits have been in the personal and home computer segments of the market.

U.S. shipments

U.S. producers' shipments of automatic data processing machines, peripherals, and parts increased from \$17.6 billion in 1978 to \$33.9 billion in 1982, increasing by 93 percent overall, or 18 percent per year (table B-63). Apparent U.S. consumption increased from \$14.2 billion to \$27.3 billion during the period, representing an increase of 92 percent overall, or 18 percent per year; essentially the same percentage increase as that for shipments.

Large-scale computer systems are generally marketed through company-owned outlets or by direct sales forces. Such systems may be sold or leased to the user. Pricing of such systems is usually done on the basis of negotiations which stipulate terms such as warranties, performance guarantees, and maintenance. Smaller computers, such as personal computers, and peripherals are marketed through both company-owned outlets and independent distributors. Pricing of small computer systems varies with the number and kind of peripherals included in the system. Price lists for the computer and associated peripherals are maintained by the outlets and generally include provisions for quantity discounts. Parts are purchased by data processing original equipment manufacturers and, in many cases, are supplied on an intracompany basis.

U.S. imports

U.S. imports of automatic data processing machines, peripherals, and parts increased from \$755 million in 1978 to \$2.3 billion in 1982, increasing by 204 percent overall, or 32 percent per year (table B-63). Imports of these three product groups have grown at different rates. During 1978-82, imports of automatic data processing machines grew at a rate of 16 percent per year; imports of peripherals at 33 percent per year; and imports of parts at 38 percent per year. In 1982, ADP machine imports were \$336 million, peripheral imports were \$639 million, and imports of parts were \$1.3 billion. Japan was the principal source of imports in 1982.

Imports of ADP equipment from Brazil, South Korea, Mexico, and Taiwan have increased in recent years but still remain small, never exceeding \$75 million. As a percent of total U.S. imports, aggregate imports from these countries were roughly 8 percent in 1978, and 6 percent in 1979, but compared with the size of the U.S. market, these imports were negligible. Taiwan and Korea were the principal sources accounting for an average of 92 percent of the imports from the four countries in 1978 and 1979, according to United Nations data.

Conditions of competition in the U.S. market

The U.S. market is principally served by U.S. manufacturers. U.S. manufacturers compete generally on the basis of the overall capabilities of the system in large-scale computer system placements. For such systems some manufacturers may offer better delivery times but less maintenance; other may offer longer delivery times but better system software support. Price also

determines which manufacturer will win a contract to supply a computer system. Competition in personal computers is much more intense, with many new firms introducing their own particular model. Because of size limitations (i.e., personal computers tend to be desk-top models) many of these computers have similar characteristics, and price is a more important determinant in the purchase decision than it is for large-scale computer systems, especially if quantity discounts are available. Competition in the peripheral market is generally on the basis of price and features. For example, computer printers operate at various speeds with the higher speeds commanding higher prices for a given print quality. Similarly, remote computer display terminals vary in price according to the resolution of the display tube and the reliability of the keyboard. Parts, however, are of a more homogeneous nature.

International markets

Principal world markets for automatic data processing machines, peripherals, and parts are the United States, the EC, and Japan. Other major industrial countries such as Canada, Switzerland, and Sweden are also large markets for these products. Worldwide demand for these products is a function of the need to process vast amounts of information generated by business, government, and scientific activity. Thus, demand is especially strong in the industrial countries.

The U.S.-based industry currently enjoys a technological lead, principally in automatic data processing machines. U.S. producers of personal computers appear to have technological advantages also; however, inexpensive home computers, which may or may not be marketed with video games, tend to be produced in low-wage-rate countries because the technology level of such items is relatively low and easily transferred to offshore locations.

The EC-based industry has a number of large firms capable of producing automatic data processing machines which are competitive with U.S.-produced machines; however, the U.S. industry still enjoys a competitive advantage. Also, U.S. subsidiaries are among these large automatic data processing machine producers in Europe, and this has fostered the transfer of technology from the United States to the EC with trade in these products following this transfer.

U.S. exports

U.S. exports of automatic data processing machines, peripherals, and parts increased from \$4.1 billion in 1978 to \$9.0 billion in 1982, or by an increase of 116 percent or 21 percent per year. Based on United Nations export data, 46 percent of U.S. exports of these products went to the EC in 1981 (table B-11). The next largest markets were Canada, which accounted for 12 percent of U.S. exports, and Japan, which accounted for 8 percent. Comparable figures for U.S. exports in 1972 show that 37 percent went to the EC; 23 percent to Canada; and 10 percent to Japan. This indicates that from 1972 to 1981 the EC became a relatively more important market for U.S. exports. In fact, in 1981, the United Kingdom was the largest single country market for U.S. exports, surpassing Canada which had been the largest market in 1972 and 1977.

U.S. exports to Brazil, Korea, Mexico, and Taiwan, as a group, increased from \$29 million in 1972 to \$44 million in 1977; subsequent aggregate data is not available. Mexico was the leading market in 1977 accounting for 32 percent, (\$14 million) of U.S. exports.

Selected country exports

Total exports from Brazil, South Korea, Mexico, and Taiwan increased from \$23 million in 1972 to \$140 million in 1977. These exports are believed to be principally parts and low technology peripherals. Brazil accounted for over 50 percent of aggregate exports, in 1977; Taiwan, 33 percent. The United States and Japan were the principal export markets for these countries.

Conditions of competition in international markets

U.S. products appear to compete well in world computer markets. Such products enjoy good worldwide reputations in main frame systems for hardware, software, and support. U.S. minicomputer and microcomputer systems are also quite competitive, although they do face competition from a variety of EC-based sources and Japan. A similar situation exists with regard to peripherals. One reason for the competitive position enjoyed by U.S. firms is the large number of foreign subsidiaries located in major EC countries and the wide range of products manufactured by U.S.-based firms. EC-based firms compete well with U.S. firms in certain product lines, but do not produce as wide a range of products as U.S. firms.

In the case of Brazil, Korea, Mexico, and Taiwan, Brazilian companies have become reputable producers of microcomputers and certain peripherals, though production is, at present, used to satisfy demand in the local market. Attempts to expand production into minicomputers have not been successful, due principally to the lack of technology required to make the jump to this higher performance machine. Mexico remains a virtual assembly operation area for foreign manufacturers. Some of the Mexican products are exported to Central American countries and parts to the United States, but, in general, no significant trade in computers flows out of Mexico. South Korea has limited production of mini, micro, and personal computers owing to a lack of technology. In 1983, computer production was estimated to be \$200 million, of which one half was exported; however, the value added in South Korea was only 20 to 50 percent of the value of production. Taiwan also produces only a limited amount of computers for similar reasons. Peripherals represent the bulk of ADP equipment manufacture in Taiwan.

Automobiles

Description and uses

The products covered in this section include new and used automobiles designed principally to transport passengers. Automobiles can be used commercially (taxi) and privately (personal) and are usually identified by make (brand name of manufacturer) and by model (the corresponding styles vary). Most makes and models sold in the United States have four wheels, two axles, and a power train consisting of an internal combustion engine, which is fueled by either gasoline or diesel fuel, a transmission by which the speed of the vehicle is manually or automatically controlled and a differential, or transaxle, by which the force of the engine is transmitted to either the front axle (front-wheel drive), rear axle (rear-wheel drive), or both axles (four-wheel drive). In the rear wheel drive, the engine and transmission are usually mounted at the front of the vehicle, and the differential is mounted at the rear, or the engine is mounted at the front and the transmission and differential are mounted at the rear, or all three components are mounted at the rear. In some vehicles, the engine and transmission are mounted behind the front seat, and the power is transmitted to the rear wheels. In the front-wheel-drive vehicle, all three components are mounted at the front of the vehicle. Automobile engines are distinguished primarily by the number of cylinders (usually four, six, or eight) and their corresponding displacement, and by the type of fuel they require (usually gasoline or diesel). Historically, most imported automobiles were equipped with 4-cylinder engines, and most automobiles produced in the United States had 6- or 8-cylinder engines. Since the mid 1970's, the proportion of U.S. -built automobiles with 4-cylinder engines has increased dramatically, due to an increase in demand for more fuel-efficient automobiles. The demand for fuel efficiency has also affected the size of the car. The oil embargo of 1973 and 1974 eroded the popularity of intermediate and standard size automobiles and increased purchases of compacts and subcompacts.

U.S. industry profile

Automobiles are normally distributed through retail dealer outlets located throughout the United States. In the case of Government or some large-fleet purchasers, vehicles typically are shipped directly to the buyer, but the percentage is relatively small in relation to total domestic sales. At the producer level, vehicles are seldom held in inventory, they are normally shipped to the retail dealer within a few days after production.

There are currently three U.S.-owned automobile manufacturers, one primarily U.S.-owned manufacturer, and two foreign-owned subsidiaries operating in the United States. The top three automobile producers (all U.S.-owned) accounted for about 95.0 percent of total U.S. production in 1983.

The level of skill of production workers in the motor-vehicle industry ranges from low, or unskilled assembly operators, to highly skilled machinists. In addition, some tasks that were traditionally performed by assembly employees are now accomplished using robots. These robots are used primarily for welding and painting operations, but it is likely that the use of industrial robots will continue to expand into other areas as they become more sophisticated and the initial cost declines.

Employment of all workers and of production workers in the motor-vehicle industry (SIC No. 3711) was as follows (in thousands of workers): 1/

<u>Year</u>	<u>All workers</u>	<u>Production workers</u>
1960-----	361.2	273.0
1963-----	360.5	269.4
1967-----	401.0	296.8
1972-----	415.2	304.9
1977-----	443.0	329.6
1978-----	469.7	349.1
1979-----	463.0	340.8
1980-----	368.1	252.8
1981-----	358.7	251.9
1982-----	317.5	220.7
1983-----	351.1	254.4

The number of workers employed in this industry reached its highest level of 469,700 workers in 1978, steadily declined in each of the following years to 317,500 workers in 1982, and then increased to 351,100 workers by the end of 1983.

To the extent that any loss of domestic and/or international market share results from targeting practices, the corresponding absence of each \$1 million in production not undertaken by U.S. automobile and truck manufacturers would translate into an estimated 23 workers displaced in all sectors of the U.S. economy (based on 1982 production/employment relationships), according to the staff of the U.S. International Trade Commission, using the BLS input-output model, as shown in the following tabulation:

<u>Industry sector</u>	<u>Displaced employment</u>
	<u>Number</u>
Automobile and trucks-----	8
Other manufacturing-----	8
All other-----	7
Total-----	23

1/ Based on U.S. Department of Labor data.

Foreign industry profiles

Canada, Mexico, Brazil, and the Republic of Korea have emerged as rapidly growing motor-vehicle producers. The following table compiled from data published by the Motor Vehicle Manufacturers Association shows production of automobiles in Canada, Mexico, Brazil, and the Republic of Korea.

Table 93.--Number of new automobiles produced by manufacturers in selected countries, by specified years, 1963-83

Year	:	Canada	:	Mexico	:	Brazil	:	Korea
1963-----	:	532,243	:	49,458	:	86,024	:	1,063
1967-----	:	708,281	:	87,113	:	132,027	:	4,983
1972-----	:	1,135,702	:	163,005	:	408,712	:	9,525
1977-----	:	1,120,157	:	187,637	:	463,897	:	42,284
1981-----	:	796,378	:	355,497	:	406,004	:	68,760
1983-----	:	968,867	:	207,137	:	772,376	:	121,987

Source: Compiled from data published by the Motor-Vehicle Manufacturers Association.

Production of automobiles increased irregularly in Canada from 532,243 units in 1963 to 968,867 units in 1983. Canadian subsidiaries of U.S. automobile firms account for virtually all of the automobiles produced in Canada. After reaching a peak in 1973, production dropped in large part because of the 1973-74 OPEC oil embargo and the resulting increase in petroleum prices. By 1983, production had not yet returned to early 1970 levels, because of another petroleum shortage in 1980 and the general world-wide recession of 1981-83.

Production in Mexico increased from 49,458 units in 1963 to 355,497 units in 1981 and then declined to 207,137 units in 1983. Subsidiaries of all major U.S. producers, as well as some Japanese and European, have established production facilities in Mexico. A major West German producer is the largest manufacturer of automobiles in Mexico. The Mexican automotive market until recently had been growing rapidly, and Mexican producers did not have the capacity to meet the increased demand. As a result, Mexican exports remained very low when compared with those of other developing countries. The sharp decline in automobile production in 1983 is attributable primarily to the Mexican debt crisis and the worldwide recession. The worldwide recession has decreased the demand for petroleum. Mexico generated a large part of its revenues from the sale of petroleum. With the decline in demand of petroleum, the demand for automobiles also decreased.

Brazilian automobile production increased by 798 percent during 1963-83. During 1963, Brazil produced 86,024 units; in 1983, 772,376 units. Brazil has emerged as a rapidly growing automobile-producing nation. Subsidiaries of a West German firm and two U.S. firms account for the majority of automobiles produced in Brazil.

Korean automobile production increased from 1,063 units in 1963 to 121,987 units in 1983, or by 144 percent. Passenger cars in Korea are primarily manufactured by two domestic firms that are partly-owned by Japanese and U.S. interests.

The end users of motor vehicles, the level of skill involved in production operations, and the distribution channels for vehicles produced in Canada, Mexico, Brazil, and the Republic of Korea (Korea) are essentially the same as those in the United States. The number of automobile manufacturers in each producing country, based upon data compiled by Ward's Automotive Yearbook, are as follows:

<u>Country</u>	<u>Number of automobile producers</u>
Canada-----	6
Brazil-----	8
Mexico-----	7
Korea-----	<u>4</u>
Total-----	25

U.S. market

In the United States, demand for automobiles is concentrated in densely populated areas, primarily urban. At one time, brand loyalty and price were the primary factors considered in the purchase of an auto. But today's consumer is more concerned with quality, mechanical reliability, and fuel efficiency than about brand loyalty. The tendency to purchase the same make as previously owned is still an important factor, but it is not as important as it was during the 1940's through the 1960's.

Until the early 1960's, virtually all automobiles produced domestically were similar in size. U.S. manufacturers began producing smaller automobiles in significant numbers in 1959.

Automobiles are classified principally by size: subcompact, compact intermediate, standard, and luxury. In terms of size, consumer preferences have changed during the last 5 years. The following tabulation, based on data compiled from Automotive News, presents retail sales of domestically produced automobiles, by sizes, for 1978-83 (in percent):

<u>Year</u>	<u>Subcompact</u>	<u>Compact</u>	<u>Intermediate</u>	<u>Standard 1/</u>
1978-----	10.7	27.8	32.3	29.2
1979-----	16.4	26.8	30.4	26.4
1980-----	21.0	28.6	29.2	21.2
1981-----	23.5	27.8	28.0	20.7
1982-----	23.1	24.3	26.3	26.3
1983-----	29.8	13.6	33.1	23.5

1/ Includes luxury models.

The above tabulation indicates a significant shift in demand toward subcompact models and away from the other sizes during 1978-82. Due to the stabilization of fuel prices during late 1982 and 1983, some consumers switched from compact automobiles to intermediate models in 1983.

U.S. shipments

U.S. shipments of automobiles for selected years, compiled from statistics supplied by the Motor Vehicle Manufacturers Association, (in thousands of units) were as follows:

<u>Year</u>	<u>Automobiles</u>
1963-----	7,638
1967-----	7,437
1972-----	8,824
1977-----	9,201
1978-----	9,165
1979-----	8,419
1980-----	6,400
1981-----	6,255
1982-----	5,049
1983-----	6,780

Automobile shipments reached the highest level in 1973 when 9.7 million units were shipped. U.S. shipments of automobiles declined each year from 1978-82, due principally to the increase in the price of petroleum and the recessionary trends over the past years. However, U.S. shipments of automobiles for 1983 increased by 1.8 million units compared with 1982, due to the recovery of the U.S. economy during late 1982 and 1983.

U.S. imports 1/

U.S. imports of automobiles increased from \$445 million in 1963 to \$20.2 billion in 1982. The principal source of imports in 1963 was West Germany from which the United States imported 274,105 automobiles, valued at \$276.3 million. The primary source in 1982 was Japan from which the United States imported about 1.8 million automobiles, valued at \$9.6 billion. U.S. imports of automobiles from West Germany during 1982 remained at approximately the same level as that of 1963, in terms of units. 2/ The following table presents the number of automobiles imported from six principal sources, by specified years 1964 to 1983.

1/ U.S. import data reported in this section were obtained from official data of the U.S. Department of Commerce and closely parallels U.S. import data reported in table B-1 which were obtained from official statistics of the United Nations.

2/ In 1983, the United States imported 3.7 million automobiles valued at over \$24.1 billion.

Table 94.--New automobiles imported by 6 principal sources and all other countries, by specified years, 1964-83

(In thousands of units)								
Year	Japan	Canada	West Germany	United Kingdom	Sweden	Italy	All other	Total
1964-----	16	9	365	78	18	11	40	537
1967-----	70	324	472	68	43	17	26	1,020
1972-----	698	842	677	72	65	65	68	2,487
1977-----	1,342	850	423	57	39	55	24	2,790
1978-----	1,563	833	416	54	56	70	32	3,024
1979-----	1,617	677	495	47	66	72	30	3,004
1980-----	1,992	595	471	33	61	47	51	3,250
1981-----	1,912	564	376	13	68	22	44	2,999
1982-----	1,823	703	338	13	89	9	92	3,067
1983-----	2,112	837	330	53	109	5	220	3,666
	:	:	:	:	:	:	:	:

Source: Compiled from official statistics of the U.S. Department of Commerce.

The following tabulation, based on official statistics of the U.S. Department of Commerce and the Motor-Vehicle Manufacturers Association, shows the ratio, in terms of units and value, of imports of automobiles (total and Canadian, the only large source of automobiles of the countries discussed in this report) to U.S. consumption (in percent): 1/

Year	Ratio of imports to consumption		Ratio of imports from Canada to consumption	
	Units	Value	Units	Value
1963-----	6.6	3.5	0.0	0.0
1967-----	12.5	8.9	4.0	4.9
1972-----	22.8	18.2	7.7	9.4
1977-----	24.7	23.6	7.5	7.5
1978-----	26.4	23.5	7.3	7.3
1979-----	28.2	25.6	6.4	6.4
1980-----	35.0	31.6	6.7	7.0
1981-----	33.3	31.2	6.6	7.4
1982-----	38.5	37.2	9.3	10.3
1983-----	<u>1/</u> 37.2	<u>1/</u> 34.5	11.0	10.3
	:	:	:	:

1/ Estimated by the staff of the U.S. International Trade Commission.

Canada was the second largest source of automobile imports during 1979-83. As mentioned previously, automobile producers maintain assembly facilities in Canada and export fully assembled passenger cars to the United States. The types of automobiles imported from Canada range from subcompact to luxury models. (However, the majority of Canadian production is comprised of intermediate and luxury models.)

1/ Includes duty-free imports from Canada.

Although automobile production has increased in Mexico, Brazil, and Korea, there are presently no U.S. imports of new passenger automobiles from those sources. However, two subsidiaries of U.S. firms have plans to build compact models in Mexico and to import them into the United States, in order to compete more effectively against lower-priced Japanese lines already in the market.

In 1963 less than 4 percent of U.S. consumption of automobiles, in terms of value, was accounted for by imports, but by 1983 the percentage had climbed to 34.5 percent. In the case of Canadian imports, the ratio of imports to consumption (in terms of units) increased from an insignificant level in 1963 to 7.7 percent in 1972. During 1979-81, the ratio of Canadian imports to consumption (in terms of value) declined to under 7 percent, and then increased to 9.3 percent in 1982 and 11 percent in 1983. Much of the decrease in the import to consumption ratio for Canadian imports (in terms of units) during the late 1970's can be attributed to a decrease in U.S. demand for intermediate and luxury models. Most passenger automobiles produced in Canada are larger automobiles. During the early 1970's, the increase in fuel prices and fuel shortages contributed to a change in consumer preference, shifting demand from intermediate/luxury size models to smaller lower-priced subcompacts. Stable fuel prices and the related shift in demand back towards larger high-performance automobiles in the U.S. market during 1982 and 1983 contributed to the increase in Canadian imports.

Conditions of competition in the U.S. market

Canada was a significant source of U.S. imports of automobiles during 1983. Canadian exports of automobiles to the United States increased from 662,014 units in 1982 to 773,381 units in 1983. The heightened demand for large rear-wheel-drive cars, principally in the U.S. market, was responsible for the increase in Canadian shipments to the United States. Since the establishment of the Automotive Products Trade Act in 1965 that eliminated tariffs on new passenger car trade between the United States and Canada, the Canadian and U.S. industries have operated as one. The majority of new passenger cars produced in Canada are made in plants owned by subsidiaries of U.S. automobile firms. There is presently only one Canadian subsidiary of a European automaker, and that firm accounts for a small portion of Canadian production. The prices on Canadian-produced automobiles are generally the same as U.S.-produced automobiles, and the products are judged to be the equal in quality. Availability of parts and the cost of maintenance are also judged to be equal to that for U.S.-produced automobiles. Because of lower labor costs and the strong U.S. dollar, automobile producers have established new production/assembly plants and expanded existing facilities in Canada.

Presently, automobile producers in Brazil, Mexico, and Korea are not exporting new passenger cars to the U.S. market. Although there is presently no competition from these countries in the U.S. market, some major producers have entered the Canadian market and are expected to make an effort to capture a share of the U.S. market in the near future, according to Ward's Automotive Year Book.

International markets

Prior to 1977 the United States was the dominant producer in the world, followed by the European Community. However, in 1977 automobile production in the European Community exceeded that of the United States and has since maintained its dominant position. Furthermore, Japanese automobile production surpassed U.S. production in 1980 and has maintained a dominant position, second only to that of the European Community. The United States is ranked third, in terms of production. Canadian production is far behind the three dominant producers, as shown in the following tabulation based on data compiled by the Motor Vehicle Manufacturers Association (in thousands of units):

<u>Year</u>	<u>United States</u>	<u>European Community 1/</u>	<u>Japan</u>	<u>Canada</u>
1963-----	7,644	6,420	408	532
1967-----	7,413	6,811	1,376	708
1972-----	8,828	9,813	4,022	1,136
1977-----	9,214	9,428	5,431	1,120
1980-----	6,376	8,547	7,038	820
1981-----	6,253	8,105	6,974	796
1982-----	5,073	8,450	6,882	808
1983-----	6,782	9,279	7,152	955

1/ Includes 4 major motor-vehicle-producing countries.

The success of U.S. motor-vehicle manufacturers has been due primarily to their success in the U.S. market. Little emphasis has been placed on exporting, except to Canada. The primary reason the major U.S. motor-vehicle manufacturers have not pursued a more aggressive export policy is that they have production/assembly facilities in most of the major world markets. There are no U.S. production facilities in Japan and Korea (although a major U.S. manufacturer owns approximately 50 percent of a motor vehicle manufacturer in Korea).

Since the automobile market in Brazil and Mexico is closed to foreign-produced automobiles, domestic production of automobiles in these countries is virtually identical to their domestic consumption. In 1982, the largest producer of new passenger cars in Brazil was a subsidiary of a major West German firm. The next largest firms, in terms of passenger cars produced, were subsidiaries of two major U.S. automobile firms. The largest producer of automobiles in Mexico is a subsidiary of a major West German firm followed by two U.S. firms, one French firm, and two other U.S. firms.

The following tabulation, compiled from Ward's Automotive Year Book, 1983, lists the production of passenger cars in 1981, 1982 and 1983 for the major automobile producing countries (in thousands of units): 1/

1/ Data do not include Soviet-bloc production.

<u>Country</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>
Japan-----	6,974	6,887	7,152
United States-----	6,253	5,073	6,782
West Germany-----	3,578	3,761	3,878
France-----	2,612	2,777	2,961
Italy-----	1,258	1,297	1,396
Spain-----	855	927	1,142
United Kingdom-----	955	888	1,045
Belgium-----	852	950	972
Canada-----	803	788	955
Brazil-----	406	718	774
Sweden-----	258	295	345
Australia-----	352	230	312
Mexico-----	355	301	207
Korea-----	69	94	122
Portugal-----	61	65	66
All others-----	<u>2,438</u>	<u>2,361</u>	<u>2,333</u>
Total-----	28,079	27,412	30,442

A major indication of demand for motor vehicles is the number of motor vehicles registered in a country. The following tabulation, based on data from the Motor Vehicle Manufacturers Association, shows 1980 registrations of automobiles, by areas (in thousands of units):

<u>Area</u>	<u>Automobiles</u>
North and Central America-----	136,450
Europe-----	124,200
Asia-----	31,883
South America-----	14,234
Africa-----	7,414
Oceania-----	<u>6,332</u>
World total-----	320,513

U.S. exports

U.S. exports of automobiles increased from \$291 million in 1963 to peak at \$4 billion in 1981, and then decreased to \$2.9 billion in 1982. In 1963, the principal export market for U.S.-produced automobiles was Mexico, followed by Canada and Venezuela. However, since 1965, Canada has been the principal market for U.S. automobiles. In fact, automobile exports to Canada accounted for more than 79 percent of total U.S. exports to that country during 1981 and 1982. In 1982, other major markets for U.S. produced automobiles included Saudi Arabia, Kuwait, Japan, Venezuela, and West Germany.

Of the top markets for automobiles, the value of U.S. exports increased in one of the areas and decreased in the other seven areas when the value in 1977 is compared with that of 1982. The decline in exports during the last 3 years was caused by a decline in worldwide demand for U.S. vehicles brought about chiefly by the worldwide recession of 1980-82. Third-World developing countries, major purchasers of U.S. vehicles, have been especially hard hit by the recession.

Selected country exports

Canada.--Exports of automobiles from Canada increased from \$28 million in 1963 to \$5.9 billion in 1982 (table B-18). The United States, Saudi Arabia, and Kuwait were the three leading markets for Canadian-produced automobiles during 1982. The United States has been the principal market for Canadian automobile exports every year and accounted for 97 percent of all Canadian automobile exports during 1982.

Brazil.--Exports of automobiles from Brazil increased from \$122,000 in 1963 to \$460 million in 1982 (table B-17). The principal export markets for Brazilian automobiles in 1982 were Italy, Venezuela, Nigeria, and Peru. These four countries accounted for \$382 million, or over 83 percent of Brazil's total automobile exports in 1982.

Mexico.--Exports of automobiles from Mexico increased from \$78,000 in 1963 to \$90.7 million in 1979. The principal export markets for Mexican automobiles in 1979 were West Germany, Ecuador, and the United Kingdom. West Germany emerged as the largest export market for Mexican automobiles increasing from \$344,000 in 1972 to \$86 million, or over 95 percent of total Mexican exports, in 1979.

Korea.--Exports of automobiles from Korea increased from \$61,000 in 1963 to \$69.6 million in 1981. The largest export market for Korean automobiles in 1981 was Libya, which accounted for \$11.5 million, or over 16 percent of total exports. Other Korean export markets included the United Kingdom, Taiwan, and Saudi Arabia.

Conditions of competition in international markets

During the last 20 years, Japanese firms have increased their share of the world automobile market at the expense of U.S. and European producers. Although U.S. and European manufacturers have established assembly plants in many foreign countries, Japanese producers have concentrated most of their production/assembly operations in Japan. 1/

1/ One major Japanese automaker has established automobile assembly operations in Ohio and another Japanese manufacturer assembles light trucks in Tennessee. The manufacturer in Tennessee is considering producing automobiles at the same plant in which it is now manufacturing light trucks.

In the Canadian market, the strong competitive position of U.S. automobile firms is a result of the large investment by U.S. firms in the Canadian automobile industry and, until recently, the low level of import penetration from sources other than the United States in the Canadian market. Retail sales in Canada of automobiles produced in the United States or Canada increased from 69.2 percent of all retail sales in 1982 to 74 percent in 1983. The Canadian market is also dominated by imports from the United States. Canadian imports from the United States accounted for approximately 62 percent of Canadian automobile imports in 1983. Similarly, the United States is a major Canadian export market. Canadian exports to the United States represent approximately 97 percent of Canadian automobile exports. In 1984 a major Korean manufacturer began exporting passenger cars to the Canadian market. It is believed that the Korean company is using the Canadian market as a test market for future entry into the U.S. market, according to Ward's Automotive Year Book.

Competition in Mexico, Brazil, and Korea is, to a great extent, affected by government regulations. For example, in Mexico, a Government decree issued in September of 1981 forbade importation of all motor vehicles if they are similar to those manufactured within Mexico. In an attempt to deal with its balance of payments and debt problems, the Mexican Government has implemented domestic content laws and a host of other regulations intended to limit imports and has given incentives to promote exports. However, at this time passenger car exports from Mexico account for only 5 percent of the automobiles produced in Mexico. The Mexican market has been growing tremendously and is a much sought-after market thus the foreign investment in that closed market. Until the current downturn in demand, local producers could not manufacture enough cars to meet demand, and for this reason, there have been no Mexican exports. In addition, the price of their autos is not internationally competitive because of the lack of economies of scale of parts suppliers. A recent development in the motor vehicle industry is the establishment of engine assembly plants in Mexico. A large number of these engines are produced in Mexico and shipped to automobile assembly plants in the United States and Europe.

In the case of Brazil, the Brazilian Government has also imposed strict Government regulations governing the trade of automobiles. Brazilian import restrictions on automobiles are part of trade measures taken by the Brazilian Government to restrain a large current account deficit. Historically, Brazil has not been a competitor in world car production. However, as Brazilian production has increased, so has the ratio of automobile exports to production. During 1982, this ratio of exports, as measured in units, amounted to 18 percent of production.

In the case of Korea, the passenger car market is dominated by domestic producers. The largest producer accounted for 82 percent of passenger car sales in Korea. Korea is viewed by many automobile firms as a low-cost source for automobiles.

The countries covered in this report are all developing countries with lower labor costs than those in the United States (except for Canada). The following tabulation lists the hourly compensation cost index for production workers in various countries' in the motor-vehicle and equipment industries during 1983, as reported by the U.S. Department of Labor (U.S. =100 percent).

United States-----	100
Canada-----	72
Mexico-----	<u>1</u> / 14
Brazil-----	12
Korea-----	9

1/ Estimated, based on 1982 index.

Lower wage rates and benefits for automobile workers producing motorvehicles in Canada, Brazil, Mexico, and Korea is a contributing factor to the establishment of manufacturing facilities in those countries.

Crude Petroleum

Description and uses

Crude petroleum is a mixture of hydrocarbons that exists in natural underground reservoirs. It becomes liquid at surface atmospheric pressure after passing through surface-separating processes. For U.S. Customs purposes it includes reconstituted crude petroleum. 1/ In addition to paraffinic, 2/ naphthenic, 3/ and aromatic components, 4/ crude petroleum contains varying amounts of sulfur, nitrogen, and oxygen in the form of organic and inorganic compounds, such as organic and inorganic salts and organic metallic compounds. The presence of sulfur, nitrogen, and metallic compounds is undesirable because these compounds may lead to problems in refining, with the processing equipment, and with the refined products. Therefore, these components are either removed from the crude petroleum before it is refined or are converted into compounds that are relatively harmless.

Crude petroleum is produced by primary, secondary, and tertiary recovery methods. Primary recovery processes use the natural drive of either water or natural gas already present in the underground reservoir to force the crude petroleum out of the ground. As the natural drive begins to weaken, the well is usually equipped with a pump, which claims additional crude petroleum from the reservoir. Secondary processes involve pumping additional amounts of water or natural gas into a reservoir, which forces the crude petroleum up through the producing well.

Approximately 95 percent of the world's crude petroleum is produced by primary and secondary processes; however, these methods can only recover about 35 percent of the crude petroleum available in a reservoir. Tertiary recovery methods may be used to produce additional crude petroleum by employing chemical or thermal means to displace crude petroleum from the reservoir or by modifying the properties of the contents of the reservoir and/or the reservoir rock to cause production of additional crude petroleum.

1/ Reconstituted crude petroleum is a product that is essentially the equivalent of crude petroleum and that is made by adding fuel oil, naphtha, or other petroleum fractions to crude or topped crude petroleum.

2/ Paraffinic crudes refers to crude petroleum containing an appreciable amount of wax.

3/ Naphthenic hydrocarbons are also known as cycloparaffin. These are acrylic hydrocarbons in which three or more of the carbon atoms in each molecule are united in a ring structure.

4/ Aromatics are a group of hydrocarbon fractions that form the basis of most organic chemicals so far synthesized.

Crude petroleum is refined to produce consumer products, such as gasoline, fuel oils, jet fuel, and petrochemical feedstocks. The following tabulation shows the share of total crude petroleum accounted for by each of the major products obtained from crude petroleum in the United States (in percent): 1/

<u>Product</u>	<u>Share of total crude petroleum production</u>
Gasoline-----	44
Distillate fuel oil-----	20
Residual fuel oil-----	12
Jet fuel-----	7
Petrochemical feedstock <u>1/</u> -----	5
Still gas-----	4
Other <u>2/</u> -----	<u>8</u>
Total-----	100

1/ Includes naptha and other oils.

2/ Includes such products as lubricants, wax, coke, asphalt, liquefied gases, and kerosene.

U.S. industry profile

Most of the petroleum companies in the United States produce both natural gas and crude petroleum. Natural gas is often produced simultaneously with crude petroleum or, at times, instead of crude petroleum when exploration wells are drilled. Therefore, separate data in many areas on the crude petroleum industry are often not available. For example, Standard Industrial Classification (SIC) No. 1311 encompasses both crude petroleum and natural gas production.

The 1977 Census of Mineral Industries cites 6,217 companies operating a total of 8,573 establishments for SIC 1311. 2/ However, industry sources estimate that this number was low and that the number of U.S. firms engaged in the exploration and production of crude petroleum exceeded 19,000 in 1982.

1/ American Petroleum Institute, Basis Petroleum Data Book: Petroleum Industry Statistics, Washington, vol. II, No. 3, September 1982, sec. VIII, table 4a, and U.S. Department of Energy, Petroleum Supply Annual 1981, vol. 2, July 1982, table 15. An official of the American Petroleum Institute reported that 1982 was quite similar to earlier years.

2/ For Census purposes a crude petroleum or natural gas establishment covers all onshore crude petroleum and gasfield activities of an operating company in an entire State; offshore areas adjacent to a State, such as Texas or Louisiana; or offshore areas adjacent to several States, such as Pacific or South Atlantic offshore. Separate reports were required for each State of offshore area in which a company operated. These data include statistics for administrative offices, warehouses, storage facilities, and auxiliary units that service mining establishments.

All single-establishment companies with fewer than 5 employees were excluded from the Census mail canvas; all establishments with more than 10 employees were included. The cutoffs were selected so that the administrative records cases would account for approximately 3 percent of the value of shipments for the industry.

In 1982, there were 580,140 operational crude petroleum wells located in 31 of the 50 States, representing an increase of 12 percent compared with about 516,750 such wells in 1978. 1/ Texas and Oklahoma, in the aggregate, accounted for more than 48 percent of the total in 1982. Texas accounted for 32 percent of domestic wells in 1982.

Industry sources report that in 1981, the top eight firms accounted for more than 34 percent of the volume of production of crude petroleum, condensated liquids, and natural gas liquids. The top 15 firms together accounted for nearly 48 percent of the total. 2/ The top eight firms in 1977 represented 50 percent of the value of shipments and receipts and about 54 percent of the volume; the next eight firms represented an additional 19 percent of the value and about 20 percent of the volume that year. 3/ The independent producers are not involved in refining or marketing and reportedly account for about 30 to 35 percent of U.S. crude petroleum production annually. There were 160,700 workers employed in crude petroleum and natural gas production (SIC 1311) in 1982.

To the extent that any loss of domestic and/or international market share results from targeting practices, the corresponding absence of each million dollars in production not undertaken by U.S. petroleum and natural gas producers would translate into an estimated five workers displaced in all sectors of the U.S. economy (on the basis of 1982 production/employment relationships), according to the staff of the U.S. International Trade Commission, using the BLS input-output model, as seen in the following tabulation:

Industry sector	Employment
	<u>Number</u>
Petroleum and natural gas-----	2
Other manufacturing-----	1
All other-----	2
Total-----	5

1/ "Forecast-Review Issue," World Oil, February 1970 and February 1983.

2/ American Petroleum Institute, Market Shares and Individual Company Data for U.S. Energy Markets: 1950-81, Discussion Paper 014R, October 1982.

3/ The 1977 Census of Mineral Industries reports that for all establishments covered by SIC industry No. 1311, the top eight firms represented 45 percent of the value of shipments and receipts that year; the next eight firms represented an additional 17 percent.

Foreign industry profile

Canada.--Petro-Canada, the national petroleum company, was established in 1976 as a result of a Government move toward greater involvement in resource development. Petro-Canada obtained the operations of two major privately owned producers in 1978. 1/

Most of Canada's crude petroleum reserves are located in the western provinces and are estimated to be 6.73 billion barrels as of January 1, 1984. 2/ There are also extensive deposits (about 1 billion barrels of crude petroleum) in Alberta and Saskatchewan; however, these reserves are difficult and expensive to recover because of climate, terrain, and location in relation to markets. Also, crude bitumen in oil sands is estimated at more than 1 trillion barrels, but the technological problems associated with its recovery are formidable, and thus the capital costs would be high. 3/

Canada had 36,388 producing wells 4/ as of July 1, 1983. 5/ Crude petroleum production reached 1.4 million barrels per day in 1983, an increase of 12.5 percent from the 1982 levels. 6/ Canada operated 28 refineries to produce petroleum products in 1983. 7/

Mexico.--Petroleos Mexicanos (PEMEX) is the state-owned Mexican petroleum company formed in 1938 to maintain petroleum industry productivity after Mexico nationalized the industry and expropriated foreign investments. PEMEX was also designed to achieve such social goals as full employment, the stabilization of petrochemical and petroleum prices, and the satisfaction of domestic demand for petrochemicals.

Mexico's reserves of crude petroleum were estimated to be 48 billion barrels as of January 1, 1984. 8/ Mexico had 3,640 producing wells as of July 1, 1983, 9/ and production was estimated at 2.7 million barrels per day in 1983, a 1.7 percent decrease from 1982 production levels. 10/ Mexico operated nine petroleum refineries in 1983. 11/

1/ Dean Rusk Center, Comparative Facts on Canada, Mexico, and the United States, 1979, pp. 94-95.

2/ "Worldwide Report." Oil & Gas Journal, Dec. 26, 1983, p. 81.

3/ "Chemical Cooperation in Resources of the North American Continent," Chemical & Engineering News, Sept. 22, 1980, p. 35.

4/ Does not include shut in, injection, or service wells.

5/ "Worldwide Reports," Oil & Gas Journal, Dec. 26, 1983, p. 81.

6/ Ibid.

7/ Ibid.

8/ Ibid.

9/ Ibid.

10/ Ibid.

11/ Ibid.

U.S. market

Crude petroleum is used captively by the large, integrated petroleum-producing companies in the production of refined products such as gasoline, diesel fuel, jet fuel, kerosene, and other petroleum products. ^{1/} Price is a major factor influencing demand for refined products and the demand for these refined products creates a demand for crude petroleum. As the price of crude petroleum, and consequently refined products, increased, the market place turned to lower cost alternate fuels such as natural gas. Both U.S. consumers and industry turned toward greater energy efficiency and, in general, toward a policy of energy conservation.

U.S. production

Crude petroleum is produced domestically in a wide geographic area covering the length and width of the lower 48 States and Alaska. However, the major crude petroleum-producing States, in declining order of importance, are Texas, Oklahoma, Alaska, Louisiana, and California. In the aggregate, these five States annually have accounted for about 75 percent of the domestic production in recent years.

The level of U.S. production of crude petroleum remained virtually unchanged during 1978-83, declining from 3.2 billion barrels per year in 1978 to 3.1 billion barrels per year in 1979-81, and then increasing to 3.2 billion barrels per year in 1982 and 1983 as shown in the following tabulation, derived from official statistics of the U.S. Department of Energy (quantity in thousands of barrels; value in thousands of dollars; unit value in dollars per barrel):

<u>Year</u>	<u>Quantity</u>	<u>Value</u>	<u>Unit value ^{1/}</u>
1978-----	3,178,055	28,602,495	\$9.00
1979-----	3,121,480	39,455,507	12.64
1980-----	3,137,905	67,747,369	21.59
1981-----	3,128,780	99,401,340	31.77
1982-----	3,164,915	90,263,376	28.52
1983-----	3,159,440	82,745,734	26.19

^{1/} Actual domestic average wellhead price.

The level of domestic production of crude petroleum depends on changes in inventory levels, the level of imports, and the demand for petroleum products.

U.S. imports

U.S. imports of crude petroleum declined from 2.5 billion barrels in 1979 to 1.3 billion barrels in 1983; however, the value increased from \$46 billion in 1979 to \$62 billion in 1981 before declining to \$37 billion in 1983. The

^{1/} American Petroleum Institute, Market Shares and Individual Company Data for U.S. Energy Markets: 1950-1981, Discussion Paper 014R, October 1982, pp. 2 and 6.

following tabulation, derived from official statistics of the U.S. Department of Commerce, shows U.S. imports of crude petroleum from 1979 to 1983 (quantity in thousands of barrels; value in thousands of dollars; unit value in dollars per barrel):

<u>Year</u>	<u>Quantity</u>	<u>Value</u>	<u>Unit value</u>
1979-----	2,464,920	46,058,234	18.69
1980-----	1,974,774	61,899,003	31.34
1981-----	1,750,964	61,457,915	35.10
1982-----	1,416,884	45,723,820	32.27
1983-----	1,283,218	36,491,953	28.44

The leading sources of U.S. crude petroleum imports are Mexico, Nigeria, Saudi Arabia, and the United Kingdom. Most of the crude petroleum imports are the light, sweet crudes that contain a greater share of the valuable fractions used to produce gasoline and diesel fuel; also, most U.S. refineries are designed to process that type of crude petroleum. However, at times of light crude petroleum shortages, imports of heavy, sour crude petroleum can be refined but yield less of the lighter products and at a higher cost.

Since 1959, the importation of crude petroleum into the United States was affected by the Oil Import program, originally implemented by Presidential Proclamation 3279, effective March 10, 1959. 1/ The program was essentially designed, for security reasons, to preserve a vigorous, healthy petroleum industry in the United States and was originally intended to restrict imports via quotas to a level that did not threaten to impair the national security. The program involved such instruments as quotas, import licensing requirements, and license fees. At present, there are no such fees on the importation of crude petroleum, although importers must continue to obtain import licenses.

The U.S. Government maintains stocks of crude petroleum should there be a major interruption of crude petroleum imports; this program, known as the Strategic Petroleum Reserve (SPR), began in 1977. The ultimate goal of the SPR is to establish a reserve of 750 million barrels of crude petroleum. The SPR stocks in 1981 reached 230 million barrels of crude petroleum, more than twice the 1980 level. The SPR stocks reached 266 million barrels in 1982 and 339 million barrels in 1983. 2/ SPR imports in 1983 represented about 7 percent of the total daily crude petroleum imports, or about 234,000 barrels per day. 3/

1/ The action was taken under the authority of the national security provisions of the Trade Agreements Act of 1958 (now sec. 232 of the Trade Expansion Act of 1962, as amended). The President takes such action only after being advised by the appropriate Government officials that an investigation had been conducted and it had been found that crude petroleum was entering the country in such quantities and under such circumstances as to threaten to impair the national security.

2/ U.S. Department of Energy, Monthly Energy Review, March 1984, p. 45.

3/ Ibid., p. 44.

Conditions of competition in the U.S. market

During 1979 to 1983, U.S. apparent consumption of crude petroleum declined and imports accounted for a significant but declining share of the U.S. market as shown in the following tabulation (quantity in thousands of barrels):

<u>Year</u>	<u>Apparent consumption</u>	<u>Ratio (percent) of imports to consumption</u>
1979-----	5,423,660	45
1980-----	4,918,507	40
1981-----	4,702,234	37
1982-----	4,316,811	33
1983-----	4,157,222	31

The main reason for the decline in consumption was the rise in the price of domestically produced crude petroleum from \$12.64 per barrel in 1979 to \$26.19 per barrel in 1983. During the same period, the price of imported crude rose from \$18.69 per barrel to \$28.44 per barrel.

International markets

Besides the United States, the major world markets for crude petroleum are the industrialized nations of Western Europe, Japan, and Canada. These countries, with the exception of Canada, do not have significant reserves of crude petroleum or other conventional energy sources and thus rely on imports to satisfy domestic energy demand. As a result, most of these importing nations have refining industries that are capable of processing a wide variety of crude petroleum; this refining capacity gives these nations added flexibility of import sources.

U.S. exports

U.S. exports of crude petroleum are prohibited except as approved by the Federal Government. ^{1/} U.S. exports declined from 26 million barrels valued at \$394 million in 1979 to 6.8 million barrels valued at \$224 million in 1983

^{1/} The export of crude petroleum is restricted by the President under section 103 of the Energy Policy and Conservation Act, Public Law 94-163, dated Dec. 22, 1975. In matters of export control of crude petroleum, the President acts through the Secretary of Commerce, who imposes such restrictions as necessary to be consistent with the national interest and the purposes of this act. The Secretary enforces this provision of the act through the requirement of validated export licenses. The rules governing these exports are set forth in section 377.6, Petroleum and Petroleum Products, U.S. Department of Commerce, Export Administration Regulations, Dec. 7, 1981.

According to the U.S. Department of Commerce, exports of crude petroleum may also be controlled by three other acts: the Export Administration Act of 1979, Public Law 96-72, dated Sept. 29, 1979; the Naval Petroleum Reserves Production Act of 1976, Public Law 94-258, dated Apr. 5, 1976; and, the Trans-Alaska Pipeline Authorization Act, Public Law 93-153, dated Nov. 16, 1973.

as shown in the following tabulation, derived from official statistics of the U.S. Department of Commerce (quantity in thousands of barrels, value in thousands of dollars, unit value in dollars per barrel):

<u>Year</u>	<u>Quantity</u>	<u>Value</u>	<u>Unit value</u>
1979-----	26,079	394,036	15.11
1980-----	30,567	750,541	24.55
1981-----	16,447	576,795	35.07
1982-----	13,083	468,870	35.84
1983-----	6,781	224,089	33.05

Canada has been the only market for U.S. exports of crude petroleum since 1974, and most of these exports are composed of sweet, light crude petroleum. These exports are part of a commercial exchange agreement between the U.S. and Canadian refiners, which is approved by the U.S. Department of Energy. 1/

Canadian exports

The United States is virtually the only market for Canadian crude petroleum exports. Canadian exports to the United States increased from 103 million barrels valued at \$1.9 billion in 1979 to 101 million barrels valued at \$2.7 billion in 1983, as shown in the following tabulation, derived from official statistics of the U.S. Department of Commerce (quantity in thousands of barrels; value in thousands of U.S. dollars; unit value in U.S. dollars per barrel):

<u>Year</u>	<u>Quantity</u>	<u>Value</u>	<u>Unit value</u>
1979-----	102,748	1,872,178	18.22
1980-----	75,691	2,196,424	29.02
1981-----	57,188	1,928,184	33.72
1982-----	78,301	2,225,008	28.42
1983-----	101,000	2,664,691	26.38

Mexican exports

The United States is the major market for Mexican exports of crude petroleum, accounting for an average of 44 percent of total exports while Western Europe accounts for about 30 percent. The following tabulation shows Mexico's 1982 contracted crude petroleum exports by nation (in percent): 2/

1/ Alaskan North Slope crude petroleum may now be exported to an adjacent foreign country, Canada, to be refined and consumed therein in exchange for the same quantity of crude petroleum being exported from that country to the United States, provided that: (1) the exchange will result in lower prices for consumers of petroleum products in the United States; (2) within 3 months of the exchange, the transaction results in lower acquisition costs to the refiner than the refiner would have to pay for domestically produced crude petroleum in the absence of such an exchange; and (3) at least 75 percent of such savings in cost must be reflected in wholesale and retail prices of products refined from such imported crude petroleum.

2/ "Oil Exports Buck the World Trend" and "Search Proves Abundance of Hydrocarbons," Financial Times, Mar. 22, 1982, pp. IV and V.

<u>Country/region</u>	<u>Total crude petroleum exports</u>
Brazil-----	3.6
Canada-----	3.0
Central America and Caribbean-----	4.3
France-----	6.1
Israel-----	4.6
Italy-----	4.8
Japan-----	8.2
Korea-----	1.2
Philippines-----	0.6
Portugal-----	0.6
Spain-----	12.7
United Kingdom-----	5.4
United States-----	44.3
Uruguay-----	0.6
Total-----	100

Since Mexico's trade is dominated by the United States, Mexico limited crude petroleum exports to the United States to 50 percent of total exports in 1982 in an effort to diversify its trading partners. The following tabulation shows Mexican crude petroleum exports to the United States during 1979-83 (quantity in thousands of barrels; value in thousands of U.S. dollars; and unit value in U.S. dollars per barrel):

<u>Year</u>	<u>Quantity</u>	<u>Value</u>	<u>Unit value</u>
1979-----	162,740	3,038,461	18.67
1980-----	194,172	5,923,589	30.51
1981-----	177,510	5,892,686	33.20
1982-----	264,988	7,563,362	28.54
1983-----	285,436	7,520,719	26.35

The increase in Mexican crude petroleum exports to the United States is the result of a 5-year contract, which began in August 1981 and required Mexico to export an average of 160,000 barrels per day to the United States for the SPR.

Conditions of competition in international markets

U.S. exports of crude petroleum are prohibited; thus, the United States does not compete with Canada or Mexico in international crude petroleum markets. ^{1/}

^{1/} For information on the restriction of U.S. crude petroleum exports, see the "U.S. exports" section of this report.

Drugs and Related Products

Description and uses

Drugs and related products include numerous chemicals and natural products. Many drugs are organic chemicals that are found in plants or secreted by various animal glands. Other drugs, such as the antibiotics, are chemicals produced in part by fermentation processes. Also, many drugs are now produced entirely by chemical synthesis. Lastly, included in this description are related products such as vaccines, toxoids and analogous products, serums, plasmas, and other blood derivatives.

The drugs and related products are sold in a variety of forms--(1) crude natural products, (2) chemically pure bulk drugs, (3) pharmaceutical preparations, such as tablets, capsules, vials, ointments, and medicinal powders, and (4) various other medicinal products that are suitable for retail sale.

U.S. industry profile

The production of drugs and related products takes place in two major manufacturing stages. The first stage is the production of pure pharmacologically active chemicals in bulk form; the second stage is the formulation of these concentrated pharmacologically active components into pharmaceutical preparations. Pharmaceutical preparations are typically the pure chemicals plus diluents or extenders.

The purchasers or users of bulk drugs are, for the most part, the establishments that produce pharmaceutical preparations. Many of these produce bulk drugs for their own captive use in the production of their brand name pharmaceutical preparations. Ultimately, drugs and related products are consumed by the general populace in the form of pharmaceutical preparations, are used in animal feed additives, or are used in veterinary medicine.

Distribution channels for drugs and related products vary with the markets or users being served. For example, substantial amounts of bulk drugs move in international trade, and a significant part of these shipments are believed by industry sources to be intracompany product transfers by multinational drug firms. In addition, producers of bulk drugs ship products directly to producers of pharmaceutical preparations. Also, some medicinals, such as vitamins, are shipped in bulk form directly to customers, who add these products to animal feeds. Prescription pharmaceutical preparations are dispensed through pharmacies, and over-the-counter products are sold to consumers through numerous retail outlets. Thus, distribution of pharmaceutical preparations varies with the type of product.

There were 174 U.S. establishments in 1980 (compared with 177 in 1977 and 140 in 1972) that produced bulk medicinals and botanicals. 1/ 2/ This bulk medicinal and botanical industry employed a substantial number of highly trained individuals with high skill levels. Total employment in this industry was 16,000 in 1982, up 11 percent from the 14,400 employees in 1977 and up 105 percent from the 7,800 employees in 1972. 3/

Also, in 1980 there were 631 establishments producing pharmaceutical preparations compared with 756 in 1977 and 1972. Thus, over the past few years, the pharmaceutical preparations industry has become somewhat more concentrated. A wide range of skill levels is required. Industry employment totaled 138,500 in 1982, up 10 percent from the 126,400 employees in 1977 and up 24 percent from the 112,000 employees in 1972.

Also, in 1980, there were 287 establishments, compared with 310 in 1977 and 182 in 1972 producing biological products. The labor force in the biological products industry was not so highly skilled as those in the bulk drugs and pharmaceutical preparations industries, if wage rates are used as an indicator. Total employment in the industry producing biological products was 22,600 in 1982, up 44 percent from the 15,700 employees in 1977 and up 124 percent from the 10,000 employees in 1972.

A limited amount of data is available for other related chemicals. At least 20 firms produced other products [and the employment figure was estimated to be between 2,000 and 3,000 workers.]

In total, an estimated 1,112 establishments produced drugs and related products in 1980; 1,263 in 1977; and 1,098 in 1972. Total employment was estimated at 180,000 workers in 1982; 159,000 in 1977; and 132,000 in 1972.

To the extent that any loss of domestic and/or international market share results from targeting practices, the corresponding absence of each \$1 million in production not undertaken by U.S. drugs manufacturers would translate into an estimated 26 workers displaced in all sectors of the U.S. economy (on the basis of 1982 production/employment relationships), according to the staff of the U.S. International Trade Commission, using the BLS input-output model, as seen in the following tabulation:

Industry sector	Displaced employment
	<u>Number</u>
Drugs and related products-----	9
Other manufacturing-----	5
All other-----	<u>12</u>
Total-----	26

1/ U.S. Department of Commerce, County Business Patterns-1980, September 1982, p. 28.

2/ U.S. Department of Commerce, Census of Manufactures, 1972 and 1977.

3/ U.S. Department of Commerce, U.S. Industrial Outlook, 1983, January 1983, p. 14-3.

Foreign industry profile

Brazil.--The majority of the 78 companies producing pharmaceuticals in Brazil are affiliated in some manner with foreign-based firms. Approximately 30 percent are European-owned and more than 40 percent are U.S.-owned. 1/ Total sales of the Brazilian industry during 1977 are estimated at approximately \$1.4 billion. 2/ Capacity data cannot be estimated with an acceptable degree of accuracy. Employment data are also unavailable. Retail prices for pharmaceuticals are strictly controlled by the government. Increases are held to approximately two-thirds the rate of Brazilian inflation. The Brazilian per capita consumption of pharmaceuticals reached \$13.66 in 1977. 3/

Korea.--In 1982, the Korean pharmaceutical industry produced goods valued at \$1.5 billion, although pharmaceutical raw materials accounted for only 10 percent, or approximately \$139 million. 4/ This represents an approximate average annual growth rate of 27 percent as the Korean pharmaceutical industry produced approximately \$450 million worth of pharmaceuticals in 1977; about 10 percent of this production represented traditional herbal medicines, with or without modern drug components. In 1982 there were 276 Korean manufacturers, an increase from 1977 when there were 272, though down from 482 in 1964. The top 20 manufacturers accounted for approximately 67 percent of all pharmaceuticals produced in Korea in 1982. 5/ The Korean industry employed 35,900 workers in 1982. 6/ Capacity data are not available.

Since 1977, the Korean Government has acted to improve the competitive climate in their domestic pharmaceuticals market by allowing greater foreign investment and providing incentives to encourage mergers among the smaller domestic manufacturers.

Mexico.--In 1977, there were 770 pharmaceutical companies operating in Mexico, generating revenues estimated at \$873 million; 50 multinational producers in Mexico accounted for 90 percent of the production and supplied 85 percent of the domestic market. However, in 1984 only 314 laboratories were operating, 75 of which were internationals and 50 of which were based in the United States. Transnationals now account for 72 percent of the value of the pharmaceutical market in Mexico. Government efforts aimed at strengthening the domestic industry through price ceilings and "Mexicanization" between 1974 and 1979 had other side effects. At the end of the 5-year program, a complex drug-pricing structure existed, drug shortages were documented to have risen to 30 percent of established needs, and the level of new foreign investments were valued at 20 percent of their level in 1974. Capacity and employment data are unavailable.

1/ "Aspects of developing the pharmaceutical industry in Brazil," Appropriate Industrial Technology for Drugs and Pharmaceuticals, United Nations Industrial Development Organization, 1980, pp. 138-141.

2/ Ibid.

3/ Ibid.

4/ Korean Pharmaceutical Industry Association, Pharmaceutical Industry in Korea, 1983.

5/ Ibid.

6/ Ibid.

Taiwan.--The bulk of Taiwan's pharmaceutical industry is made up of firms associated with multinationals. However, the size of the Taiwanese industry remains small, even when compared with other developing countries' industries. The value of pharmaceuticals produced in Taiwan is estimated by industry experts to be between \$200 million and \$250 million. No other information concerning the Taiwanese industry is available.

U.S. market

As previously mentioned, purchasers or users of bulk drugs are, for the most part, establishments that produce pharmaceutical preparations. And many of these firms produce bulk drugs for their own captive use in the production of their brand-name pharmaceutical preparations. For those producers of pharmaceutical preparations that purchase bulk drugs, price is the major determining factor in their selection of a supplier, and reliability of supply is the second most important consideration. New product development also plays an important role in the success of a competing firm in the market.

Likewise, the aging of the population has influenced the demand for drugs. The average age of the U.S. population has been increasing. The occurrence of many human diseases, especially chronic ones, is a function of age, and, consequently, this is a major factor affecting increased demand for pharmaceutical preparations, along with increased demand for health services.

Apparent U.S. consumption of drugs and related products is estimated to have increased 85 percent during 1977-82, from about \$13 billion in 1977 to \$25 billion in 1982. Previously, U.S. apparent consumption increased about 74 percent during 1972-77. In part, the increase in value of consumption is accounted for by inflation, because the same products cost more in 1982 than in preceding years. The introduction of new and more costly prescription drugs during the period has also contributed to the increase in value. Pharmaceutical preparations accounted for a significant part, 83 percent, of the value of consumption in 1982.

U.S. shipments

U.S. shipments of drugs and related products are estimated to have increased 83 percent during 1977-82 and 78 percent during 1972-77, from \$8 billion in 1972 to \$14 billion in 1977 and \$26 billion in 1982. As with consumption, the increase in value is largely accounted for by inflation and the introduction of new and more costly prescription drugs.

U.S. imports

U.S. imports of drugs and related products increased 67 percent during 1977-82, from \$657 million in 1977 to \$1.1 billion in 1982. Major sources of U.S. imports were the United Kingdom, West Germany, and Japan, each of which exported more than \$100 million in drugs and related products to the United States in 1982. The rate of increase in imports during 1978-82 was lower than

that for U.S. shipments, including products for exports, because much of the imports contained relatively low-cost medicinal chemicals in bulk form, whereas U.S. shipments included substantial amounts of higher valued pharmaceutical preparations.

Imports from Brazil, Korea, Mexico, and Taiwan, together increased from a value of \$21 million in 1977 to \$26 million in 1982, or by 24 percent. During the same period, the ratio of imports to U.S. consumption ^{1/} declined from 0.16 percent to 0.11 percent, indicating the minimal effect these imports have on the U.S. market.

Conditions of competition in the U.S. market

Most imported drugs are like or directly competitive with domestically produced drugs, although the U.S. market is not a likely market for pharmaceuticals produced in the nations being examined. All drugs, domestic and foreign, must meet minimum Food and Drug Administration (FDA) requirements for safety and efficacy in order to be marketed in the United States. Most imported drugs enter the United States in bulk form. There are two reasons for this-- (1) it is less costly to ship material in its pure concentrated form, and (2) there is a preference for domestically produced pharmaceutical preparations among physicians who prescribe drugs and retail consumers. Thus, most imported drugs are either imported by multinational firms that have U.S. subsidiaries or are sold to U.S. producers of pharmaceutical preparations or other users of bulk drugs.

International markets

The United States was the world's largest (\$11.3 billion) market for pharmaceutical preparations in 1979, followed by Japan (\$8.3 billion), West Germany (\$5 billion), France (\$4 billion), Italy (\$2.4 billion), the United Kingdom (\$1.8 billion), and Spain (\$1.6 billion). ^{2/}

National firms are quite prevalent in the drug industry, and these firms tend to view their markets as world markets and their firms as world firms. Thus, there are significant amounts of intracompany product transfers in pharmaceuticals owing to varying economies of scale in plant operations, tax advantages, and other advantages related to multinational operations.

According to the United Nations trade statistics, world exports of medicaments--Standard International Trade Classification (SITC) No. 541.7--were \$9.9 billion in 1980. Of the 1980 world exports of medicaments, West Germany accounted for 18 percent; the United Kingdom, 15 percent; France, 15 percent; Switzerland, 13 percent; and the United States, 9 percent. Developed market economy countries accounted for 97 percent of exported medicaments in 1980 and 63 percent of world market economy imports. Developing market economy countries accounted for the balances. ^{3/} Although the United States

^{1/} Imports from Brazil, Korea, Mexico, and Taiwan.

^{2/} U.S. Department of Commerce, U.S. Industrial Outlook, 1982, January 1982, p. 135.

^{3/} United Nations, 1980 Yearbook of International Trade Statistics, vol. II, 1981, p. 441.

is the world's largest market for drugs, it is only the fifth largest exporter of these products. This clearly illustrates the competitive strength of the European drug producers, while the nations in question together represent approximately one-hundredth of one percent of world exports.

Medicaments, which roughly approximates pharmaceutical preparations, represent only a portion of the drugs and related products trade. Comparable world data for all drugs and related products are not available. However, United Nations data are available for certain drugs (such as antibiotics, hormones, and alkaloids) in bulk form. But international data for SITC No. 541, medicinal and pharmaceutical products, only cover part of the drugs and related products because many of the drugs in bulk form are classified as organic chemicals in the SITC classification system.

U.S. exports

U.S. exports of drugs and related products increased 59 percent during 1977-82, from \$1.5 billion in 1977 to \$2.3 billion in 1982. Principal U.S. export markets in 1982 were Japan (21 percent), France (8 percent), Canada (7 percent), West Germany (6 percent), and Belgium (5 percent). The United States had a positive trade balance in these products in 1982, with U.S. exports approximately double U.S. imports. Exports accounted for about 9 percent of estimated U.S. shipments in 1982.

The United States has maintained a positive growth in the exports of drugs and related products, because many U.S. production facilities are large enough to supply world markets in addition to supplying the domestic market. Another factor influencing the continued export growth is that most large U.S. drug firms have established impressive reputations as suppliers of safe and effective pharmaceutical preparations. Additionally, many multinational firms ship drugs in bulk form to the United States and then export pharmaceutical preparations made from the bulk drugs.

Selected country exports

Brazil.--As discussed in the section on international markets, Brazilian export data are not directly comparable with official U.S. import data compiled by the Department of Commerce, owing to substantial differences in the U.S. classification systems, the Standard International Trade Classification system, and the Customs Cooperation Council Nomenclature (CCCN) system used by most nations. Nevertheless, the SITC data are relied on for the examination of trends, even though these data do not include all trade bulk drugs, the predominant form in which drugs and related products are imported into the United States. These data are believed to reflect historical trends in total trade.

In 1982, Brazil's major pharmaceutical export markets were West Germany and Argentina, each accounting for approximately 17 percent of exports of medicaments (table B-39). Other important export markets were the United States (8 percent); Venezuela (7 percent); Panama (6 percent); Mexico (6 percent); Paraguay (5 percent); and Colombia (5 percent). Brazilian exports to the United States increased by 271 percent during 1977-82.

Korea.--Exports of pharmaceuticals from Korea increased from \$2.5 million in 1972 to \$26.2 million in 1981, or by 943 percent. Korea's major export market for pharmaceuticals is Japan, as indicated by SITC data showing 29 percent of medicaments exported to Japan in 1981 (table B-40). Other major markets are Hong Kong (8 percent); Pakistan (7 percent); Mexico (6 percent); the United States (5 percent); and Italy (4 percent).

Mexico.--Mexican exports increased by 77 percent, from a value of \$27 million in 1972 to \$48 million in 1977 (table B-41). Mexico's largest market in 1977 was the United States, which accounted for 25 percent of Mexico's pharmaceutical exports, followed by West Germany (17 percent); Panama (7 percent); and El Salvador, Honduras, and Guatemala (together accounting for 11 percent).

Taiwan.--Available SITC statistics on exports of pharmaceuticals from Taiwan indicate that there were small amounts exported in 1963, 1967, and 1972; however, no exports were reported in 1977 (table B-42).

Conditions of competition in international markets

The United States is currently in a favorable competitive position in terms of raw material cost and availability of organic chemicals used to produce drugs and related products. Still, in general, all major industrialized countries have access to the requisite raw materials used to produce drugs and related products. However, in most instances, raw material costs are not the principal factor in determining the location of manufacturing facilities. More important factors are proximity and other inducements for capital investments, skill levels of available workers, and corporate structure.

Furthermore, basic and process technologies are both important for a competitive edge. The high-profit margins of the drug industry, compared with other segments of the chemical industry, are directly related to a constant flow of significant drug discoveries. An individual drug that is a significant new therapeutic development can be immensely profitable for a drug firm, though to discover, test, produce, and market the new drug requires large expenditures. For these reasons, major U.S. drug firms employ some of the most advanced state-of-the-art technology in the world. As previously mentioned, these leading firms are multinational corporations, and there is considerable technology transfer between the parent company and its foreign subsidiaries. Advanced drug technology, therefore, is not the exclusive purview of U.S. firms but is generally available to most major competitors. In 1982, for example, West Germany ranked first in new drug introduction; Spain, second; and Italy, third. The United States was not among the top 10 countries on the basis of new drug introductions in 1982. ^{1/}

^{1/} "Ciba-Geigy ousts Hoechst from top of drug launch league table," European Chemical News, July 18, 1983, p. 19.

Heavy Electrical Equipment

Description and uses

Heavy electrical equipment is generally recognized by the National Electrical Manufacturers Association (NEMA) and its U.S. members as being composed of four categories of products. These categories are (1) power circuit breakers rated at 242 kilovolts (KV) and greater, (2) power transformers rated over 10 kilovoltamperes (10 KVA), (3) land, steam turbine generator units rated at 10 million watts (10 MW) and greater, and (4) land, gas turbine generator units rated at 5 MW and greater. Although hydroelectric generating units are also commonly classified as heavy electrical equipment, U.S. production of this equipment is currently minimal.

The first category, power circuit breakers, are devices that protect other electrical equipment from catastrophic failure in the event of an excessive circuit overload. The second category, power transformers, are electrical devices that are used primarily to step up (increase) or step down (reduce) generator output and powerline voltages. Generator output voltages are stepped up for long-distance electrical transmission to reduce power losses that are lower at higher voltages. At the end of the high-voltage transmission, stepdown transformers are used to lower the line voltage.

The remaining categories, turbine generator units, are principally of two types of land-based systems--steam or gas driven. In the steam turbine, oil, coal, or nuclear fuel is used to produce high-pressure steam, which runs a generator. Compared with steam turbines, gas turbines are smaller and more self-contained. Gas turbines use a compressor to force air into a combustor, where it is mixed with fuel and heated. The expanded gaseous byproducts are then directed through the turbine. Gas turbine generators are relatively simple and compact devices, making them an ideal source of standby or emergency power. Steam turbine generators are, on the other hand, commonly employed in large electric-generating power stations.

U.S. industry profile

The U.S. heavy electrical industry consists of about 10 producers, none of which are owned by Brazilian or Korean companies. The two leading U.S. producers account for a large share of industry shipments. The two firms produce a full line of heavy electrical equipment for U.S. and foreign markets. Other U.S. producers typically specialize in a few product areas and, in most cases, do not approach the scale of operations of the industry leaders.

The concentration of the industry is principally related to the nature of production operations. Production of heavy electrical equipment, with the possible exception of lower voltage circuit breakers and transformers, is very capital intensive. Replacement values for certain production process equipment can range from \$1 million to \$30 million. Production leadtimes range from 6 months to a year for a power circuit breaker and up to 5 years for a large steam turbine generator unit. As progress payments are rare in this industry, producers, for the most part, must sustain the heavy costs of substantial work-in-process inventories.

Workers employed in this industry are predominantly highly skilled blue-collar machinists and assembly workers, and white-collar engineers and management specialists. (Blue-collar workers are trained through lengthy apprenticeships and on-the-job training programs.) A high degree of craftsmanship is embodied in many of the production and assembly operations. Employment in the industry declined from approximately 37,000 persons in 1978 to 29,000 persons in 1982, or by approximately 22 percent (table B-63). Production and related workers declined from nearly 28,000 workers in 1978 to slightly over 21,000 workers in 1982, or by approximately 25 percent.

On the basis of 1981 production employment relationships, each \$1 million in production of heavy electrical equipment undertaken by U.S. firms translates into an estimated \$2.2 million in production in all sectors of the U.S. economy and approximately 30 jobs created, as shown in the following tabulation: 1/

Industry sector	Employment	Output lost
	<u>Number of employees</u>	<u>Million dollars</u>
Heavy electrical equipment-----:	15 :	1.0
Other manufacturing-----:	8 :	.9
Other-----:	7 :	.3
Total-----:	30 :	2.2

About half of these jobs reside in the heavy electrical equipment sector.

Foreign industry profile

Korea.--The heavy electrical equipment industry in Korea has been sponsored and extensively underwritten by the Korean Government. Korea Heavy Industries and Construction Company (KHIC), the only domestic manufacturer of turbine generators, is almost 100-percent owned by the Korean Government. KHIC is a subsidiary of the Korea Electric Power Corporation (KEPCO), the state-owned power monopoly. KEPCO, in turn, owns and operates all of the nuclear and fossil-fuel-fired power plants in Korea. The only other Korean producer of heavy electrical equipment is Hyosung Heavy Industries (Hyosung).

1/ These estimates are based on the Bureau of Labor Statistics (BLS) input-output model. In the BLS model, certain components of heavy electrical equipment are counted double; therefore, the "output lost" data are overstated.

Hyosung was established by a Korean Government decree as the domestic producer of power transformers and circuit breakers. Both KHIC and Hyosung have benefited considerably from the transfer of technology from foreign equipment vendors. While the two companies have begun to depend less on outside technology sources, KHIC, in particular, is still heavily reliant on the technical expertise of U.S., French, West German, and Canadian producers. Foreign observers, however, have great respect for the Korean industry's accomplishments and the industry's increasing ability to perform "inhouse" research and development.

Brazil.--Since 1978, Brazil's heavy electrical equipment industry has evolved into a modern, technologically sound industry. The industry plays an important role in Brazil's economy. The industry's evolution has been aided by the enactment of import substitution policies and government support of indigenous producers. Support of Brazil's domestic industry arose out of an acknowledged need to become less dependent on foreign fossil fuels by developing new internal sources of energy--principally hydroelectric power. At the same time, the rapid industrialization and electrification of Brazil has added to the debt and balance of payments crisis, which prompted the Brazilian Government to require foreign equipment vendors to transfer production technology into the country. As a result of these policies, Brazil has reduced its dependency on foreign imports, and currently imports only 10 to 20 percent of its annual electrical equipment needs. Eletrobras is the arm of the government that is directly responsible for coordinating Brazilian electrical utility activities and developing the electric power system.

The heavy electrical sector of the Brazilian electric power equipment industry currently consists of about 12 producers. A number of these concerns are subsidiaries of large foreign equipment producers that receive capital and technology from their parent companies.

U.S. market

The principal U.S. purchasers of heavy electrical equipment are public and investor-owned electrical utilities and electric cooperatives, which currently number in excess of 200 entities. Approximately 80 of these utilities are responsible for nearly 95 percent of total U.S. purchases. U.S. and foreign producers of heavy electrical equipment market their equipment in essentially the same manner.

Since 1973, many U.S. utilities have experienced increasing pressure on their profitability as the result of almost an eightfold increase in the prices of fossil and nuclear fuel. This rise in cost has only been partially passed on to consumers. As a result of these inflationary pressures and the substantially increased cost of financing the construction of new generating and transmission facilities, utilities have been taking a hard look at long- and short-term equipment purchases. Consequently, many purchases are either being deferred or canceled, and existing and proposed orders are being reevaluated by utilities.

The provisions of the Buy America Act have benefited U.S. producers of heavy electrical equipment to a limited extent but only with respect to business solicited by federally operated power authorities. This act authorizes such utilities to purchase U.S.-produced equipment when the bids on such equipment are no more than 6 percent higher than bids by foreign suppliers. An additional 6 percent differential is accorded a U.S. producer that manufactures the equipment in a designated labor surplus area. Such an area would be one in which the unemployment rate is above a specified level.

U.S. shipments

U.S. producers' shipments of heavy electrical equipment declined from \$1.3 billion in 1978 to \$1.1 billion in 1979 then gradually increased to approximately \$1.2 billion in 1982 (table B-63). These shipments were predominantly of steam turbine generator units and power transformers. The decline in shipments in 1979 was largely due to ripple effects within the U.S. utility industry triggered by the rising price of fossil fuels. The value of shipments of heavy electrical equipment since 1979 has grown at only a 2- to 3-percent annual rate as a result of decreased demand for electrical power.

U.S. imports

U.S. imports of circuit breakers rated at 242 KV and greater increased from \$2.1 million in 1978 to \$10.7 million in 1980, but then declined to an estimated \$6.2 million in 1982 (table 95).

Table 95.--Circuit breakers rated at 242 KV and greater: U.S. imports
for consumption, by principal sources, 1978-82

(In thousands of dollars)						
Source	1978	1979	1980	1981	1982 ^{1/}	
France-----	1,579	3,541	6,173	4,603	2,500	
Switzerland-----	-	1,181	1,118	1,960	1,800	
Japan-----	514	1,255	2,734	2,862	1,500	
All other-----	39	-	630	243	400	
Total-----	2,132	5,977	10,655	9,668	6,200	

^{1/} Estimated by the staff of the U.S. International Trade Commission.

Source: Compiled from official statistics of the U.S. Department of Commerce and from data submitted in response to questionnaires of the U.S. International Trade Commission in investigation No. 332-144, except as noted.

The decline in circuit breaker imports in 1981 and 1982 was the result of substantial reductions in the value of contracts awarded by U.S. purchasers to foreign producers in 1980 and 1982.

Imports of transformers rated over 10,000 KVA increased 91 percent from \$16.4 million in 1978 to \$31.4 million in 1980, declined to \$21.4 million in 1981, then increased to \$26.3 million in 1982 (table 96).

Table 96.--Transformers rated over 10,000 KVA: U.S. imports for consumption, by principal sources, 1978-82

(In thousands of dollars)						
Source	1978	1979	1980	1981	1982	
Canada-----	3,871	10,255	10,826	6,764	11,193	
West Germany-----	3,022	4,180	4,674	4,848	8,249	
Austria-----	-	749	2,464	1,317	3,048	
The Netherlands-----	-	-	-	433	1,709	
Japan-----	1,760	-	3,948	3,307	879	
Sweden-----	6,529	3,648	7,350	4,480	151	
All other-----	1,242	1,003	2,090	271	1,031	
Total-----	16,424	19,835	31,352	21,420	26,260	

Source: Compiled from official statistics of the U.S. Department of Commerce and from data submitted in response to questionnaires of the U.S. International Trade Commission in investigation No. 332-144.

The overall increase for 1978-82 was 60 percent. The decline in imports during 1981 and 1982 from the peak in 1980 was the result of reduced contracts placed by U.S. purchasers in 1979 and 1980 for foreign equipment. During 1978-82, Canada was the leading foreign source of power transformer imports, principally of equipment from Canadian subsidiaries of U.S. producers.

Imports of land, steam, and gas turbine generator units are virtually impossible to ascertain because of the lack of appropriate U.S. import reporting provisions and the pervasive practice whereby most importers separate this equipment into major subassemblies and parts in order to facilitate its shipment. Subassemblies and parts are commonly entered in stages as construction proceeds on a power generating station. Imports of steam and gas turbine generator units are believed to have been negligible between 1978 and 1982.

U.S. imports of heavy electrical equipment from Korea and Brazil were negligible during 1979-83.

Conditions of competition in the U.S. market

The depressed condition of the U.S. heavy electrical equipment market is not expected to improve significantly during the next 5 years. With electric power consumption experiencing a low growth rate and with utility generating reserve margins expected to remain high in the near term, less generation and distribution equipment will thus be required by purchasers.

The depressed U.S. heavy electrical market and excess production capacity worldwide have led to intense price competition between U.S. and foreign competitors. However, to date, this competition has been principally from producers in the European Community and Japan.

With respect to the current competitive position of U.S. producers of heavy electrical equipment in the U.S. market compared with that of their counterparts in Brazil and Korea, U.S. producers currently acknowledge an advantage in U.S. labor productivity, product technology, and raw materials costs. However, U.S. producers indicate that producers in Korea and Brazil do have a labor cost advantage and their industries operate in protected home market environments. The general consensus of U.S. heavy electrical equipment producers, however, seems to be that neither Brazilian nor Korean producers are presently capable of competing effectively in the United States. On the other hand, U.S. sources indicate that in the next 5 to 10 years, this situation could change, particularly with regard to Korean manufacturers.

International markets

The principal world markets for heavy electrical equipment are the United States, the U.S.S.R., Japan, the EC, and certain developing nations of the world (principally the organization of petroleum exporting countries and emerging industrialized countries including Brazil and Korea). The three leading industrialized countries, in terms of net installed capacity of electric generating plants (the United States, the U.S.S.R., and Japan), accounted for 55 percent of world generating capacity in 1979. Demand for additional electric power generating capacity and, thus, for heavy electrical equipment in these and other industrialized countries is not increasing as rapidly as it is in the developing countries.

Brazil was the only developing nation among the leading 25 countries of the world in terms of net installed generating capacity in 1979. At that time, Brazil ranked 10th with 1.7 percent of total world generating capacity, while Korea ranked 28th, with less than .5 percent. The developing countries accounted for approximately 13 percent of world capacity. The demand for additional capacity, and, hence, heavy electrical equipment, is growing at a much faster rate in developing countries than in developed countries. This is the result of ambitious electrification and industrialization efforts, which are being undertaken in developing countries. The developing countries currently account for nearly one-third of the total world demand for new generating equipment. While Brazil's efforts have been concentrated in the development of hydroelectric facilities, Korea, which has few water resources, has opted for the development of nuclear power plants. The expansion of the electrical systems in these two countries has, with the help of national procurement practices, provided indigenous producers with a considerable production base, and economies of scale.

U.S. exports

U.S. heavy electrical equipment exports increased from \$390.2 million in 1978 to \$791.6 million in 1980, declined to \$554.5 million in 1981, then increased to an estimated \$570.0 million in 1982 (table B-63). Mexico and Canada were the leading foreign markets throughout 1978-82, followed by Saudi Arabia. Brazil and Korea were not important export markets during the period. Exports became increasingly important to U.S. producers during 1978-82, rising as a share of U.S. producers' total shipments (domestic and export), from 24 percent in 1978 to nearly 41 percent in 1980, before declining to approximately 32 percent in 1981 and 1982. This recent decline reflects the stagnant condition of the U.S. market for heavy electrical equipment and increased offshore equipment purchases (particularly by natural-resource-rich developing countries).

Selected country exports

To date, exports of heavy electrical equipment from Brazil and Korea have been negligible.

Conditions of competition in international markets

As a result of the decline in electric power consumption in the industrialized nations of the world since 1973, there is currently significant underutilized worldwide production capacity in heavy electrical equipment. World producers, therefore, have increasingly looked to markets in the developing nations of the world in an attempt to sustain historical production levels. Many of these countries have considerable wealth from the sale of oil and other natural resources, and they have embarked on ambitious electrification and industrial development programs. Other countries have less financial liquidity but need to rapidly expand their production of power in order to continue their transition to an industrialized state. The markets for heavy electrical equipment in Brazil and Korea have been protected, wherever possible, by national procurement policies, technology transfers, and various assistance to indigenous producers. In Korea, the procurement of foreign heavy electrical equipment has evolved into a complicated, and often political, process.

U.S. heavy electrical equipment manufacturers have an outstanding worldwide reputation for producing equipment of high quality and efficiency. However, U.S. producers have indicated that these attributes have not been as important in securing equipment contracts in international markets as they have been in the domestic market. The price and financing of heavy electrical equipment purchases are apparently the key factors in securing offshore sales, according to U.S. competitors in these markets.

Footwear

Description and uses

The products covered in this section include all types of footwear made of both rubber 1/ and nonrubber materials. Nonrubber footwear accounted for about 90 percent of U.S. producers' shipments and U.S. imports in 1983. Nonrubber footwear includes dress, casual, and certain athletic footwear; work shoes; and sandals and slippers made of leather, vinyl, or, to a lesser extent, fabric, cork, and wood. In 1983, leather footwear represented about 55 percent of U.S. production and 46 percent of U.S. imports of nonrubber footwear; vinyl footwear accounted for 23 percent and 20 percent, respectively.

Rubber footwear 2/ may be divided into two distinct product categories: (1) protective footwear, such as galoshes, overshoes, and firemen's boots, designed for protection against water, oil, and grease, and (2) footwear with fabric uppers and soles of rubber or plastics, such as sneakers, certain joggers, other athletic shoes, slippers, and casual shoes (hereinafter fabric-upper footwear). In 1983, fabric-upper footwear accounted for approximately 90 percent of U.S. production and 80 percent of U.S. imports of rubber footwear.

A third category is zoris, which are plastic thonged sandals intended primarily for beach or shower wear. Such footwear is not made in the United States.

The basic production process for most footwear comprises cutting, fitting, lasting, bottoming, finishing, packing, and warehousing. Many types of rubber footwear are constructed by molding processes.

U.S. industry profile

Distribution of domestically produced footwear consists of producers selling directly through their own sales force to retailers and, to a lesser extent, selling through their own retail outlets or jobbers. Imported footwear is sold by foreign manufacturers directly to U.S. retailers, or to importers, including U.S. producers, which sell directly or through jobbers to U.S. retailers. To an increasing degree, U.S. retailers and producers import directly. More than 80 percent of domestically produced and imported footwear is sold directly to retail outlets. Footwear is retailed in a variety of outlets, including independent shoe stores, department stores, chain stores, self-service stores, and, to a lesser extent, mail-order houses and supermarkets.

1/ The term "rubber" is used in the footwear trade to include synthetic rubber, such as thermoplastic rubber.

2/ For import purposes, rubber footwear is defined as footwear that is more than 50 percent by weight of rubber or plastics or more than 50 percent by weight of fibers and rubber or plastics, with at least 10 percent by weight being rubber or plastics.

Nonrubber footwear.--Nonrubber footwear was produced domestically in 1982 by 248 firms, down from 307 in 1979. Although the U.S. nonrubber footwear industry includes approximately 50 publicly owned corporations, it comprises many more privately owned firms, most of which are small. Approximately 70 percent of the producers make less than 1 million pairs annually and account for less than one-fifth of total domestic production. By contrast, the 20 largest producers, each with multifactory operations and annual production levels of 4 million pairs or more, together accounted for about one-half of the industry's production.

The nonrubber footwear industry has declined significantly in size over the years, decreasing from a high of 990 factories in 1965 to slightly less than 600 in 1982. Production of footwear has declined rapidly in Massachusetts, Pennsylvania, and New York, whereas California, Texas, and Florida have increased their output and are emerging as significant footwear-producing States.

Total employment in the nonrubber footwear industry declined 9 percent from 1981 to 1983, falling to 132,700 employees. The unemployment rate was 18.7 percent in 1983; 19.4 percent in 1982; 12.5 percent in 1981.

To the extent that any loss of domestic and/or international market share results from targeting practices, the corresponding absence of each \$1 million in production not undertaken by U.S. nonrubber footwear manufacturers would translate into an estimated 46 workers displaced in all sectors of the U.S. economy (on the basis of 1982 production/employment relationships), according to the staff of the U.S. International Trade Commission, using the BLS input-output model, as seen in the following tabulation:

Industry sector	Employment
	<u>Number</u>
Nonrubber footwear-----	28
Other manufacturing-----	10
All other-----	8
Total-----	46

Rubber footwear.--About 212 million pairs of rubber footwear were sold in the United States in 1983. Of this total, about 90 percent were fabric-upper footwear, primarily joggers, sneakers, and casual footwear; the remainder were protective footwear and zoris.

The contraction of the industry that started in the 1960's continued during the 1980's, with the number of establishments declining from approximately 67 in 1979 to an estimated 50 in 1982. In 1982, approximately 40 of the establishments produced fabric-upper footwear, which accounted for approximately 90 percent of total domestic output of rubber footwear, and the remaining establishments, protective footwear. That segment of the industry producing fabric-upper footwear is dominated by firms making highly advertised brand-name joggers and other athletic footwear, with over half the output of fabric-upper footwear coming from six producers. Approximately seven firms manufactured protective footwear in 1982.

The total number of employees in the rubber footwear industry declined annually from 20,400 in 1981 to 18,200 in 1983, or by 11 percent.

To the extent that any loss of domestic and/or international market share results from targeting practices, the corresponding absence of each \$1 million in production not undertaken by U.S. rubber footwear manufacturers would translate into an estimated 34 workers displaced in all sectors of the U.S. economy (on the basis of 1982 production/employment relationships), according to the staff of the U.S. International Trade Commission, using the BLS input-output model, as seen in the following tabulation:

Industry sector	Employment
	<u>Number</u>
Rubber footwear <u>1/</u> -----	16
Other manufacturing-----	9
All other-----	9
Total-----	34

1/ This figure also includes workers who manufacture miscellaneous rubber products, such as hoses, belts, toys, tiles, and gloves.

Foreign industry profile

Brazil. 1/--The Brazilian footwear industry, although faced with continued recession and high inflation, showed signs of good health in 1983 with a steady cash flow, some investment, extremely low unemployment, and increasing exports. Many nonexporting firms, however, faced a declining domestic market and continued high interest rates. Moreover, they have to compete with the exporting firms to acquire raw materials. Most firms that do not manufacture for export have switched from producing leather shoes to plastic shoes, since the domestic market for synthetic shoes has increased substantially as the consumers' purchasing power has declined.

In 1983, Brazil's footwear industry comprised roughly 4,000 firms. Of these, nearly 3,900 were small- or medium-sized firms, employing less than 100 people and accounting for 47 percent of industry sales. Approximately 200 firms were exporters of footwear. A little more than 80 percent of the shoe manufacturers are located in the southern region of Brazil (States of Sao Paulo, Parana, Santa Catarina, and Rio Grande do Sul). Brazil's footwear workers, as with footwear workers worldwide, are regarded as semiskilled or unskilled.

1/ This section is based mainly on information from the U.S. Embassy, Porto Alegre, U.S.I.T.C. Section 201 Investigation of Nonrubber Footwear: Request for Information, April 1984.

The Brazilian industry's annual output capacity was 550 million pairs of shoes in 1983. Capacity utilization was estimated at 82 percent. Most of Brazil's production is consumed internally. Leather is the principal raw material used in footwear production in Brazil, although its relative importance has been declining. Total production of all types of footwear in 1979 was 324 million pairs, of which just over 60 percent consisted of leather footwear. In 1983, total production was estimated at 450 million pairs, of which 53 percent were made of leather, the bulk consisting of women's fashion shoes. Nevertheless, leather footwear production has increased since 1979 as shown in the following tabulation (in millions of pairs):

<u>Year</u>	<u>Total footwear</u>	<u>Nonrubber footwear</u>	<u>Leather footwear</u>	<u>All other footwear</u>
1979	323.7	1/	199.3	1/
1980	371.4	239.1	214.0	132.3
1981	399.2	244.7	235.0	154.5
1982	425.0	252.0	238.1	173.0
1983	450.0	265.5	238.1	184.5

1/ Not available.

Korea. 1/--In 1983, total production amounted to 309 million pairs of shoes, of which 61 percent were athletic footwear. Korea's production of footwear, by types, are shown in the following tabulation (in millions of pairs):

<u>Year</u>	<u>Total footwear</u>	<u>Athletic footwear</u>	<u>Rubber footwear</u>	<u>Leather footwear</u>	<u>All other footwear</u>
1979	288.3	144.7	54.1	21.3	68.2
1980	265.5	153.8	36.4	21.3	54.0
1981	279.1	174.9	29.2	18.9	56.1
1982	295.9	181.8	27.3	28.6	58.2
1983	309.5	189.5	22.0	30.7	67.3

Korea's annual capacity for the production of footwear remained near 70 million pairs until 1970. In 1975, however, it reached 150 million pairs, representing a rise of more than 110 percent in just 5 years. This was primarily the result of expansion projects initiated by local firms to meet the rising export demand. In 1979, Korea's annual capacity reached 327 million pairs and its utilization of capacity reached 86 percent. Although Korea's production capacity declined to 296 million pairs in 1980, it has been increasing gradually since then. In 1983, production capacity reached a record 366 million pairs, and utilization of capacity reached 85 percent.

Korea's footwear industry is almost entirely export oriented. Shoes for the Korean market come mostly from small scale manufacturers as opposed to the larger firms, which concentrate on exporting. In the domestic market, the

1/ This section is based primarily on information received from the U.S. Department of State's "Industrial Outlook Report," from Seoul, Korea, June 14, 1983, and from U.S. Embassy, Seoul, U.S.I.T.C. Section 201 Investigation of Nonrubber Footwear: Request for Information, April 1984.

consumer trend is toward high-quality athletic footwear and away from traditional dress shoes. A factor contributing to this growing demand for athletic shoes was the lifting of uniform dress codes in 1981 for middle and high school students. Prior to 1981, athletic shoes were not allowed to be sold in Korea. In addition, Korea is experiencing a sports boom, reflecting the widespread interest in the 1986 Asian Games and the 1988 Olympics in Seoul.

In 1983 there were a total of 105 Korean footwear manufacturers, 96 of which produced nonrubber footwear. While more than half of the manufacturers employed less than 500 workers, the Korean industry is considerably more concentrated than that of the United States, Brazil, or Taiwan. After the United States ended the Orderly Marketing Agreements (OMA's) ^{1/} in June 1981, there was a rapid increase in medium-sized manufacturers anticipating greater increases in export demand. Approximately 10 new factories were established in 1982, but to avoid unnecessary price competition among Korean manufacturers and exporters, the government initiated a voluntary-restraint system, allocating export levels on the basis of exporters' previous export performance. Korean industry sources reported that 14 small companies went bankrupt in 1983 because of stiff competition from larger companies.

The footwear industry, employing about 109,000 persons in 1982, accounted for about 4 percent of the total Korean labor force in the manufacturing sector. The labor productivity index for the footwear industry has increased annually since at least 1976, rising from 62.3 that year to 193.7 (1980=100) in the first half of 1983. Korea's footwear workers are considered semiskilled or unskilled, producing a quality of footwear that is consistent and good.

Taiwan. ^{2/}--Footwear production in Taiwan was estimated at 554 million pairs in 1983, representing a 29-percent increase over production in 1981, and an increase of 48 percent since 1979 as shown in the following tabulation (in millions of pairs):

Year	Total footwear	Athletic footwear	All other footwear
1979-----	375.7	84.0	291.7
1980-----	446.2	99.8	346.4
1981-----	430.8	85.5	345.3
1982-----	462.3	105.3	357.0
1983-----	554.5	135.5	419.0

^{1/} Imports of nonrubber footwear from Korea and Taiwan were quantitatively controlled under the OMA's for 4 years from June 28, 1977, to June 30, 1981.

^{2/} This section is based mainly on "Industrial Outlook Report: Shoes and Leather Products" from the American Institute in Taipei, April 1983, and a report from the American Institute in Taipei, U.S.I.T.C. Section 201 Investigation of Nonrubber Footwear: Request for Information, May 1984.

Plastic footwear, the production of which is characterized by unskilled labor and relatively simple, inexpensive technology, accounts for approximately 80 percent of Taiwan's total footwear production. However, footwear manufacturers in Taiwan have been making an effort to shift production from plastic footwear to higher value-added leather footwear requiring more sophisticated technology and skilled labor. The transition to leather and more expensive plastic footwear has been encouraged by the government in Taiwan, which has offered duty rebates for machinery imports that should help bring about the industry's development and lower interest rates on bank loans needed for expansion. However, manufacturers have found the upgrading to more expensive footwear difficult, because of a shortage of investment capital and the rising costs of machinery and labor.

Like that in Korea, Taiwan's footwear industry is almost entirely export oriented, with only 3 percent of production retained for the domestic market. The footwear industry is Taiwan's third largest employer after textiles and apparel and electronics, employing about 9 percent of all manufacturing employees. In 1982, approximately 120,000 employees were engaged in footwear production. Rubber and plastic shoe production is the largest segment of Taiwan's footwear industry, employing three-fourths of the total number employees.

In 1980 approximately 500 shoe producers were registered with the Footwear Manufacturers' Association of Taiwan. More than 200 new factories opened when the OMA with the United States expired in June 1981. In 1983, there were 933 footwear producers in Taiwan, two-thirds of which were small-scale, family-owned manufacturers with low capital and with exports of less than \$1.0 million annually. In 1981, only eight firms had export shipments of \$10 million or more. Total invested capital for all firms was estimated at \$150 million. The majority of the firms were concentrated in central Taiwan (Taichung city and county).

Taiwan's footwear industry is practically a self-sufficient industry in that most of its inputs are locally produced. Plastics needed for the footwear industry are produced in one of the largest plastics works in the world at Kaoshiung. Composition leather, or "false leather," is an exclusive product developed within the industry in Taiwan and material for fabric-upper footwear is produced by its domestic textile industry. Footwear machinery is now produced in greater amounts by its domestic machinery industry than are imported, with only about 20 percent of Taiwan's footwear machinery coming from overseas.

One of the major problems faced by the industry in recent years has been a shortage of labor, which prevented some plants from reaching full capacity. Although there has been some machinery and equipment modernization, the industry is still highly labor intensive. During 1979-81, capacity utilization remained stable at 77 percent, increasing to 81 percent in the United States in 1983.

U.S. market

An estimated 916 million pairs of nonrubber footwear were sold in the United States in 1983, and approximately 64 percent of that, or 582 million pairs, were imported.

The U.S. market is characterized by a large number of segments that combine various factors, including age and gender (men's, women's and children's footwear), intended use of the footwear, types of retail outlets, prices, and, to a lesser degree, materials and construction methods used.

Long-term demand for footwear is believed to depend primarily on the size and composition of the population. However, nonrubber footwear consumption between 1964 and 1982 moved erratically in the 700-825 million range, while the population showed a steady increase of about 1 percent a year, rising from 191 million to 232 million persons. Consumption in 1983 reached 916 million pairs, which will be exceeded in 1984; this may indicate the entry into an era of significantly increased footwear consumption.

Short-term demand for shoes may vary with changes in price, income, fashion, and life style. The total quantity of footwear purchased, however, generally does not change significantly as a result of changes in its relative price (vis-a-vis the prices of other goods) or changes in income. Frequent changes in women's footwear fashion contribute to a greater demand for women's footwear; style changes are less important for men's footwear. In the last decade changes in life styles to more athletic and increased leisure activities have stimulated demand for athletic shoes. In recent years, women's shoes accounted for approximately 50 percent of the U.S. footwear market, followed by men's shoes and athletic shoes, which accounted for about 25 percent and 12 percent, respectively, of the total market share.

In 1982, \$8.5 billion were spent on footwear in the United States. In terms of volume, overall demand for footwear has been relatively stable with the largest increase in consumption occurring in recent years. In 1982, U.S. consumption of footwear amounted to approximately 1.0 billion pairs, a 9-percent increase since 1980. In terms of value, however, apparent U.S. consumption increased more than 200 percent in the past 20 years (table B-1). The increased value of U.S. shipments was primarily due to inflation; real growth occurred as total imports grew from approximately \$125 million in 1963 to \$3.4 billion in 1982. Imports from Taiwan and Korea accounted for the major part of this growth, and by 1982 these two countries together supplied 21 percent of the total value of U.S. footwear consumption. U.S. imports of Brazilian footwear began to grow during the mid-1970's, and by 1982, Brazil had become the fourth largest supplier, accounting for 4 percent of the total value of apparent U.S. consumption. Taiwan and Korea supply the U.S. market mostly with low- to medium-priced footwear made of synthetic materials. Korea is a major source for athletic footwear Brazil principally supplies moderately priced women's leather fashion shoes.

U.S. shipments

During the past 20 years, U.S. producers' shipments of footwear ranged from a low of \$2.7 billion in 1963 to a high of \$5.4 billion in 1981 (table B-63). They amounted to \$5.2 billion in 1982, a 5-percent drop from the 1981 record high. Although the 1981 and 1982 shipment levels were approximately twice the amount of the 1963 level, most of this increase reflected inflation rather than real growth. Moreover, in terms of volume, domestic shipments in 1982 were approximately 25 percent below the 1963 level. The decline in the volume of U.S. shipments, in large part, reflected the rise in imported footwear, which continuously captured a larger share of the U.S. market. From 1979-82, U.S. shipments of footwear continued a downward trend, falling from 510 million pairs to 446 million pairs, or by 13 percent.

U.S. imports

About 400 firms, including wholesalers, retailers, and domestic footwear producers, imported footwear in 1983. Approximately 100 of these importers, including about 20 U.S. manufacturers of nonrubber footwear, together accounted for a little over 50 percent of total U.S. imports in 1983.

Prior to the 1960's imports of footwear were very small. In 1963, U.S. imports of footwear amounted to \$129.3 million, increased to \$915.0 million in 1972, to \$3.1 billion in 1979, and to \$3.7 billion in 1982 (table 97). Over the same period of time, the quantity of footwear imported into the United States grew from 91.5 million pairs to 715.0 million pairs, or by almost 700 percent (table 98). The imports share of the footwear market, in terms of value, grew from 4 percent in 1963 to 40 percent in 1982. 1/

The major foreign sources of footwear are Taiwan, Korea, Italy, Brazil, and Spain. In recent years imports reached record levels, with most of the growth being generated by Taiwan, Korea, and Brazil. In 1982, these three countries together accounted for approximately 60 percent of the total volume and value of U.S. imports.

Taiwan became the dominant U.S. source for imported footwear as imports from Taiwan grew from 13.8 million pairs, valued at \$7.7 million, in 1967 to 223.7 million pairs, valued at \$1.0 billion, in 1982 (tables 97 and 98). In terms of value, Taiwan accounted for a little over 27 percent of total imports in 1981 and 1982. In fact, since 1972 Taiwan has accounted for approximately 30 percent of the total volume of imported footwear. U.S. imports of footwear from Taiwan showed significant growth after the termination in mid-1981 of the orderly marketing agreement. 2/ From 1981 to 1982, the quantity and value of imported footwear from Taiwan increased 20 percent and 13 percent, respectively. 3/

1/ On the basis of official statistics of the U.S. Department of Commerce, the imports share of the market volume in 1983 reached a record 67 percent; in terms of value, imported footwear captured 46 percent of the market.

2/ From June 28, 1977, to June 30, 1981, nonrubber (primarily leather and vinyl) footwear imported into the United States from Taiwan and Korea was quantitatively controlled under orderly marketing agreements (OMA's).

3/ From 1981 to 1983 the quantity and value of imported footwear from Taiwan increased 54 percent and 36 percent, respectively.

Table 97 Footwear: U.S. imports, total and from major suppliers, specified years 1963 to 1982

Year	U.S. imports			Ratio of—		
	Total	From Brazil	From Korea	From Taiwan	Import from Brazil to total imports	Imports from Korea to total imports
					Percent	Percent
1963	129,270	145	746	289	1/	1/
1967	263,220	269	7,022	7,673	1/	2.7
1972	915,015	42,341	43,604	98,708	4.6	4.8
1979	3,069,997	257,557	405,216	657,857	8.4	13.2
1981	3,214,554	394,309	573,027	883,808	12.3	17.8
1982	3,671,078	379,291	795,273	994,301	10.3	21.7
1/ Less than 0.05 percent.						

Source: Compiled from official statistics of the United Nations, except as noted.

Table 98.—Footwear: U.S. imports, total and from major suppliers, specified years 1963 to 1982

Year	U.S. imports				Ratio of—			
	Total	From	From	From	Import from	Imports from	Imports from	Total imports
		Brazil	Korea	Taiwan	Brazil to	Korea to	Taiwan to	
		1,000 pairs			total imports	total imports	total imports	
								Percent
1963	91,496	1/	842	700	1/	1/		1.0
1967	173,796	1/	2,735	13,855	1/	1.6		8.0
1972	332,100	11,809	8,021	98,791		3.6	2.4	29.7
1979	626,966	32,315	76,187	192,316		5.2	12.2	30.7
1981	645,331	43,091	95,898	186,259		6.7	14.9	28.9
1982	715,033	41,311	132,508	223,695		5.8	18.5	31.3
1/ Less than 0.05 percent.								

Source: Compiled from official statistics of the U.S. Department of Commerce.

Imported footwear from Korea, following a trend similar to imports from Taiwan, increased rapidly between 1967 and 1982. During the period, U.S. imports from Korea increased from 2.7 million pairs, valued at \$7.0 million, to 132.5 million pairs, valued at \$795.3 million (tables 97 and 98). Shipments from Korea also showed substantial growth after the OMA was lifted in June 1981, as the volume, as well as the value, of imports increased in 1982 by almost 40 percent. ^{1/} In the past decade, Korea was the second largest volume supplier of imported footwear, and in 1982 it accounted for almost 19 percent of the total volume. In 1982, the value of Korean imports accounted for 22 percent of the total value of imported footwear.

U.S. imports from Brazil, which were negligible until the early 1970's, increased from 11.8 million pairs, valued at \$42.3 million, in 1972 to 41.3 million pairs, valued at \$379.3 million, in 1982 (tables 97 and 98). ^{2/} In 1982, Brazilian footwear made up 6 percent of the total volume and 10 percent of the total value of U.S. footwear imports.

Conditions of competition in the U.S. market

Imports of footwear from Brazil, Korea, and Taiwan have consistently increased as a share of total U.S. consumption. Their market share rose from 3 percent in 1972 to 24 percent in 1982 (table 97). ^{3/}

Competition in the U.S. market between imported and domestic footwear is strong, with Brazil, Korea, and Taiwan enjoying a price advantage because of their lower labor costs. However, this wage advantage is partially offset by domestic manufacturers having the advantage of shorter delivery time and offering better servicing.

Virtually all of Brazil's footwear shipments to the United States in recent years consisted of leather shoes, with those of women's fashion shoes accounting for the overwhelming share. Women's leather shoes from Brazil averaged \$8 per pair (Customs value) in 1982, compared with slightly more than \$12 per pair for those from Italy and Spain, which are also major U.S. suppliers of fashion leather footwear. In 1982, U.S. producers' shipments of women's leather footwear averaged \$17.47 per pair. Low labor costs and volume production enable Brazil to compete in the United States. Brazil has increased its competitiveness by capitalizing on its fashion image branded footwear.

^{1/} Korean imports in 1983 continued to show substantial growth, as the volume increased by almost 70 percent over the 1981 level and the value rose by 50 percent.

^{2/} Brazil emerged as the third largest foreign supplier of footwear, in terms of volume, in 1983 and accounted for almost 8 percent of total imports. The quantity of imports from Brazil in 1983 was 57 percent above the 1982 level and 100 percent above the 1979 level.

^{3/} In 1983, the value of imports from Brazil, Korea, and Taiwan captured 30 percent of the U.S. market.

The U.S. market for branded athletic footwear, in which Korean shoes play an important role, is extremely competitive at the retail level. In 1982 the average unit value of athletic footwear from Korea was \$6.52 per pair; the average unit value for U.S. producers' shipments of nonrubber athletic footwear was \$13.15 per pair.

Imported products from Taiwan are composed principally of shoes made of synthetic materials destined for the low- to medium- price mass market in the United States. In 1982, the average unit value per pair of imported footwear from Taiwan was \$4.39; similar footwear produced in the United States averaged approximately \$8.35 per pair. The lower priced synthetic footwear imported from Taiwan has enabled Taiwan to capture a large share of the U.S. market for inexpensive footwear.

International markets

The largest markets for footwear are the developed countries, such as the United States, the European Economic Community, Japan, and Canada. The principal foreign suppliers of footwear to these countries are in the Orient and Italy. The competitive situation in Europe, Japan, and Canada resembles the situation in the U.S. market. The Orient, principally Taiwan and Korea, supply a large part of the low-priced footwear, while most of the higher priced footwear is manufactured domestically or imported from other countries. Italy, Spain, and France are particularly competitive in this higher priced footwear line.

World production of footwear totaled approximately 8 billion pairs in 1981. Asia produced approximately 40 percent of the world total in 1981, followed by Eastern Europe and Western Europe, which accounted for 20 percent and 15 percent, respectively. North and Central Americas accounted for 10 percent of the output.

The Soviet Union was the leader in world production in 1981, producing 956 million pairs. Taiwan and Italy were the leading export countries, exporting 399 million pairs and 338 million pairs, respectively. The United States was by far the leading importer of footwear, as shown in the following tabulation on leading footwear traders (in millions of pairs):

<u>Production</u>	<u>Exporters</u>	<u>Importers</u>
Soviet Union--- 956	Taiwan----- 399	United States---- 516
China----- 895 <u>1/</u>	Italy----- 338	West Germany----- 190
Japan----- 485 <u>1/</u>	Korea----- 202 <u>1/</u>	United Kingdom---- 129
United States-- 464	Hong Kong----- 133	France----- 125
Italy----- 445	China----- 97 <u>1/</u>	Soviet Union----- 121
Taiwan----- 430	Spain----- 71	Japan----- 69
Brazil----- 422	Czechoslovakia-- 59 <u>1/</u>	Hong Kong----- 63 <u>2/</u>
India----- 346 <u>1/</u>	France----- 56	Canada----- 57
Korea----- 279	Brazil----- 49	Netherlands----- 52
Mexico----- 215 <u>1/</u>	Poland----- 33 <u>1/</u>	Belgium----- 44

1/ Estimated.

2/ Mainly for re-exports.

Source: World Footwear Industries Statistical Review, February 1983, Shoe and Allied Trade Research Association (SATRA).

U.S. exports

U.S. footwear exports have traditionally been small, averaging about 3 percent, or less, of the total volume and value of domestic shipments annually. In terms of value, however, footwear exports increased annually from \$41.6 million in 1977 to a record \$140.6 million in 1981, before declining to \$119.6 million, in 1982 (table B-26).

The relatively small amount of U.S. exports is attributed primarily to international competition, foreign trade barriers, and marketing and transportation costs. The strength of the U.S. dollar and sluggish demand in Europe also adversely affected U.S. exports in 1982.

In recent years U.S. footwear exports consisted mostly of men's athletic and casual shoes and western boots. Japan was the largest single market in 1982, accounting for 18 percent of the value of total exports followed by Canada and Italy, which accounted for 11 percent and 7 percent, respectively. Europe accounted for 15 percent of the total in 1982.

Selected country exports

Brazil.--Brazil did not emerge as a major exporter of footwear until the early 1970's. In 1972, Brazilian exports of footwear amounted to \$54.6 million, increased to \$174.5 million in 1977, and further increased to \$501.0 million in 1982 (table B-27). 1/ The United States is, by far, Brazil's largest export market for footwear, accounting for 75 percent of total exports in 1982, 2/ followed by the United Kingdom and Canada, which together accounted for 12 percent of the total. Leather footwear, primarily for women, accounted for nearly all of Brazil's footwear exports. The growing importance of the United States as a Brazilian export market is primarily the result of reduced price competitiveness of Brazilian shoes in other world markets. Since export prices for Brazilian footwear are quoted in dollars, they have become much more expensive as the dollar has appreciated. Thus, Brazil's efforts to diversify its export markets have been hindered by the present economic conditions.

Korea.--In 1967, Korean exports of footwear totaled about \$8 million, of which the U.S. market accounted for 90 percent. Korean exports of footwear have grown rapidly since then, increasing from \$55 million in 1972 to \$488 million in 1977, and to \$1 billion in 1981 (table B-28). The United States, the major market for Korean shoes, accounted for 62 percent (\$302.2 million) of the total Korean footwear exports in 1977 and 55 percent (\$561.6 million) in 1981. 3/ Other important markets included Japan, the United Kingdom, and

1/ In 1983, Brazil became the world's fourth largest exporter of shoes.

2/ In 1983, the United States accounted for approximately 80 percent of Brazil's total exports of footwear.

3/ Korean exports of nonrubber footwear to the United States were quantitatively controlled under an OMA for 4 years (from June 28, 1977, to June 30, 1981). Korea's exports to the United States increased sharply in 1982 and 1983. The volume of exports to the U.S. market increased almost 60 percent between 1981 and 1983, while the export volume to Japan dropped 33 percent and exports to the United Kingdom and Canada declined by 25 and 12 percent, respectively.

Canada. In 1981, exports to Japan total \$99 million, or 10 percent of Korea's total footwear exports. The United Kingdom and Canada together made up 10 percent of the total in 1981.

After the establishment of the OMA with the United States in June 1977, Korean footwear manufacturers, which are almost entirely export oriented, went through a difficult 2-year period, suffering from excessive inventory build up primarily because of their limited access to the U.S. market. However, by 1979, Korea had developed about 15 new markets, including Sudan, Cameroon, and Ireland. Additionally, existing markets in Japan, the United Kingdom, and France doubled their purchase volume during 1977-79. By 1980, however, this trend of expanding markets had slowed and the majority of exports were once again being shipped to the United States.

Athletic footwear is the principal Korean footwear export. Other leading items include rubber boots, slippers and casual shoes made of plastics. The average unit value of Korea's footwear exports has increased in recent years. This is attributed to the upgrading in quality in order to produce more attractive shoes that appeal to fashion-conscious consumers in developed countries.

Taiwan.--As with other major world suppliers of footwear, Taiwan did not export footwear to any extent until the early 1970's. In 1972, exports of Taiwanese footwear totaled \$154.3 million, increased to \$616.2 million in 1977, and further increased to \$1.4 billion in 1980 (table B-29). The United States has traditionally been the major market, accounting for 60 percent or more of Taiwan's footwear exports. In 1980, footwear shipments to the U.S. market were \$822.4 million. ^{1/} West Germany, the next largest market, received shipments in 1980 valued at \$110.9 million, representing 8 percent of the total. Exports to Japan and Australia together, accounted for another 8 percent in 1980.

Partly in response to the OMA with the United States, Taiwan had some success in diversifying its markets during 1977-81, and opening up markets in Japan and a few Middle Eastern countries.

Plastic footwear accounted for the bulk of Taiwan's footwear exports and more than 60 percent of such exports consisted of sandals, slippers, and sports shoes. There has been a trend toward higher quality shoes, especially higher priced women's plastic sandals, boots, and casual shoes. The trend to export higher quality shoes has led to more production of leather footwear. In 1980, leather shoes, the fastest growing category, accounted for approximately 10 percent of the total value of Taiwanese footwear exports.

^{1/} Taiwan's exports of nonrubber footwear to the United States were quantitatively controlled under an OMA for 4 years (from June 28, 1977 to June 30, 1981). After the expiration of the OMA, Taiwan's exports to the U.S. market increased substantially. In terms of volume, exports from Taiwan to the United States in 1983 showed a 48-percent increase over the 1981 level and a 56-percent increase over the 1979 level.

Conditions of competition in international markets

The major factor of competition in the international footwear market is price. Other important conditions include fashion and quality, labor costs, and government policies.

Shoemaking is labor intensive and comprises essentially a piecework, cut-and-assembly operation. Footwear production processes are similar throughout the world. However, the production process in some of the developing countries with lower wage rates tends to be more labor intensive. The U.S. industry tends to rely on labor-saving equipment, such as molding machines and computer-controlled stitching equipment, to reduce labor costs and is generally more capital intensive.

The average hourly earnings of nonrubber footwear production workers in the United States were only \$5.27 in 1983 compared with \$8.66 for all manufacturing; nevertheless, they were considerably higher than the hourly rates of approximately \$1.50 or less found in the principal foreign suppliers (i.e., Taiwan, Korea, and Brazil). This disparity is significant because labor costs, as a share of U.S. producers' average selling price, was 24 percent in 1983.

Average hourly earnings for production workers in the U.S. rubber footwear industry increased from \$5.06 in 1981 to \$ 5.73 in 1983, or by 13 percent. As in nonrubber footwear, the major Asian suppliers enjoy a price advantage because of their significantly lower labor costs. According to industry sources, wage rates are a critical factor in rubber footwear production, because direct labor typically accounts for 40 to 50 percent of the producers' total cost.

Hourly compensation costs for workers in Brazil's footwear industry have been increasing rapidly in recent years because of inflation. Despite a huge increase in the hourly compensation, from 30 cruzeiro in 1979 to an estimated 620 cruzeiro in 1983, Brazilian labor costs, when converted into U.S. dollars, still amounted to only 21 percent of U.S. labor costs in 1979 and 16 percent in 1983. When converted to U.S. currency, the hourly compensation of footwear workers in Brazil fell from an estimated \$1.57 in 1982 to \$1.07 in 1983.

The average hourly compensation for workers producing footwear in Korea was estimated at approximately \$1.00 per hour in 1983. This included not only hourly wages, but fringe benefits, such as annual bonuses, subsidized daily meals, dormitory space for single workers, and health benefits. Ten years ago, the hourly compensation of footwear workers was only about 21 to 22 cents. However, the wages in the Korean footwear industry increased rapidly during the 1970's and 1980's. Despite these rapid increases, the hourly compensation of footwear workers in Korea (in U.S. dollars) declined as a share of the U.S. hourly compensation between 1979 and 1983, from 17 to 15 percent.

Labor costs in Taiwan's footwear industry have increased rapidly in recent years but still represented only 21 percent of U.S. compensation in 1983. Between 1979 and 1983, hourly compensation of footwear workers in Taiwan increased from 87 cents to an estimated \$1.46, or by 68 percent, representing an average annual growth of 14 percent. In Taiwan currency, wages increased 87 percent between 1979 and 1983.

Tremendous competitive pressure has been created in the world footwear market in the past decade as a result of increased production and capacity in numerous developing and developed countries. However, because footwear production is labor intensive and requires relatively little capital investment or technical expertise, world shoe production has been shifting from the developed countries to the developing countries, where labor is abundant and wages are low. The ease of entry into footwear production makes it a primary target for the industrializing or newly industrialized countries.

Among the countries under study, Taiwan, Korea, and Brazil have the advantages of labor costs and government support in trade policies. Taiwan and Korea, in particular, have developed well-established distribution systems and long-established market links in almost all major international markets, while Brazil has become a very important source for competitively priced fashionable leather footwear. In addition, Taiwan, Korea, and Brazil have developed reputations as reliable suppliers of satisfactory products. In contrast the U.S. footwear industry does not compete on a large scale in international markets.

Prohibitive tariff rates in Taiwan, Korea, and Brazil, as well as in other countries, make it difficult for high-cost producers such as the United States to compete effectively in those markets.

Machine Tools

Description and uses

Metalworking machine tools are machines used for shaping or surface-working metals. These machine tools are generally classified as one of two types--metal-removing or metal-cutting, and metal-forming. Metal-removing machine tools are those that "shape or surface-work metal by removing metal either in the form of chips, dust, swarf, or similar forms or by spark-erosion, ultrasonic, electrolytic, or other chipless methods." ^{1/} Examples of such tools include machines for boring, drilling, gear cutting and finishing, grinding (special-purpose, surface, and tool and cutter grinding), polishing, lapping, honing, milling, planing, shaping, slotting, broaching, sawing, filing, turning, threading, and for multiple functions (machining centers). In contrast, metal-forming machine tools are "metal-working machine tools other than metal-removing (metal-cutting) machine tools." ^{2/} Examples of metal-forming machine tools include machines for punching, pressing, shearing, bending, forging, forming, and other special tasks.

U.S. industry profile

Major U.S. consumers of machine tools are manufacturers of transportation equipment--especially the automobile and aircraft industries. U.S. automobile and aircraft manufacturers, and their suppliers, account for approximately 40 percent of the U.S. market for metalworking machine tools. Other important customers include manufacturers of fabricated metal products, nonelectrical machinery, and electronic or electrical machinery.

Products are sold predominantly through distributors or directly to end users, although a limited number of manufacturers sell their products through agents or by other means. Major purchasers of machine tools tend to buy directly from the producer because of the sophisticated nature of the machine tools and the close working relationship that must be maintained between buyer and seller. Small job shops and other purchasers of metalworking machine tools generally buy from distributors because they are buying standard, "off-the-shelf," machine tools which do not require the engineering changes that typically necessitate a close association between buyer and manufacturer.

The U.S. metalworking machine tool industry has declined both in number of firms and in employment since 1977. In 1982, there were approximately 1,140 establishments producing metalworking machine tools in the United States, representing a 15-percent drop from the 1,343 establishments reported in 1977. In addition to the primary producers, there are a small number of establishments in other industries that manufacture machine tools as secondary

^{1/} As defined in the Tariff Schedules of the United States Annotated, 1983.

^{2/} Ibid.

products. During 1977-82, there were 64 mergers in the metalworking machine tool industry. The number of mergers increased through 1980, but declined in both 1981 and 1982. The following tabulation shows merger data obtained from the Federal Trade Commission and various editions of the Yearbook on Corporate Mergers, Joint Ventures, and Corporate Policy:

<u>Year</u>	<u>Number of mergers</u>
1977-----	8
1978-----	7
1979-----	10
1980-----	18
1981-----	10
1982-----	11
1983-----	4

Of the 68 mergers, 7 involved foreign firms taking over U.S.-owned firms; whereas 5 mergers involved a U.S.-owned firm acquiring a foreign firm. There is a consensus among manufacturers and purchasers of metalworking machine tools and industry analysts that mergers, acquisitions, and closings will accelerate in the 1980's. ^{1/}

The average U.S. metalworking machine tool establishment employs 77 people, of which 48 are production workers. The majority of U.S. establishments employ fewer than 20 people, and less than 1 percent of the establishments employ 1,000 or more people. As technological advances are applied to the manufacturing process, fewer skilled machinists will be required to run production equipment. For example, advances in numerical control have made it possible for one skilled machinist to run two or more machine tools where before one machinist was required for each machine tool. The application of new technology in the manufacturing process will probably continue to effect employment levels in the industry.

To the extent that any loss of domestic and/or international market share results from targeting practices, the corresponding absence of each \$1 million in production not undertaken by U.S. machine tool manufacturers would translate into an estimated 28 workers displaced in all sectors of the U.S. economy (based on 1982 production/employment relationships), as seen in the following tabulation:

<u>Industry sector</u>	<u>Displaced employment</u>	
	<u>Number</u>	
Machine tools-----	:	16
Other manufacturing-----	:	6
All other-----	:	6
Total-----	:	28

^{1/} According to Commission staff interviews with manufacturers and purchasers in Ohio, Illinois, and Michigan, and "Foreign Competition Stirs U.S. Toolmakers," Business Week, Sept. 1, 1980, pp. 68-70.

Foreign industry profiles

Korea.--By the end of 1982, there were approximately 70 firms in the Republic of Korea (Korea) manufacturing metalworking machine tools, employing about 15,000 factory workers. Korean machine tool production increased steadily during 1977-82, and by 1982, production totaled \$200 million. In 1977, Korean production of machine tools was valued at \$57 million. In 1979, production totaled \$163.7 million, representing a 72-percent increase over the previous year's production of \$95.0 million. 1/

According to the Korea Machine Tool Industry Association, more than 50 types of machine tools (including parts) are produced domestically. The types of metal-cutting machine tools produced include NC lathes, CNC lathes, machining centers, automatic deburring and tapping machines, grinding machines, horizontal boring and milling machines, shapers, auto cycle gear hobbing machines, and precision electrical discharge machines. The types of metal-forming machine tools produced include power and hydraulic presses, drop forging hammers, and a variety of shearing and bending machines such as press brakes and shearing machines, continuous shearing lines, and cold shearing and up-cut shearing machines. By the end of 1982, 23 firms were producing lathes, a major type of machine tool manufactures precision EDM's. 2/

In 1981, machine tools imported into Korea generally took the following distribution channels: sales offices of foreign companies, local "offering agents," Japanese trading companies, or Korean trading companies. 3/

Taiwan.--In 1981, there were 88 firms producing machine tools. 4/ Approximately 60 percent of Taiwan's machine tool builders are located in the Taichung province. 5/ Over 90 percent of Taiwan's machine tool producers are small-scale operations and manufacture limited precision conventional machine tools. However, the conventional machine tool industry of Taiwan has been losing international market share to major competitors from Hong Kong Singapore, the Peoples' Republic of China, and Korea. Taiwan Government officials would like to upgrade this industry, and move away from the increasing competition in the low-value-added end of the market. 6/

In 1982, machine tool production was valued at \$199.9 million, representing a 20-percent decrease compared with production in the previous year. 7/ During 1977-80, production increased dramatically, from \$58.3 million in 1977 to \$245.1 million in 1980. In terms of machine tool units, Taiwan's production totaled 181,701 in 1977, then rose to 556,571 in 1981. 8/

1/ U.S. Department of State Telegram, U.S. Embassy, Seoul, Korea, Mar. 11, 1983.

2/ Ibid.

3/ Stuart Brown, "Daewoo Pushes for Share of U.S. CNC Lathe Market," American Metal Market, Sept. 6, 1982, p. 10.

4/ U.S. Department of State Telegram, American Institute in Taiwan, Taipei, Taiwan, Mar. 17, 1983.

5/ Shoji Imai, "'Latent trends' In Taiwan's Machinery Industry," Metalworking Engineering & Marketing, November 1981, p. 81.

6/ U.S. Embassy report, CMP Industry Sector Analysis Form, Aug. 31, 1983.

7/ Figures for production, exports, imports, and consumption are from American Machinist, February issues, 1979-83.

8/ U.S. Department of State Telegram, American Institute in Taiwan, Taipei, Taiwan, Mar. 17, 1983.

In 1981, imported machine tools were sold through several distribution channels--"indenting agents," or sales representatives, accounted for about 55 percent of imported machine tool sales; distributors, for 25 percent; end users, purchasing directly from foreign manufacturers, about 15 percent; and the remaining 5 percent consist of sales to contractors. 1/ Engineers and contractors are occasional suppliers of machine tools, in that they are responsible for specifications and recommendations in the acquisition of machine tools for new plants in user industries. 2/

Employment in the industry increased from 5,693 workers in 1977 to 10,770 workers in 1982. In 1982, blue-collar workers constituted 85 percent of the industry's employment; white-collar workers, 15 percent. 3/

U.S. market

The United States is the largest single market for metalworking machine tools in the world. U.S. consumption increased from \$1.3 billion in 1963 to \$4.8 billion in 1978 and to \$6.0 billion in 1982 (table B-63, app. B). Major factors influencing the dramatic increase in metalworking machine tool consumption in the United States were the retooling of the U.S. automobile industry and the aircraft industry in the 1970's and demand for machine tools by producers of oil and gas equipment. The automobile and aerospace industries were developing new, fuel-efficient motor vehicles and aircraft, and the oilfield machinery industry was trying to satisfy increased worldwide demand for threaded oil well casings and related products.

U.S. shipments

U.S. shipments of metalworking machine tools (including parts) increased from \$1.5 billion in 1963 to \$2.8 billion in 1967, before decreasing to \$1.9 billion in 1972 (table B-63). Shipments increased until 1981, then decreased to \$5.5 billion in 1982.

As shown in figure 1, U.S. shipments of metalworking machine tools (reported in millions of 1982 dollars) peaked in 1967, 1975, and 1980 at \$5.6 billion, \$4.1 billion, and \$5.4 billion, respectively. Low points in shipments occurred in 1971 and 1976. In 1982, U.S. shipments were valued at \$3.7 billion. 4/

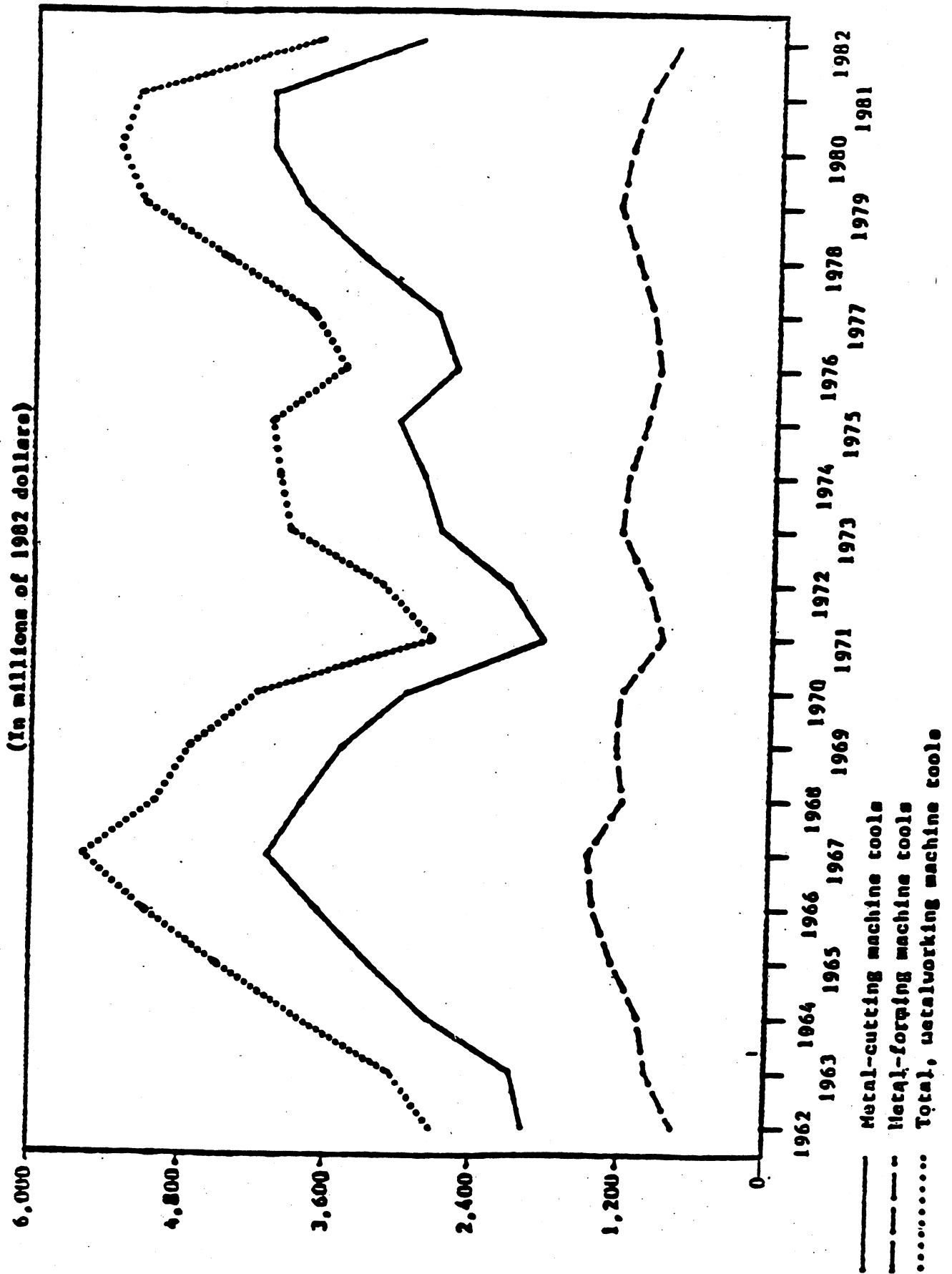
1/ Frost & Sullivan, Inc, Machine Tools & Accessories Market in Far East, New York, NY, March 1981, p. 161.

2/ Ibid.

3/ U.S. Department of State Telegram, American Institute in Taiwan, Taipei, Taiwan, Mar. 17, 1983.

4/ In 1983, U.S. shipments totaled \$4.2 billion, down 25 percent from that of 1982.

Figure 2. ---Metalworking machine tools: U.S. shipments, 1962-82.



Source: Current Industrial Report. Metalworking Machinery. U.S. Department of Commerce.

U.S. imports

U.S. imports of metalworking machine tools (including parts) increased sharply after 1972, rising annually from \$139.3 million in 1972 to \$1.7 billion in 1981, before dropping to \$1.5 billion in 1982 (table B-63). In 1982, principal supplying countries included Japan, accounting for 39 percent of total U.S. imports, West Germany (17 percent), the United Kingdom (9 percent), Canada (7 percent), and Taiwan and Switzerland (6 percent each).

U.S. imports of metalworking machine tools (including parts) from Korea and Taiwan increased significantly after 1972, rising annually from only \$0.3 million in 1972 to \$124.7 million in 1981, before declining slightly to \$119.9 million in 1982 (table B-63). Machine tool imports from Korea and Taiwan, as a percent of total U.S. machine tool imports, increased from less than 0.05 percent in 1967 to 8.1 percent in 1979, declined to 7.1 percent in 1980, then rose to 7.2 percent in 1981 and 8.0 percent in 1982.

U.S. imports of metalworking machine tools, as a percent of consumption, increased annually from 3.4 percent in 1963 to 24.8 percent in 1982. ^{1/} At the same time, U.S. imports from Korea and Taiwan, as a percent of consumption, increased less than 0.05 percent in 1967 to 2.0 percent in 1982.

Conditions of competition in the U.S. market

Four factors are important to a company's ability to compete effectively in the machine tool industry (1) labor cost (wages); (2) availability of capital; (3) technological knowhow and design ability; and (4) in the case of certain types of machines, low sales price. Wages paid to production workers in Korea and Taiwan are considerably lower than those paid to their counterparts in the United States. ^{2/} In 1982, production workers in the United States in major industry group SIC 35 (machinery, except electrical) were paid at an hourly rate of \$12.72, including fringes benefits, compared with \$1.58 per hour for Korean workers and \$1.59 per hour for Taiwan workers.

Because of the cyclical nature of the market, sources of financing are critical for survival. It has been difficult for the U.S. machine tool industry to generate capital. Since the profit of machine tool companies is generally only on par with that of other manufacturing industries during upswings and is much lower during downturns, and since the majority of U.S. companies are small and privately held, few domestic financial institutions will lend, given the risks involved. (The ratio of debt to equity in the U.S. industry is typically below 50 percent.) Therefore, profit earned in good years is generally held as a buffer for the downside of the cycle.

^{1/} In 1983, U.S. imports of metalworking machine tools, as a percent of consumption, amounted to 23.8 percent.

^{2/} U.S. Department of Labor, Bureau of Labor Statistics.

The emerging technologies of computer-aided design and computer-aided manufacture (CAD/CAM) are beginning to play an important role in the competitiveness of machine tool companies. Machine tool builders which now utilize CAD/CAM techniques in their own manufacturing operations are believed to be in a more favorable competitive position than those that do not. However, the diffusion of new technology in the U.S. machine tool industry has generally been slow. ^{1/} However, reason for this may be the difficulty in obtaining capital for U.S. machine tool builders, compared with some foreign machine tool builders.

One barometer of the diffusion of manufacturing technology in the U.S. machine tool industry is the number of numerically controlled (NC) machine tools in use in machine tool plants. A study by the U.S. Army in 1978 revealed that a sample of 25 percent of all U.S. manufacturing companies with 20 or more production workers, only 4 percent of the machine tools in use were NC.

According to industry sources, the West German and U.S. machine tool producers are world leaders with respect to their technology of flexible manufacturing systems (FMS). ^{2/} One Taiwan company, with a strong research capacity, has developed a FMS, and combined its horizontal machining center and CNC lathes with an electromagnetic induction guiding cart, industrial robots, and other fixtures. ^{3/}

Generally machine tools from Korea and Taiwan are priced lower than comparable American-made machine tools. However, some U.S. producers are starting to produce certain types of machine tools for markets they have previously neglected. These machine tools are standard, instead of custom, products and will be price competitive with foreign-made products. Despite these recent developments, U.S. machine tool producers still claim that sales have been lost to Asian competitors due principally to price.

International markets

Apparent world consumption of metalworking machine tools by the 10 largest consuming countries increased dramatically to \$19.1 billion in 1981, or by 193 percent, from the \$9.9 billion consumed in 1977 (fig. 3). Consumption by these 10 countries dropped to \$16.3 billion in 1982. During 1978-82, the United States was the largest consuming nation of machine tools, and accounted for 26 percent of consumption in 1982. Taiwan's consumption increased from \$145.2 million in 1979 to \$180.6 million in 1982. Korean consumption of machine tools totaled \$185 million in 1977, reached a peak of \$546 million in 1979, then declined to \$385 million in 1982. In 1982, the three next largest machine-tool-consuming countries were the Soviet Union, Japan, and West Germany, in order of magnitude, and together with the United States accounted for 50 percent of total consumption of the 10 major consuming countries. (Korea was the 10th largest consuming country in 1982.)

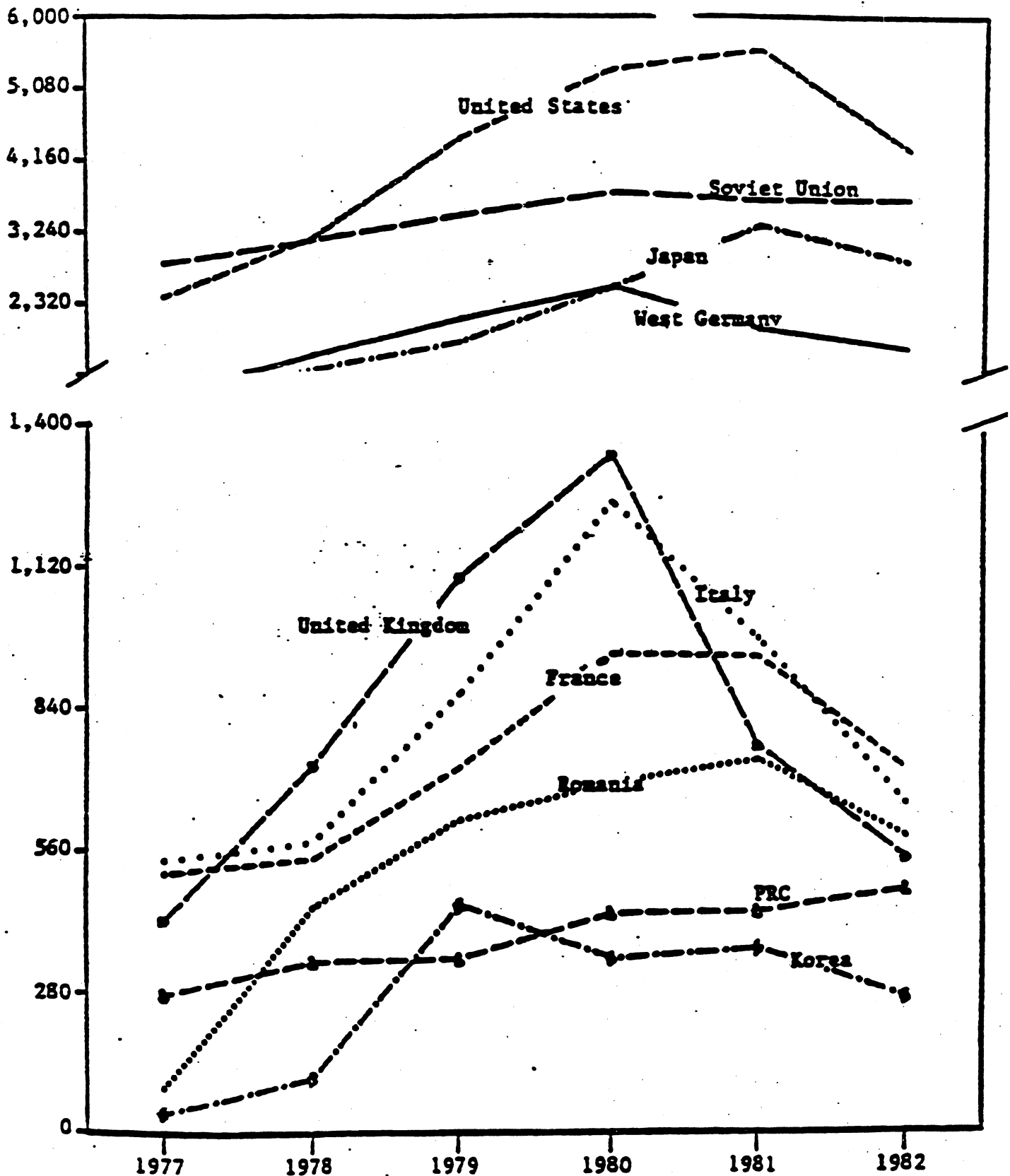
^{1/} The Competitive Status of the U.S. Machine Tool Industry, National Academy Press, Washington, DC, 1983, p. 25.

^{2/} Iron Age, Nov. 24, 1980, pp. 119 and 120.

^{3/} The Journal of Commerce, Oct. 11, 1983.

Figure 3.--Metalworking machine tools: Major countries' consumption, by values, 1977-82.

Million
dollars



Source: American Machinist.

The demand for machine tools increased during 1977-81 primarily because of the retooling that was occurring in the automotive, aircraft, defense, and oil and gas equipment industries. In 1982, with a world oil glut, and with the major purchasing industries having already retooled, the world experienced a decline in consumption of machine tools.

U.S. exports

The major markets for U.S. exports of metalworking machine tools and parts have shifted during 1963-81. In 1963, Japan was the major U.S. export market, accounting for \$25.4 million, or 13 percent, of total U.S. exports. In 1967, 1972, and 1977, Canada was the leading export market. In 1981, Mexico was the principal U.S. export market, accounting for \$261.3 million, or 25 percent of U.S. exports. Other important markets for U.S.-made machine tools and parts during 1963-81 were the United Kingdom, West Germany, France, Brazil, and Australia.

Selected country exports

Korean and Taiwan exports, in terms of value, rose from \$0.2 million in 1963 to \$223.3 million in 1981.

Korea.--Korean exports of metalworking machine tools to world markets, in terms of value, increased from \$2,000 in 1963 to \$34.7 million in 1981. Exports as a share of domestic production increased from 3.5 percent in 1977 to 19.6 percent in 1980, then decreased to 17.9 percent in 1981. The major markets for Korean exports in 1981 were the United States, Japan, Saudi Arabia, Australia, Indonesia, West Germany, and Canada. In that year, Korean exports of these products to the United States exceeded the combined exports of these products to the remaining six leading Korean export markets.

The Korean Government has designated the machine tool industry as a strategic export industry. Plans call for annual exports of machine tools to rise from current levels to \$550 million in 1986, with output projected to increase from \$200 million in 1981 to \$950 million in 1986 (if successful, this plan will raise Korea's position among the world suppliers from 18th to 10th). 1/

Taiwan.--Taiwan exports of metalworking machine tools to world markets, in terms of value, increased from \$0.2 million in 1963 to \$188.6 million in 1981. Exports as a share of production ranged from 85 percent in 1977 to 75 percent in 1982. Major markets for Taiwan exports are the United States, West Germany, and Austria; exports to these countries accounted for two-thirds of total exports of machine tools in 1982, with exports to the United States representing 47 percent. 2/ In 1982, Taiwan was the world's 13th ranked exporter of machine tools, with exports of about \$150 million. 3/

1/ U.S. Embassy report, CMP Industry Sector Analyses Form, Aug. 31, 1983.

2/ U.S. Embassy report, Taiwan's Machine Tools, November 1983.

3/ Journal of Commerce, Oct. 11, 1983.

Conditions of competition in international markets

The product technology of U.S. machine tool producers is generally held to be internationally competitive. 1/ For certain products the United States has superior technology, simply because U.S. producers have concentrated on the development of these products. These products include large, sophisticated NC machine tools for use in the production of aircraft, military equipment, and other specialized products. Foreign producers, for the most part, are not competitive in these markets. However, in the market for small- and medium-sized NC machine tools, foreign producers are effective competitors. In particular, Japanese producers have concentrated production efforts in the area of standard NC machine tools. 2/

In certain categories of machine tools, different countries have the leading technology because they have concentrated on the development of these products. In a 1982 survey, U.S. purchasers of both U.S.-made and foreign-made machine tools were asked to rate producers with respect to the engineering of their products. 3/ Overall, U.S. purchasers rated U.S. producers only slightly higher than Japanese and West German producers. 4/ Taiwan producers were rated much lower than the three top rated producers. When U.S.-made and foreign-made machine tools were compared by industries using these products, U.S.-made machine tools were rated first among those companies in SIC 34 (fabricated metal products), in SIC 35 (machinery, except electrical), and SIC 36 (electrical machinery). Taiwan machine tools were rated first in SIC 33 (primary metals).

Taiwan machine tool production is concentrated in metal-cutting machine tools. In 1982, the ratio of metal-cutting to metal-forming machine tool production (based on value) was 18:1, and in 1981, it was 19:1, but in 1980, it was 31:1, and in 1979, about 27:1. However, in 1977, the ratio was 6:1.

The Taiwan machine tool industry has succeeded by offering machines of adequate quality at prices far below that of most other competitors. However, in order to continue to grow, the industry believes it will have to manufacture sophisticated, accurate machines. 5/

In order to upgrade the machine tool industry, Taiwan's machine tool manufacturers plan to establish an industrial park for the purpose of rationalizing the manufacture of CNE machine tools for export. 6/ This park is being set up under the auspices of the Taiwan Association of Machinery Industry and costs will be borne by the manufacturers. It is planned that production in the park will be rationalized with each manufacturer providing

1/ Iron Age, Nov. 24, 1980, pp. 119 and 120.

2/ Industrial Review of Japan/1982, March 1982 p. 91.

3/ Hitchcock Marketing and Research Services, Three Views of Machine Tool Marketing, Dec. 1982.

4/ Ibid.

5/ The Journal of Commerce, Oct. 11, 1983.

6/ U.S. Department of State Telegram, American Institute in Taiwan, Taipei, Feb. 3, 1984.

specific components and/or products to a proposed sales company. 1/ It is hoped that the Industrial Park will also attract foreign investment. 2/

The manufacturers in the machine tool park plan to sell the equipment through one large company which will operate as a sales and service agency. 3/ This company is planning to have at least two distribution and service centers in the United States. It is expecting to operate as a joint venture between 19 private companies and 2 public entities, the Bank of Communications, and China Development Corp. Furthermore, the Minister of Finance in Taiwan is developing guidelines which will permit participation by foreign-owned equipment leasing companies. Participation by such companies is expected to increase Taiwan-made machine and whole plant sales through the leasing of these items to the foreign firms. 4/

1/ Ibid.

2/ According to a Department of State telegram, a Taiwan Government official recently announced, that General Electric Corp., a leading U.S. manufacturer of CNC machines, will establish a joint venture in Taiwan to produce CNC equipment.

3/ U.S. Department of State Telegram, American Institute in Taiwan, Taipei, Feb. 3, 1984.

4/ Ibid.

Natural Gas

Description and uses

Natural gas is used as a fuel and petrochemical feedstock, and it is produced in conjunction with crude petroleum or by itself, and is primarily composed of low molecular weight hydrocarbons. "Wet" natural gas is a term used to describe natural gas as recovered from a well, whereas "dry" natural gas is a term used to describe natural gas that has had portions removed as natural gas liquids (NGL's), such as ethane, propane, butane, natural gasoline and isopentane, plant condensate, and other heavier components.

Wet natural gas is composed primarily of methane, ethane, propane, and butane as well as some heavier hydrocarbons. These heavier hydrocarbons are valuable and are recovered at natural-gas-processing plants, lease separators, and field facilities.

Methane, the major constituent of natural gas, is a colorless, odorless, tasteless, flammable gas which is lighter than air. It is the principal feedstock in the production of ammonia, methanol, and acetylene. It also has wide use in natural gas as a fuel in industry, commercial buildings, and homes.

Ethane, a colorless, odorless, flammable gas, slightly denser than air and relatively inactive chemically, is obtained by extraction from natural gas. Almost all recovered ethane is used as a petrochemical feedstock and about half of the ethylene produced in the United States is based on ethane. Small quantities of ethane are used for the manufacture of petrochemicals, infrequently as a fuel, or for the British thermal unit (Btu) enrichment of synthetic natural gas (SNG), and for blending into natural gas in pipelines to increase its Btu value. Ethane supplies are dependent on the quantity of natural gas extracted and processed. The trend toward increased percentage recovery at gas-processing plants is counterbalanced by an overall decline in the ethane content of natural gas. A reduction in ethane extraction would affect the availability of ethane feedstock for the petrochemical industry.

Propane, a colorless, flammable gas, is heavier than air and is derived primarily from natural gas. The quantity and purity of the propane obtained from natural gas depends principally on the processes used. Refrigerated absorption processes yield propane with a purity of 98-liquid-volume percent, while the use of extremely low temperature techniques (i.e., cryogenic processes) yields propane with a purity of 99-liquid-volume percent. Propane below 90-liquid-volume percent purity is often used as fuel and is often called liquefied petroleum gas (LPG). Mixtures of ethane and propane, and propane and butane may be used as fuel and can be used as a petrochemical feedstock.

Butane, a colorless gas, consists of a mixture of n-butane, 1/ and isobutane 2/ obtained from the processing of natural gas or the refining of crude petroleum. The quantity of butane recovered from natural gas depends on the butane content of the natural gas and the processing techniques used.

U.S. industry profile

Approximately 5 percent of natural gas production is used as raw materials for petrochemical feedstocks. The remaining 95 percent is used by residential consumers and the commercial and public sectors as fuel.

Channels of distribution for natural gas products involve few steps. Natural gas extractions at the wellhead are either sent to natural-gas-processing plants to separate NGL's or are piped, via transmission companies, to industrial consumers or to distribution companies. Then, the natural gas is transmitted through the city gate, 3/ to the local utility companies.

Texas and Louisiana are the major natural gas-producing States and account for an estimated 70 percent of total marketed production. Areas in North Dakota, the Rocky Mountains, and offshore Louisiana are expected to yield new finds of natural gas; the Alaskan discoveries are not expected to yield significant amounts of natural gas until the late 1980's.

In 1981 and 1982, the U.S. natural gas industry was affected by a decrease in demand, due in part to a surplus of natural gas resulting from increased drilling activity. Industry sources estimated that the number of U.S. firms engaged in the exploration and production of natural gas exceeded 19,000 in 1982. The top 15 of these firms represented about 48 percent of total production.

Most petroleum companies in the United States produce natural gas. It is extracted simultaneously with crude petroleum or by itself. (Often a well is drilled looking for crude petroleum and natural gas is discovered instead.) Therefore, separate data on the natural gas industry are often not available. Standard Industrial Classifications (SIC) No. 1311 encompasses both crude petroleum and natural gas production. In 1983, SIC No. 1311 shows that about 200,000 workers were employed in the U.S. crude petroleum and natural gas industry.

To the extent that any loss of domestic and/or international market share results from targeting practices, the corresponding absence of each \$1 million in production not undertaken by U.S. petroleum and natural gas producers would translate into an estimated five workers displaced in all sectors of the U.S.

1/ Hydrocarbons whose molecules contain a straight chain of carbon atoms are designated as n-butane (normal butane).

2/ Isobutane is a colorless gas derived from wet natural gas, refinery gas, or from the isomerization of butane. Its primary uses are as a fuel, refrigerant, or a starting material for organic synthesis.

3/ The city gate refers to the point where pipelines deliver the gas to the city at which time prices are established for the purchase of the gas by the local distributors.

economy (based on 1982 production/employment relationships), according to the staff of the U.S. International Trade Commission, using the BLS input-output model, as shown in the following tabulation:

Industry sector	Displaced employment
	<u>Number</u>
Petroleum and natural gas	2
Other manufacturing	1
All other	2
Total	5

Foreign industry profile

Canada.--The natural gas industry is affected by the NEP. Estimated proved reserves of natural gas, including reserves in the frontier areas, were 90.5 trillion cubic feet, as of January 1, 1984. ^{1/} Western Canada accounts for about 37 percent of Canada's natural gas reserves; the Mackenzie-Beaufort Delta, 26 percent; the Arctic Islands, 20 percent; and the east coast, 17 percent.

In 1982, Canadian production of natural gas was about 2.6 trillion cubic feet. Approximately 68 percent of the natural gas produced was consumed domestically, 31 percent was exported, and 1 percent was either used as fuel in transmission in networks or reinjected into production reservoirs. Natural gas provides about 22 percent of Canada's total energy requirements. Of the natural gas produced in Canada, the Western provinces supply all of Canada's requirements.

Mexico.--PEMEX ^{2/} controls the natural gas reserves of Mexico, which were estimated at 75 quadrillion cubic feet, as of January 1, 1984. ^{3/} Approximately 70 percent of Mexico's natural gas is "associated" with crude petroleum production. Most of Mexico's "associated" natural gas is located in the areas of Reforma, Chicontepec, and the Gulf of Campeche; most of the "nonassociated" natural gas is located in the northern section of the country. In the area of Sabinas, more than 7 trillion cubic feet of dry natural gas are proved. Other areas with "nonassociated" natural gas reserves are Reynosa and the Gulf of Cortes.

In 1982, Mexico produced 1.6 trillion cubic feet of natural gas. Approximately 1.2 billion cubic feet per day of natural gas are consumed in crude petroleum field operations and 300 million cubic feet per day are used to generate electrical power in these petrochemical plants. Another 665 million cubic feet per day, or 17 percent of total production of natural gas, was vented or flared in 1981. However, Mexico hopes to continue to decrease this amount to less than 2 percent of total production by the late 1980's. ^{4/}

^{1/} "Worldwide Report," Oil & Gas Journal, Dec. 26, 1983, p. 81.

^{2/} For information on PEMEX, see the "Crude Petroleum" section of this report.

^{3/} "Worldwide Report," Oil & Gas Journal, Dec. 26, 1983, p. 81.

^{4/} "Mexican Report," Oil & Gas Journal, Aug. 30, 1982, p. 92.

U.S. market

Natural gas is used as fuel by the industrial, commercial, and residential sectors of the economy. In the industrial sector, natural gas is used as both fuel and petrochemical feedstocks for the production of primary petrochemicals, which are used to produce petrochemical products such as synthetic fibers, rubber, and plastics. These petrochemical products are in turn used to produce such items as clothing, footwear, medical goods, packaging, and so forth, for sale to the consumer.

U.S. price controls on natural gas have kept prices on a Btu basis below parity with the price of crude petroleum. The lower price lead to increased consumption and lessened the incentive to increase production. The Natural Gas Policy Act of 1978 (NGPA) was designed to increase the price of natural gas over a period of several years through regulated decontrol and thus provide added incentive for further exploration and production.

The industrial sector was the major consumer of natural gas and accounted for 35 percent of total consumption in 1982. However, actual usage by the sector decreased by about 21 percent between 1980 and 1982, reflecting a general decline in U.S. industrial activity. ^{1/} The electrical utility sector accounted for about 13 percent of total domestic consumption in 1982. ^{2/}

U.S. production

Marketed production ^{3/} of natural gas decreased from 20.5 trillion cubic feet in 1979 to 16.7 trillion cubic feet in 1983. The following tabulation, derived from official statistics of the U.S. Department of Energy, shows U.S. production of natural gas from 1979-83:

	<u>Quantity</u> (million cubic feet)	<u>Value</u> (1,000 dollars)	<u>Unit value ^{1/}</u> (per 1,000 cubic feet)
1979-----	20,471,000	24,155,780	\$1.18
1980-----	20,180,000	32,086,200	1.59
1981-----	19,956,000	39,512,880	1.98
1982-----	18,520,000	45,559,200	2.46
1983-----	16,657,000	43,641,340	2.62

^{1/} Average wellhead price.

Production capabilities are linked to reserve levels of natural gas as shown in the following tabulation, derived from official statistics of the U.S. Department of Energy (in millions of cubic feet):

^{1/} "Projects Aim To Ensure Healthy Future for Natural Gas," Chemical & Engineering News, Apr. 25, 1982, p. 21.

^{2/} U.S. Department of Energy, Natural Gas Monthly, March 1983, p. xi, and February 1983, p. 14.

^{3/} Marketed production of natural gas refers to production representing gross withdrawals less gas used for repressuring and quantities vented and flared.

	<u>Reserves</u> <u>(million cubic feet)</u>	<u>Ratio (percent) of</u> <u>reserves to production</u>
1979-----	97,299,000	4.45
1980-----	97,102,000	4.44
1981-----	98,339,000	4.56
1982-----	98,711,000	4.88
1983-----	94,498,000	5.14

Under the NGPA, the price of natural gas was to be gradually decontrolled by January 1, 1985. Price controls in effect from the early 1960's through 1978 were the primary reason for decreasing production. ^{1/}

U.S. imports

U.S. imports of natural gas decreased from 1.3 trillion cubic feet, valued at \$2.8 billion, in 1979 to 914 billion cubic feet, valued at \$4.2 billion, in 1983. The decrease in volume is attributed to the price of the imported natural gas which is approximately \$2 per thousand cubic feet higher than the U.S. gulf coast price of domestic natural gas. The following tabulation, derived from official statistics of the U.S. Department of Commerce, shows U.S. imports of natural gas from 1979 to 1983:

<u>Unit value</u>	<u>Year</u>	<u>Quantity</u>	<u>Value</u>
		<u>(million cubic feet)</u>	<u>(1,000 dollars) (per 1,000 cubic feet)</u>
1979-----	1,267,441	2,765,408	2.18
1980-----	968,627	3,936,729	4.06
1981-----	858,931	4,117,925	4.79
1982-----	890,028	4,391,080	4.93
1983-----	913,777	4,177,795	4.57

The major sources of U.S. natural gas imports were Canada and Mexico, primarily due to location and existing pipeline systems. Algeria was the leading source of U.S. imports of liquefied natural gas during 1979-83.

^{1/} As a result of a 1954 Supreme Court decision, (Phillips Petroleum Co. v. Wisconsin), 347 U.S. 672. The price of gas produced and sold within a State is unregulated; however, if gas is produced in one State and sold in another, the Federal Power Commission was empowered to regulate prices at the wellhead. (The Federal Energy Regulatory Commission, within the U.S. Department of Energy, has retained the functions of the former Federal Power Commission). The cost of natural gas is determined at the wellhead based on service, expenditure, and inventory costs. Prices are regulated on the basis of the maximum local price established under the NGPA. Different prices are set for more recent gas discoveries. In order to charge the higher maximum local price, contractual authorization is established between producers and pipeline companies, and presented to the State jurisdictional agency. Certain criteria, established by NGPA, must be met before the State can authorize the use of the higher maximum local price. The Federal Energy Regulatory Commission (FERC) is then informed of the price increase by the State.

Conditions of competition in the U.S. market

Imports account for a very small share of U.S. apparent consumption of natural gas, as shown in the following tabulation:

<u>Year</u>	<u>Apparent consumption (million cubic feet)</u>	<u>Ratio (percent) of imports to consumption</u>
1979-----	21,678,700	5.8
1980-----	21,099,596	4.6
1981-----	20,755,437	4.1
1982-----	19,357,018	4.6
1983-----	17,516,004	5.2

The price of domestically produced natural gas, controlled under the provisions of the NGPA, increased from \$1.18 per thousand cubic feet in 1979 to \$2.62 per thousand cubic feet in 1983. During the same period, the average import price rose from \$2.18 per thousand cubic feet in 1979 to \$4.57 per thousand cubic feet in 1983.

International markets

The United States is the world's largest consumer of natural gas. Few industrialized nations have natural gas resources, and they often lack pipeline infrastructures necessary to transport the natural gas if it were available. Other nations, such as those in OPEC, possess natural gas resources and produce natural gas, but lack local markets and pipeline systems. Often these nations flare, or burn their natural gas in the atmosphere with no commercial return. However, many of these nations are now planning ways to commercially utilize this natural gas.

Natural gas trade has taken place between Canada, Mexico, and the United States for sometime. Some sections of the United States, such as the Midwest and Pacific Northwest States, are heavily dependent on Canadian natural gas, consuming approximately 90 percent of total U.S. imports from Canada. Natural gas from Mexico entered the United States in early 1980 under an agreement between a U.S. joint venture ^{1/} and PEMEX which called for an estimated 300 million cubic feet per day of natural gas to be exported to the United States.

In 1976, as part of the national crude petroleum and natural gas plan, Mexico announced its intention to rely on crude petroleum for domestic energy needs and to export most of its associated natural gas to the United States. ^{2/}

^{1/} The U.S. joint-venture consisted of several U.S. based petroleum and pipeline companies.

^{2/} Congressional Research Service, Issue Brief #1B7905, p.5.

However, in 1978, in the aftermath of unsuccessful U.S.-Mexican negotiations related to the objections of the United States to allow natural gas prices to be based on parity with crude petroleum prices, the plan was reevaluated. ^{1/} In 1979, the Mexican Government pledged that their natural gas reserves would be used primarily for domestic consumption except for 300 million cubic feet per day which was to be sold to the United States. The Mexican Government then offered low-cost natural gas to Mexican industrial and electrical users as an incentive to use natural gas.

The Government-owned Federal Electricity Commission (CFE), which produces 95 percent of Mexico's electric power, recently converted boilers from petroleum to natural gas. The Mexican Government also mandated that any new electric utility plant be capable of using natural gas as well as crude petroleum. ^{2/} In 1979, CFE consumed approximately 1.1 billion cubic feet per day of natural gas and approximately 1.4 billion cubic feet per day in 1981. ^{3/} CFE has plans to double its electricity-generating capacity by 1988 and could conceivably increase its natural gas consumption to 2.8 billion cubic feet per day.

U.S. exports

U.S. exports of natural gas are negligible, accounting for less than 1 percent of U.S. output. The cost of transporting natural gas is high, therefore, little is exported.

U.S. exports of natural gas are shown in the following tabulation, derived from official statistics of the U.S. Department of Commerce:

<u>Year</u>	<u>Quantity</u> (million cubic feet)	<u>Value</u> (1,000 dollars)	<u>Unit value</u> (per 1,000 cubic feet)
1979-----	59,761	130,158	\$2.18
1980-----	49,031	225,353	4.60
1981-----	59,494	335,021	5.63
1982-----	53,010	292,748	5.52
1983-----	54,773	268,118	4.90

Japan is the major market for U.S. exports of natural gas, accounting for 99 percent of the total U.S. exports in 1983. Alaskan LNG is exported, primarily to Japan, rather than shipped to the lower 48 States because there are no receiving terminals on the U.S. Pacific coast and the Merchant Marine Act of 1920 (the Jones Act) (46 U.S.C. 883) requires U.S. flagships to carry interstate seaborne trade; however, no U.S. flag LNG tanker exists.

^{1/} Ibid.

^{2/} "Marketing in Mexico," Overseas Business Reports, U.S. Department of Commerce, OBR 81-09, May 1981, p. 10.

^{3/} Congressional Research Service, op. cit. p. 6.

Canadian exports

The United States is the only market for Canadian exports of natural gas. The Canadian industry uses revenues from natural gas sales to the United States in order to further develop its resources, and the United States benefits from the ease of transportation of natural gas located so close to its borders. The following tabulation, derived from official statistics of the U.S. Department of Commerce, shows U.S. imports of Canadian natural gas:

<u>Year</u>	<u>Quantity</u> (million cubic feet)	<u>Value</u> (1,000 dollars)	<u>Unit value</u> (per 1,000 cubic feet)
1979-----	997,883,594	2,468,370	2.47
1980-----	778,509,214	3,235,063	4.16
1981-----	716,276,608	3,401,002	4.75
1982-----	748,219,212	3,665,902	4.90
1983-----	691,035,752	3,153,267	4.56

The primary reason for the recent decline in U.S. imports from Canada was price. In 1982, five U.S. natural gas transmission companies declined to import the minimum amounts of natural gas that they were under contract to purchase from Canada, claiming that the high price made the gas unmarketable in the United States. As of April 11, 1983, Canada reduced the border price of natural gas to the United States to \$4.40 per thousand cubic feet in an effort to restore exports to the United States to previous levels.

Mexican exports

Beginning in 1979, Mexico exported 300 million cubic feet per day of natural gas to the United States via the pipeline which connects to the U.S. pipeline system in Texas. Natural gas exports from Mexico to the United States are shown in the following tabulation, derived from official statistics of the U.S. Department of Commerce:

<u>Unit value</u>	<u>Year</u> (million cubic feet)	<u>Quantity</u> (1,000 dollars)	<u>Value</u> (per 1,000 cubic feet)
1979-----	-----	-----	-----
1980-----	100,558,430	440,977	\$4.39
1981-----	104,750,568	511,332	4.88
1982-----	93,427,431	474,324	5.08
1983-----	75,624,432	379,268	5.02

Conditions of competition in international markets

In order to reach likely markets over considerable distances, natural gas must be transported by gas pipeline or in the form of LNG; in either case, large capital investments are necessary. Gas pipelines, once laid, are fixed in terms of direction and capacity. Although large initial investments are required, these costs are, in due course, offset by the low unit cost of transportation.

Expensive insulation and specialized equipment are needed to transport LNG by tanker. LNG requires special facilities for reception, revaporation, and distribution which may not be available in many developing nations.

Historically, the United States has been the major trading partner for Canada and Mexico. Both nations have recently attempted to diversify exports markets by limiting the amounts of natural gas sold to the United States. Although U.S. imports of natural gas are not expected to increase significantly from either Canada or Mexico in the near future because of the current oversupply on the domestic market, recent import price cuts could indicate a relaxation by both Canada and Mexico in their policies of limiting exports to the United States.

Semiconductors

Description and uses

Semiconductors are solid-state, crystal devices whose electrical properties are characteristic of materials that are neither conductors nor insulators. The electrical properties in these semiconductor materials (principally silicon) are created through the introduction of small amounts of impurities or dopants. The principal types of semiconductors are transistors and diodes (discrete semiconductors) and integrated circuits.

Semiconductor production involves a complex fabrication process requiring a large investment in plants and equipment. The major steps in production are wafer fabrication (including the fabrication of the raw wafer), assembly, and testing. Wafers are fabricated from high-purity silicon slices whose surfaces are etched, implanted, and metalized. The etched patterns (each a semiconductor chip) are produced by using photographic masks whose precise alignment is necessary to deliver close tolerances. These operations are performed in dust-free, clean rooms to avoid device failure through surface contamination. After fabrication of the wafers (which can contain hundreds of unscored integrated circuit or transistor chips) is completed, an initial probe test is performed and defective chips are separated out. The wafers are sectioned and usually exported to developing countries for package assembly, wire bonding, and encapsulation. Although these assembly operations are performed by low-cost labor, a high degree of dexterity is required to produce consistently error-free devices.

The finished semiconductors are returned to the United States for final testing and marketing. Because of this rationalization, developing countries account for a large share of both U.S. imports and exports. However, two of the largest U.S. firms that produce semiconductors for internal consumption have not rationalized production abroad. Instead they have automated their final assembly and encapsulation operations in the United States.

U.S. industry profile

The semiconductor industry is an outgrowth of the point-contact transistor developed by Bell Laboratories in 1948. This discovery was followed by the development of the integrated circuit during the early 1960's. Initial uses of semiconductors were limited to operational amplifiers, logic circuits, and shift registers, which were incorporated into computers and other electronic products displacing vacuum tubes. At present, semiconductors are complex devices containing thousands of components and performing hundreds of electrical functions.

Semiconductors are produced by 112 firms operating about 545 establishments in the United States, with four of these firms accounting for about 60 percent of U.S. shipments. This concentration in the industry remained relatively unchanged during 1978-82, although captive firms became more important as independent semiconductor firms were merged with large end-product producers. Major semiconductor establishments are located in Texas, New York, and California.

Persons employed in the semiconductor industry represent some of the highest skilled engineers, scientists, and technical personnel found in the U.S. electronic industry. Manufacturing operations, including the design and fabrication of masks and the production of wafers and semiconductor products, require not only unusual engineering skills, but also a thorough knowledge of complex machines and processes. A high degree of skill is also required for the design of software packages that serve as instructions for product use. Employment in the semiconductor industry increased from an estimated 135,000 persons in 1978 to 197,000 persons in 1982 (table B-63, app.).

To the extent that any loss of domestic and/or international market share results from targeting practices, the corresponding absence of each \$1 million in production not undertaken by U.S. electronic component manufacturers would translate into an estimated 38 workers displaced in all sectors of the U.S. economy (on the basis of 1982 production/employment relationships), according to the staff of the U.S. International Trade Commission, using the BLS input-output model, as seen in the following tabulation:

Industry sector	Displacement of employment (Number)
Electronic components-----	20
Other manufacturing-----	8
All other-----	10
Total-----	38

Foreign industry profile

Korea.--The principal producers of semiconductors in Korea are U.S. firms operating assembly plants. In 1983, U.S. firms accounted for more than 96 percent of Korean semiconductor exports. ^{1/} Korean producers, however, have announced that they intend to become a competitive force in the sale of semiconductors, particularly mass-produced computer memory devices. In 1983, the Samsung Group invested \$125 million in a 297,500 square foot plant with a capacity to produce 6 million integrated circuits per month. Production in the Korean plant will be supported by a U.S. subsidiary owned by Samsung (Tristar Semiconductor, Inc.), which has opened a 5-inch wafer fabrication

^{1/} "Jockeying For Position in the Korean Chip Race," Electronic Business, July 10, 1984, p. 72.

facility in California. The product line produced by the Samsung Group will be designed in California and mass produced in Korea. The Samsung Group reportedly plans an additional investment of \$400 million to develop facilities with a projected total capacity of 80,000 wafers and 24 million memory units per month. The facilities are to be completely on stream by 1987. In addition, the Hyundai Group has announced plans to invest \$400 million in semiconductor production by 1987. Hyundai plans to produce 200,000 5-inch wafers and 15 million very large scale (VLSI) integrated circuits in its initial stage of production. Hyundai has also established a design subsidiary (Modern Electronics Systems) in California.

Although the Korean semiconductor industry at present is small, planned capacity by Samsung and Hyundai, and to a lesser degree by Gold Star and Daewoo, is significantly greater than needed to supply Korean domestic markets. The excess capacity will be sold in export markets, probably in the United States, a major market for semiconductors. Until the planned capacity can be made operational, however, Korean producers will account for only a small share of world semiconductor exports.

Mexico.--The semiconductor industry in Mexico largely consists of U.S. firms assembling integrated circuits and transistors. Reportedly, Mexican electronics firms have neither the technology nor the plant capacity to produce semiconductors.

Taiwan.--Like the industry in Mexico, the semiconductor industry in Taiwan consists of U.S. firms assembling circuit chips into carriers and performing encapsulation and marking operations. Electronic firms in Taiwan accounted for a only a small share of trade in semiconductors.

Brazil.--In 1983, about 17 firms produced semiconductors in Brazil. Of these firms, 16 were reportedly producers of discrete semiconductors, principally transistors and diodes. The remaining firm was U.S.-owned (Philco-Ford) and was the only producer of integrated circuits in the country. Because of policies regarding high technology products adopted by the Brazilian Government, the plant was closed and ultimately sold to Brazilian-owned Sharp Electric Co. in February 1984. The closing of the plant by the U.S. firm was brought about because current Brazilian policies permit only Brazilian ownership of facilities producing micro- and minicomputers and semiconductors.

U.S. market

The U.S. market for semiconductors includes virtually all domestic producers of electronic end products. Producers of digital computers are the largest market, accounting for about 35 percent of domestic semiconductor shipments. Computer producers have accounted for this share of domestic shipments over a period of years even as the market showed a multibillion-dollar expansion. A large share of the computer market is served by vertically integrated computer producers. Following computer producers, producers of consumer and military electronics are the next largest markets, accounting for about 20 percent of domestic shipments. The remainder of the domestic market is accounted for by various end-product producers, including producers of communications equipment, process control equipment, and automobiles.

U.S. shipments

U.S. producers' shipments of semiconductors increased from \$5.4 billion in 1978 to an estimated \$10.4 billion in 1982 (table B-63). During the period, apparent U.S. consumption increased even faster, rising from \$5.2 billion to \$10.8 billion. Much of the growth in shipments of semiconductors was related to a strong growth in demand for integrated circuits. In 1982, integrated circuits accounted for about 80 percent of the value of total domestic shipments.

More than half of U.S. shipments of semiconductors are transfers (captive shipments) to end-product divisions within the same firm. As a result, marketing and distribution are usually determined by decisions that are related to the production of the end product. Typical distribution problems concerning final price, delivery, and quality are minimized, and the division producing the end product is assured of a controlled source of supply. Captive producers often purchase semiconductors in the open market, however, during the periods of strong internal demand. Shipments to the open market (merchant market), on the other hand, are largely determined by negotiated contracts with large, original-equipment manufacturers or by purchases made by independent distributors.

U.S. imports

Imports of semiconductors are a growing and important item of trade. During 1978-82, imports increased from \$1.7 billion to \$4.2 billion, representing an average annual increase of 28 percent (table B-63). The largest increase occurred in 1980 when imports rose by \$898 million. Malaysia was the largest supplier during the 5-year period, accounting for 21 to 26 percent of imports. Singapore, Japan, and the Philippines were also large suppliers, and, when combined with Malaysia, accounted for 68 percent of U.S. imports in 1982. About 78 percent of U.S. imports were accounted for by U.S. semiconductor producers that operate assembly plants in developing countries, principally in the Far East. As a share of apparent U.S. consumption, imports increased from 26.9 percent in 1978 to an estimated 39.1 percent in 1982.

Conditions of competition in the U.S. market

Producers in Korea, Taiwan, Mexico, and Brazil have not been a factor in the U.S. market except through the rationalization of U.S. semiconductor production. However, as indicated earlier, increased competition is expected from Korean producers after 1987.

International markets

Principal markets for semiconductors are located in the United States, Japan, and Western Europe, where a large share of end products incorporating semiconductors are produced. Developing countries such as Malaysia, Taiwan, and Singapore are also emerging as growing markets because of their increasing consumer product industries. In relative market consumption by region in

1979, North America accounted for about 42 percent of the value of world semiconductor consumption followed by Japan and Europe with 26 and 24 percent, respectively. The rest of the world accounted for the remaining 8 percent.

The U.S.-based industry is characterized by strong technological leadership in all semiconductor markets and, along with its foreign subsidiaries, accounted for more than 60 percent of the value of world semiconductor shipments in 1981. The Japanese-based industry is also characterized by a strong technological base but one which is more narrowly focused in the production of semiconductors for computer applications and consumer electronics. The Japanese-based industry accounted for 25 to 30 percent of the value of world semiconductor shipments in 1981.

U.S. exports

During 1978-82, U.S. exports of semiconductors and parts increased by 95 percent, rising from \$2.0 billion to \$3.8 billion (table B-63). Malaysia, Singapore, and the Philippines accounted for the largest share of exports. These countries reflect the growing level of U.S. exports of chips and wafers (73 percent of the value of U.S. exports in 1981) transferred to plants in these countries for wire bonding, encapsulation, and testing. West Germany is considered the largest export market when exports under items 806.30 and 807.00 are not considered. West Germany is also an entry point into the European Community from which semiconductors can be transshipped to other Community members.

Exports of semiconductors from the United States do not reflect the substantive share of world markets served by U.S.-based semiconductor producers. U.S. producers have made extensive investments in plants and equipment in Western Europe for semiconductor production. Markets in Western Europe and Japan are more easily served by U.S. producers with the establishment of local production plants. Semiconductors produced and sold in Western Europe and Japan reduce the level of U.S. exports to those areas.

Conditions of competition in international markets

The principal strengths of U.S. semiconductor firms in international markets are related to an extensive semiconductor product line and a large investment in plants and equipment in Western Europe. During 1978-82, U.S. firms were dominant in international markets for advanced devices such as microprocessors and microcomputers. U.S. firms were dominant in the European market during the period largely as a result of producing semiconductors locally both to avoid the EC's high duty rate and to serve end-product firms, which give more favorable considerations to local producers. Since about 1978, in order to become more competitive, Japanese firms also began extensive investment in semiconductor plants in Europe, particularly in Ireland. Producers in Korea, Mexico, Taiwan, and Brazil have offered few semiconductor products for sale in international markets and account for a minimal world market share for these products.

Steel Mill Products

Description and uses

Steel is a generic term used to describe a variety of iron-carbon alloys. Although steel may contain other elements intended to enhance one or more properties (such as hardness, strength, or corrosion resistance) and may contain certain elements retained from raw materials, iron must predominate by weight. The different grades of steel are generally classified in four categories: carbon, stainless, tool, and other alloy.

After production, steel is generally solidified into semifinished shapes prior to rolling, drawing, or welding into such products as sheets and strip (used widely by the automotive industry), plates (used in construction, machinery, and industrial equipment), wire and wire products, rails and accessories, and pipe and tubing. Steel products are used in virtually all sectors of an industrial economy; their use far exceeds that of any other metal.

U.S. industry profile

In the U.S. market, sales of steel mill products are made either directly to end users or to service centers/distributors, which subsequently sell to end users. In 1982, about 20 percent of domestically produced steel was shipped to service centers/distributors; 80 percent was shipped directly to end users.

Steel importers have traditionally sold their steel to independent U.S. steel service centers/distributors. In recent years, however, many foreign steel producers (particularly those in the European Community) established wholly owned or affiliated service centers/distributors networks. In contrast, only three U.S. steel companies currently operate subsidiary service centers.

The seven largest steel producers in the United States accounted for about 70 percent of total raw steel production in 1982. These firms not only operated blast furnaces, steelmaking furnaces, and rolling and finishing facilities, but owned and operated mines that provided iron ore, coal, and limestone for the production of iron. In addition to the 7 largest firms, there were over 80 other U.S. steel producers, many of which were relatively small, nonintegrated companies that produced steel in electric furnaces, using recycled iron and steel scrap as their primary raw material.

According to a study conducted by the Office of Technology Assessment, ^{1/} slightly more than one-half of all technical personnel in the industry are employed in production and quality control, with somewhat less than one-fifth in engineering and research and development. Vertically integrated firms typically employ large numbers of technical people in production positions, whereas alloy/specialty firms typically employ a high proportion of technical people in quality control and marketing areas. These differences in the use of technical personnel are, to some extent, a reflection of the relative importance of these areas to the two industry segments. The nonintegrated segment employs the fewest technical people partly because of the greater simplicity of both that segment's processes and its products.

Employment levels during the 1950's and 1960's were higher, on the average, than during the 1970's. Between 1952 and 1960, the peak employment year was 1953, with 650,000 employees. According to data from the Bureau of Labor Statistics, ^{2/} output per man-hour rose slightly during this time period. During the 1960's, productivity grew more rapidly and by the late 1960's, a 36-percent increase in output per man-hour had been achieved compared with that of the 1952 level. Peak employment for the decade, 548,000 workers, was attained in 1965. Growth in productivity continued throughout the 1970's, with employment declining from a high of 531,000 workers in 1970.

Sharp declines in the number of employees have occurred since 1979, during which an average of 453,000 persons were employed in the industry versus a 1982 average of 289,000. This reduction reflects a number of factors, including reduced production and further increases in productivity that have resulted from structural and technological changes in the industry. An example of the degree to which productivity has increased is illustrated in a comparison of steel production in 1971 and 1981. In 1981, the industry produced 120.8 million tons of steel with 391,000 employees, which compares with a total of 487,000 employees in 1971, when a comparable tonnage was produced.

To the extent that any loss of domestic and/or international market share results from targeting practices, the corresponding absence of each \$1 million in production not undertaken by U.S. iron and steel manufacturers would translate into an estimated 21 workers displaced in all sectors of the U.S. economy (on the basis of 1982 production/employment relationships), according to the staff of the U.S. International Trade Commission, using the BLS input-output model, as seen in the following tabulation:

Industry sector	Displaced employment	
	Number	
Iron and steel-----		8
Other manufacturing-----		4
All other-----		9
Total-----		21

^{1/} Office of Technology Assessment, Technology and Steel Industry Competitiveness, Washington, DC, 1980, p. 363.

^{2/} U.S. Department of Labor statistics, as reported by American Iron & Steel Institute.

Foreign industry profile 1/

Korea.--Korean production and technology has advanced considerably over the early 1960's, when a few manufacturers composed the entire steel industry. At that time capacity was about 165,000 net tons per year, and steel was produced using open hearth furnaces, with limited electric furnaces. By the end of 1965, a transition to electric furnace production was largely completed with the installation of 14 electric furnaces, which had a combined annual capacity of approximately 865,000 short tons. These furnaces accounted for more than 75 percent of the country's total capacity (approximately 1.1 million tons). By June 1981, there were 16 electric furnace producers, with a combined annual capacity of 4.1 million short tons.

Steel sector growth was encouraged by the Korean Government in its Second Five Year Plan (1966-1971). As part of the plan, on April 1, 1968, the government commissioned the building of an integrated steelworks. Although the Korean Government approves all management level positions and policy decisions, decisions on matters such as pricing and marketing are made without direct government involvement. The company falls under the jurisdiction of Korea's commercial law; thus, it is not legally considered a government entity. Ownership is divided among three groups: 40 percent is owned by the public sector Korea Development Bank (KDB); 30 percent by the Korean Government; and 30 percent by private commercial banks and companies. The steel mill was completed in four phases, increasing annual capacity to 9.9 million net tons by 1983. The integrated steel mill produces a variety of flat-rolled products and wire rod.

The production of steel has been of central importance to the Korean economy as a major contributor to the growth of the gross national product (GNP) and exports. In 1981, steel production accounted for 4 percent of Korea's GNP and 9.4 percent of total exports. By 1982 steel production had increased to 12.6 percent of the country's total export value. 2/ In terms of crude steel output, Korea was the 15th largest producer in 1982, accounting for 1.8 percent (13 million short tons) of world steel production.

The company in which the government participates accounts for approximately 75 percent of Korean steel production. The remaining 25 percent of production is accounted for by 16 nonintegrated steel firms. Total steelmaking capacity in Korea rose from about 1 million tons per year in 1973 to 15.3 million tons in 1983. Capacity utilization has averaged 70 to 80 percent in 1983 among privately held firms, while capacity utilization of the firm in which the government participates has been close to 100 percent. 3/

1/ For supplementary information concerning the steel industries in these countries, see "The Rise of Steelmaking in the Developing Countries: State Intervention in the Market and its Effect on International Trade in Steel," by Verner, Lipfert, Bernhard, and McPherson, Washington, DC, 1984.

2/ American Metal Market, Oct. 7, 1983, p. 4A, and Ibid.

3/ Korean Iron and Steel Association.

Korean steel consumption has grown over the last two decades as the economy developed. Between 1972 and 1978, consumption rose an average of 28 percent a year. The rate of increase slowed to 2.8 percent a year during 1978-81, largely because of the effects of a severe recession. In 1982, steel consumption increased more rapidly, rising to 9.2 percent. ^{1/} Growth in steel consumption has principally been concentrated in two sectors: shipbuilding and construction. Steel consumption (in tonnage) as a percentage of total production by sector for 1983 was as follows: construction--54 percent, fabrication--23 percent, machinery--8 percent, shipbuilding--6 percent, and automotive--6 percent. ^{2/}

Korean Government projections indicate that between 1984 and 1991 steel consumption will grow at a rate of 7 to 10 percent per year and that by 1988 consumption will exceed domestic production. The expected shortfall in production is one reason the Korean Government plans to build another integrated steel mill at Kwangyang (see fig. 4). The first phase of construction is scheduled to be completed by late 1987, giving the plant an initial capacity of 3 million net tons per year of high-quality steel. The new mill at Kwangyang will help Korea to further its goal of self-sufficiency by providing higher qualities of steel than is presently available domestically.

Employment in the largest Korean steel firm in 1982 was approximately 14,000. ^{3/} Hourly wages in the Korean steel industry on the average are much lower than in the United States. ^{4/} This low labor cost coupled with its modern facilities has facilitated the Korean steel industry's position as an efficient, low-cost global steel producer.

Taiwan.--The steel industry in Taiwan, like the steel industry in Korea, is dominated by one government firm, although there are a number of smaller producers that produce low-grade products. In the mid-1970's, the government undertook an economic program that included the construction of an integrated steel mill. The government increased its responsibility for the facility when a major foreign investor withdrew and the Taiwanese private sector was unwilling or unable to put up the capital required for completion. The company is operated with a limited amount of government involvement in management and personnel matters, although control is exercised with respect to pricing matters.

Steel production, using scrap-fed electric furnaces had been minimal and consisted largely of low-grade products, such as rebar. The government plant began operations on December 16, 1978, with an annual capacity of 1.6 million short tons of crude steel. During the second phase of construction, completed in 1982, capacity increased to 3.5 million short tons a year. Under phase III the company's capacity will increase to about 6.2 million short tons by 1988 and under phase IV to 8.8 million short tons by 1992. The government-owned firm produces a broad range of basic mill products, including flat-rolled products, wire rod, and bars.

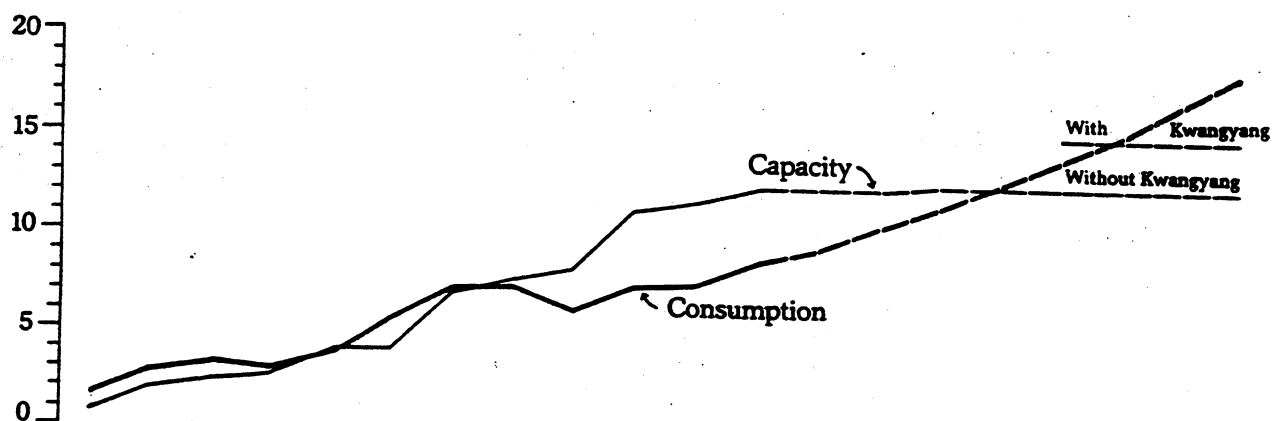
^{1/} Economic Planning Board, Republic of Korea.

^{2/} The Economist, Mar. 10, 1984.

^{3/} Department of State airgram, A-30, June 23, 1983.

^{4/} For a comparison, see table .

Figure 4
Steelmaking Capacity and Domestic Consumption of Korean Steel, 1972-91
 (Millions of Net Tons)



	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91
Sustainable Capacity ^a	0.8	2.0	2.4	2.7	4.1	4.2	7.1	7.8	8.4	11.3	11.8	12.6	12.6	12.6	12.8	12.8	15.2	15.2	15.2	15.2
Domestic Consumption ^b	1.8	2.9	3.2	3.0	4.0	5.9	7.2	7.5	6.1	7.5	7.6	8.9	9.6	10.6	11.7	12.9	14.2	15.6	17.2	18.9
Balance ^c	(1.0)	(0.2)	(0.8)	(0.4)	0.1	(1.7)	(0.1)	(0.4)	2.3	3.8	4.2	3.7	3.0	2.0	1.1	(0.1)	1.0	(0.4)	(1.9)	(3.6)

(a) Sustainable capacity, defined as the volume of production that can be attained annually over time taking into account maintenance, repairs and unanticipated disruptions due to problems with weather, labor and raw material deliveries, is estimated to be 90 percent of gross capacity, or roughly 12.6 million tons, and Kiyoshi Kawahito, "Issues of World Steel Production and Trade in the 1980's," Monograph series no. 26, Middle Tennessee State University, December, 1980, p. 9.

(b) Crude steel equivalent of consumption of finished steel products.

(c) May not add exactly due to rounding.

Source: Economic Planning Board, Republic of Korea.

In 1972, Taiwan produced about 595,000 short tons of steel, which increased to 6 million short tons in 1982, when Taiwan ranked as the 25th largest steel-producing country, accounting for 0.6 percent of world steel production. ^{1/} The government steel company accounted for about 64 percent of Taiwan's total 1982 steel production.

Taiwan's crude steel capacity was about 5.6 million short tons a year in 1983, of which 2.1 million tons is distributed among a number of relatively small firms. The vast majority of these smaller firms, with an estimated capacity of several thousand tons per year, melt scrap and produce simple mill products such as bars and small sections. The remaining capacity of 3.5 million short tons is held by the government-owned firm, which has operated at close to capacity. ^{2/}

Growth in both steel production and full capacity for Taiwan has been a central component of the economic plans of the government. The government steel company, which employed 7,800 workers in 1982, was created principally to supply growing heavy industries, such as shipbuilding and auto and machinery manufacturing, and to support the growing infrastructure. As Taiwan benefited from its major construction projects and growth in heavy industries, the government firm increasingly supplied the domestic industry, replacing imports primarily from Japan. Taiwan's markets for steel, as reflected in the shipments of the government-owned firm in 1983 were as follows:

<u>Steel consumption</u> <u>by market</u>	<u>Percent</u>
Steel piping-----	17.2
Hardware-----	17.0
Steel wire and cable----	16.5
Shipbuilding-----	11.3
Foundry-----	8.4
Bolts and nuts-----	7.7
Machinery-----	5.5
Building construction-----	4.2
Other-----	<u>12.2</u>
Total-----	100.0

Brazil.--Integrated steel production began in Brazil during the 1920's. The Brazilian steel industry experienced growth in both production and capacity beginning in the 1950's, largely because of a government effort to achieve self-sufficiency in steel production. Throughout the 1950's and 1960's Brazil's steelmaking capacity continued to grow, stimulated in part by the emergence of the automotive, appliance, packaging, and construction industries. Brazil is now the largest steel-producing country in Latin America, accounting for approximately 50 percent of the total production in the region. Capacity is approximately 22 million tons, and several new plants under construction will increase capacity to approximately 29 million tons per year.

^{1/} International Iron and Steel Institute, Statistical Yearbook, 1983.

^{2/} Prehearing brief of the Taiwan Iron and Steel Industries, Investigation No. TA-201-51, Carbon and Certain Alloy Steel Products.

The Brazilian iron and steel industry is divided into two sectors, government-owned and private. ^{1/} The industry is composed of 14 integrated steelworks and 27 nonintegrated firms. Production in the two sectors is covered by guidelines still in effect, which were established in 1971. Preference has been given in the government sector to expand steel projects rather than construct new ones, with an emphasis to be put on flat-rolled products. The three largest government steelmakers accounted for 54.2 percent of raw steel production in 1982. ^{2/}

Brazilian consumption of steel products grew at an average annual rate of 18 percent during 1968-74, whereas steel production grew at the rate of 9 percent a year. The imbalance resulted in an increase in steel imports to meet domestic demand. Additional difficulties as a result of the international oil crisis beset government plans for growth in the steel sector in 1975, forcing the adjustment of plans.

In 1982, Brazil's raw steel production declined for the second consecutive year from the peak production year in 1980 (16.8 million short tons). The country ranked as the 13th largest steel producer in the world in 1982 with 14.3 million short tons of steel production, accounting for 2 percent of world steel production. The consecutive declines in production largely resulted from a downturn in domestic consumption by the automobile, shipbuilding, and civil construction industries.

Mexico.--The Mexican steel industry is the second largest Latin American producer. The early development of the steel industry occurred as the economy shifted from a production economy of mining and agriculture to that of a semiindustrialized nation. In more recent years, although production and capacity have increased, the Mexican steel industry has had to confront a number of serious problems, one of the most significant being the recession in 1982-83.

Like the other three countries profiled, the Mexican steel industry is divided into two sectors, government-owned and private. The government sector, facing a number of serious problems, was reorganized to counter inefficiency, low productivity, and unprofitable operations through The National Development Plan of 1978-82. The government sector (SIDERMEX) is an entity established to administer policy for government firms and to coordinate the management and marketing activities of the government-owned steel companies. In addition to managing the Government companies, SIDERMEX also directs more than 80 affiliated businesses involved in the production of steel.

^{1/} Although the steel industry in Brazil began through private investment, the government found itself increasingly involved in the industry. The Iron, Steel & Non-Ferrous Metals Council, known as (CONSIDER), of Brazil's Industrial Development Council was created in 1968, with steel industry executives who served as consultants to the government. CONSIDER became a government agency in 1970 and as part of the Ministry of Industry and Commerce is responsible for carrying out government policy related to the steel sector, such as setting industry goals, establishing incentives, and regulating export-import flows. Siderurgia Brasileira SA (SIDERBRAS) was later created as a government holding company whose primary function is to coordinate the production goals of the government-owned steel firms (presently nine firms) with the national steel plan. In 1971 CONSIDER conducted the first of several long-range studies of the Brazilian steel market; the studies have shaped the Brazilian governments' policy toward steel development.

^{2/} Department of State airgram, A-22, Sept. 8, 1983.

The private steel sector comprises two large integrated steel firms and a number of smaller producers that together accounted for slightly less than 44 percent of Mexico's steel production in 1982. Of this total, the smaller producers accounted for 15.7 percent of production.

Both production and capacity in the Mexican steel industry increased during 1972-1982, with production doubling to a peak of 8.4 million short tons in 1981 before declining to 7.7 million in 1982. Capacity stands at about 9.4 million short tons. Mexico ranked as the 20th largest steel producer in the world in 1982, accounting for 1.1 percent of world steel production.

Domestic consumption of steel products increased after 1976 as a result of increased domestic demand by the oil industry and the appliance, construction, and automotive industries. In 1982, demand declined, as capital goods production fell 13.6 percent, automotive sector production declined by 25.7 percent, and construction output fell by 4.2 percent. Consumption in other steel-consuming sectors declined as well.

The shortage of skilled labor has been a major problem for the Mexican steel industry. As part of a country-wide effort to develop skilled workers, each of the country's basic industries, iron and steel included, is required to establish and sponsor educational programs to train people to enter the workforce, as well as provide curriculums to upgrade the skills of workers who are already employed. As a result of this effort and an expansion of the Mexican educational system, more skilled workers are presently available.

U.S. market

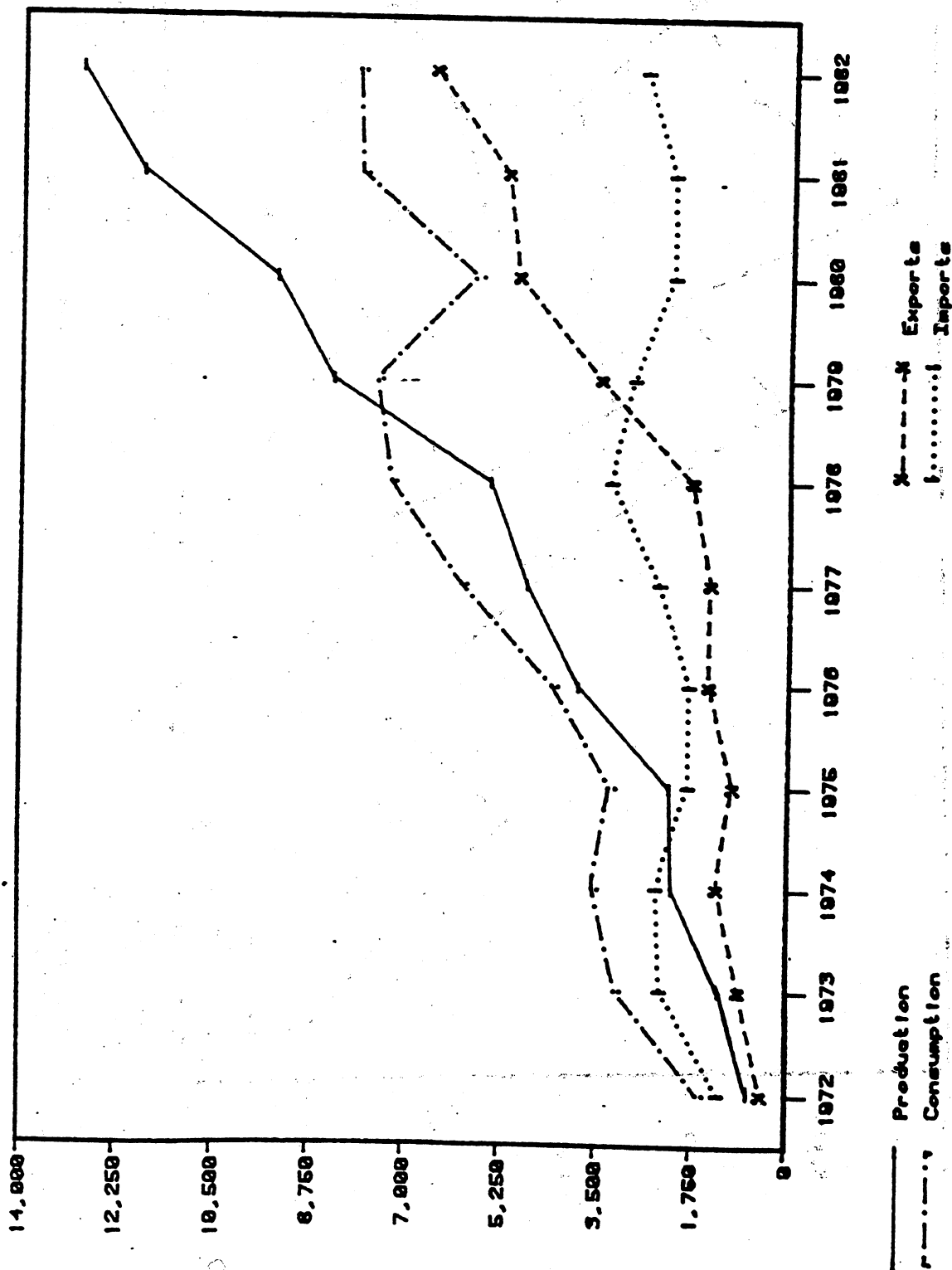
U.S. demand for steel over the past three decades has grown, albeit at a relatively low rate. Steel consumption per capita remained at approximately the same level during the period, whereas consumption per dollar of real GNP fell. With respect to steel markets, about 60 percent of steel shipments are made to the capital goods sector of the economy, making steel demand highly sensitive to capital spending levels. The largest markets for steel are the automotive and construction industries, followed by the container and packaging industry and the machinery and equipment industry.

During the 1950's, U.S. demand for steel averaged 72 million short tons per year; demand increased during the 1960's to an annual average exceeding 100 million tons during 1965-69. Growth continued in the 1970's, reaching a peak of 123 million tons in 1973. In the following years, demand fell, averaging 108 million tons during 1977-81. In 1982, the economic recession in the United States had a severe impact on the industry, as demand fell to 76 million tons, the lowest level since the early 1960's.

FIGURE 5

CRUDE STEEL PRODUCTION, STEEL MILL PRODUCTS CONSUMPTION, EXPORTS AND IMPORTS-SOUTH KOREA, 1972-1982

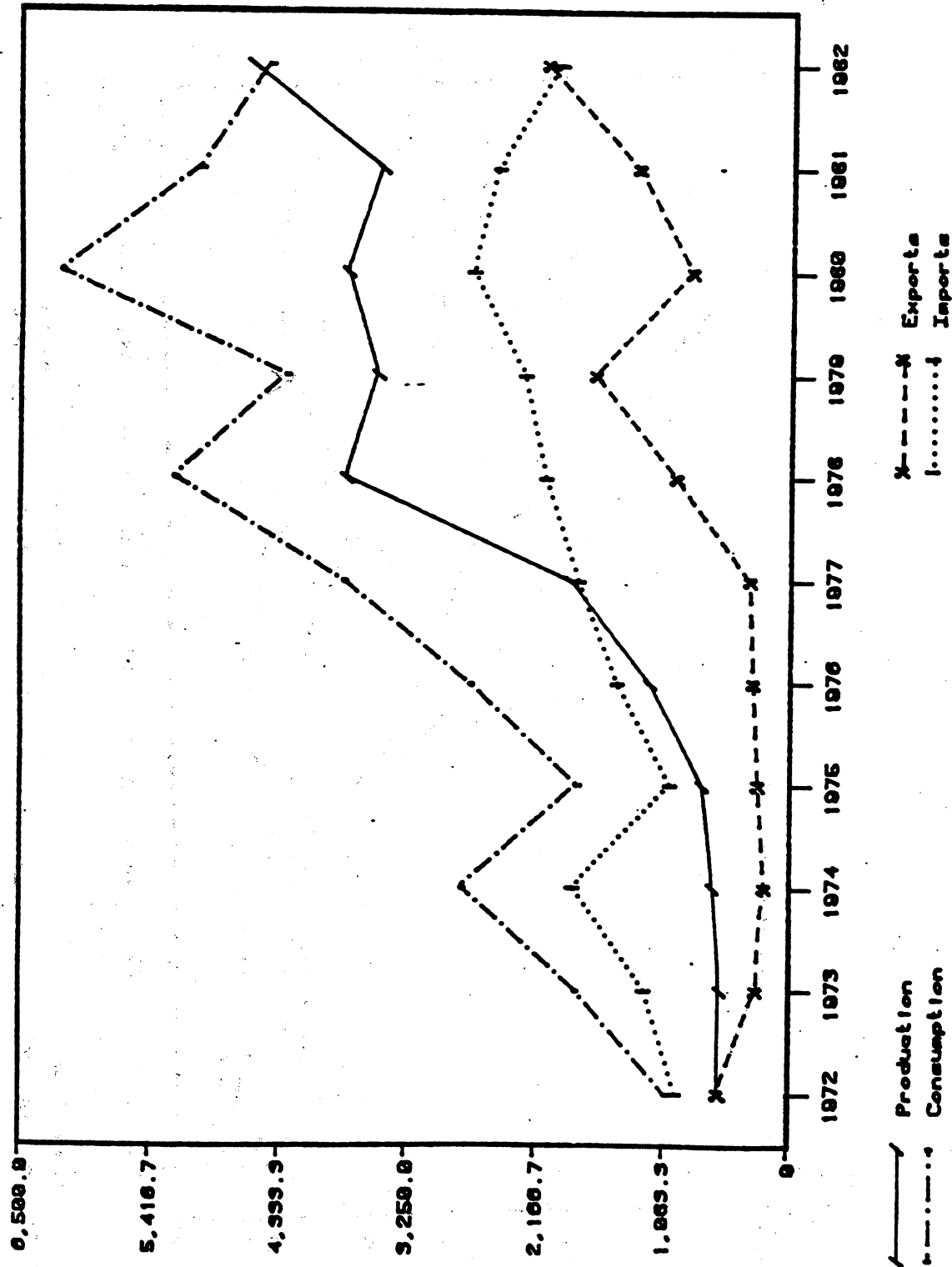
1,000 Net Tons



Source: International Iron and Steel Statistical Yearbook, 1982 and 1983.

FIGURE 6

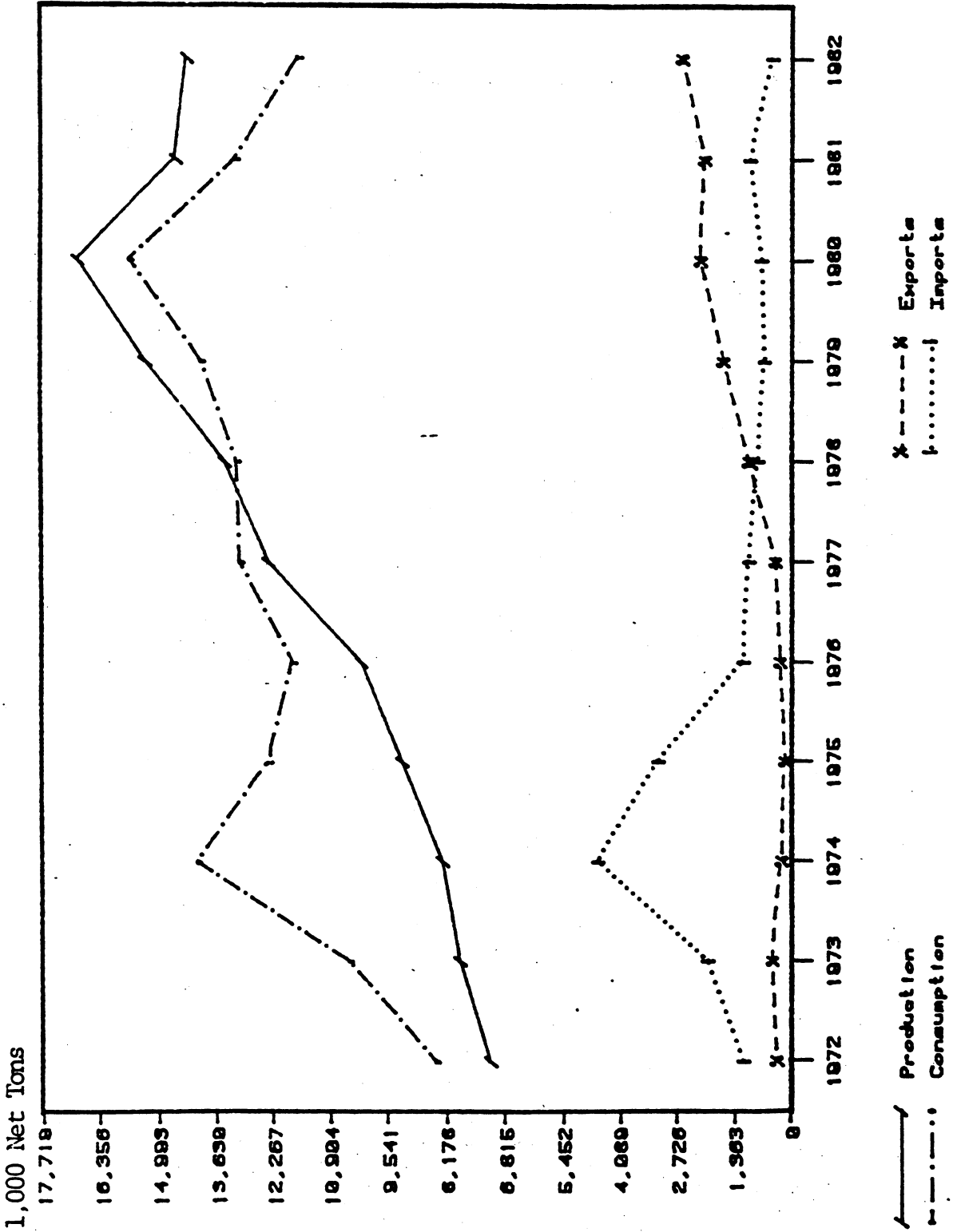
CRUDE STEEL PRODUCTION, STEEL MILL PRODUCTS CONSUMPTION, EXPORTS AND IMPORTS-TAIWAN, 1972-1982



Source: International Iron and Steel Statistical Yearbook, 1982 and 1983.

FIGURE 7

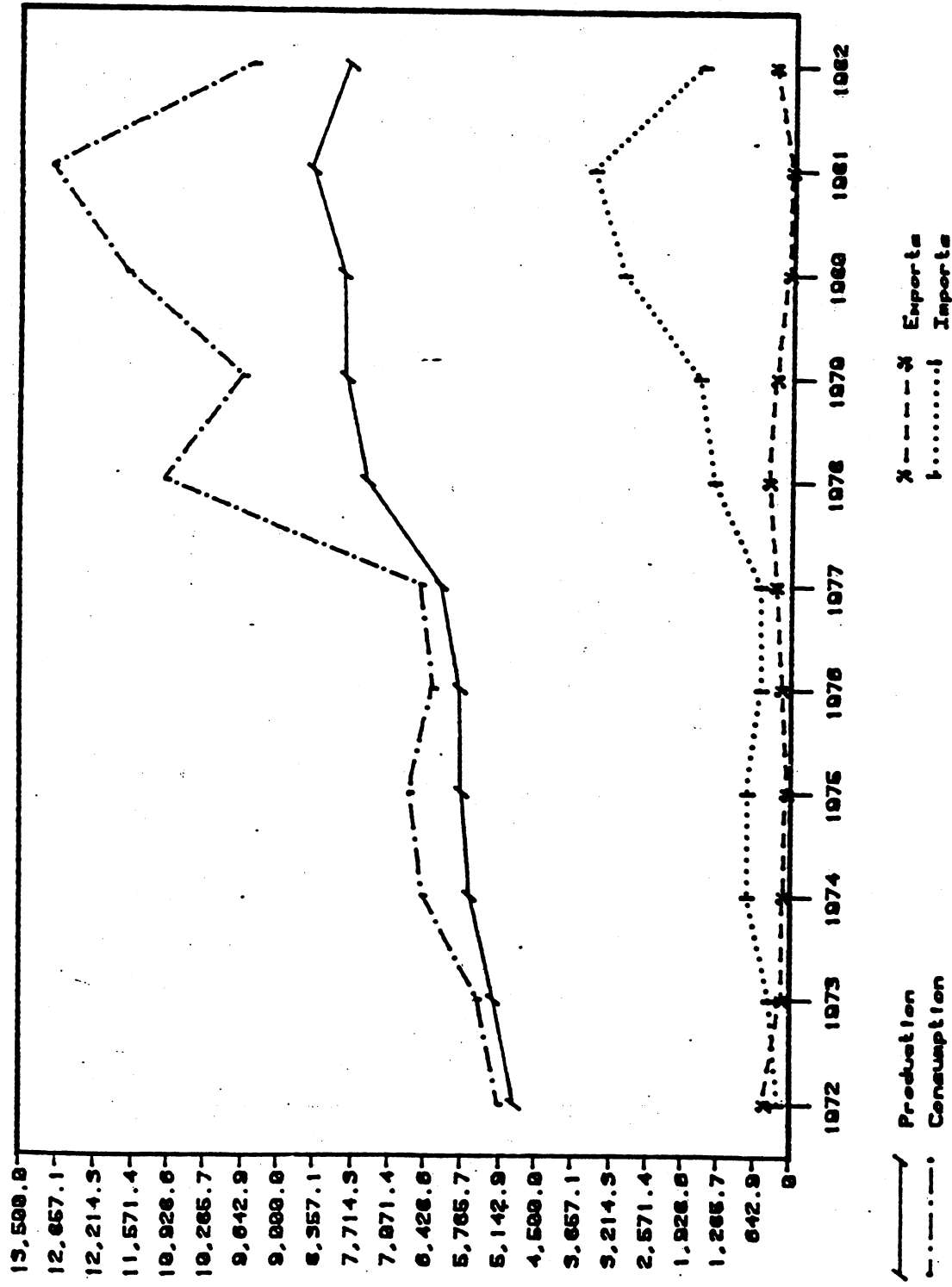
CRUDE STEEL PRODUCTION, STEEL MILL PRODUCTS CONSUMPTION, EXPORTS AND IMPORTS-BRAZIL, 1972-1982



Source: International Iron and Steel Statistical Yearbook, 1982 and 1983.

FIGURE 8

CRUDE STEEL PRODUCTION, STEEL MILL PRODUCTS CONSUMPTION, EXPORTS AND IMPORTS-MEXICO, 1972-1982



Source: International Iron and Steel Statistical Yearbook, 1982 and 1983.

U.S. shipments

The growth in steel demand in the United States through the early 1970's was accompanied by a corresponding increase in shipments. To accommodate this growth, steelmaking capacity was added, primarily during the 1950's, so that by 1960 the United States had a capacity of 140 million tons, representing an increase of 59 million tons over the 90-million-ton capacity in 1950. By 1974, capacity had increased to 155.5 million tons. Those sectors that accounted for growth in domestic shipments during the past three decades are presented in table 99.

Table 99.--Steel mill products: U.S. shipments by market classification, specified years 1954-82

Market classification	1954	1964	1974	1982
	-----1,000 net tons-----			
Distributors <u>1</u> /-----	9,948	13,845	20,400	13,067
Automotive-----	11,793	18,387	18,928	9,288
Construction <u>2</u> /-----	9,540	13,600	17,609	8,570
Containers-----	5,871	6,552	8,218	4,470
Machinery (industrial equipment tools)-----	3,517	5,338	6,440	2,584
All others-----	22,484	27,223	37,877	23,588
Total-----	63,153	84,945	109,472	61,567

1/ Excludes shipments to oil and gas supply houses.

2/ Excludes shipments to oil and gas industry.

Source: Compiled from statistics of the U.S. Department of Commerce.

Note.--Because of rounding, figures may not add to the total shown.

Throughout the period, the five largest markets for steel accounted for 60 to 70 percent of total steel shipments. In 1982 shipments were at a relatively low level, reflecting weakness in the construction and automotive markets. Although some of the weakness is cyclical in nature, structural changes in demand for steel in certain segments have affected steel usage rates. Steel, for example, has encountered competition in the container and packaging industries from aluminum and plastics. In the automotive industry, smaller cars are requiring smaller amounts of steel per vehicle, and some car parts that have traditionally been made of steel are now being made from other materials.

U.S. imports

During most of the 1950's the United States was a net exporter of steel. In 1959, however, the United States became a net importer when a 4-month strike cut domestic production and consumers sought alternate sources of supply. In that year, imports accounted for 6 percent of the market, as

opposed to less than 3 percent in previous years. Whereas, import levels fell somewhat in subsequent years, they maintained a higher share of the U.S. market.

In 1965, another year of labor contract negotiations, consumers hedged against a possible strike, which did not materialize, by increasing foreign purchases by more than 60 percent, to more than 10 million tons (10 percent of the market). These imports, competitively priced and of good quality, gained market acceptance, as evidenced by increases in imports in the next 2 years. During the labor contract negotiations in 1968, imports increased by 57 percent (to 18 million tons) and accounted for 17 percent of the market, despite the fact that no strike occurred.

After an increase in imports during the 1971 contract year, steel management and labor worked out an experimental negotiation agreement (ENA) in 1973, which eliminated the threat of a general strike, with binding arbitration in the event of negotiating difficulties. Although the ENA may have helped reduce the tendency toward increased imports in contract negotiation years, imports have continued to make inroads in the U.S. market, as is evident by the record 21.8-percent market share achieved in 1982.

The role of steel imports from all countries into the United States has increased substantially over the past three decades, as their share of U.S. consumption rose from an average of about 2.5 percent in the 1950's to 9.3 percent in the 1960's, and to 18.1 percent during 1978-82. Imports from EC countries rose as a percentage of consumption from an average of less than 2 percent in the 1950's to 6 percent during 1978-82. Imports from Japan also increased as a percentage of consumption, from a ratio of less than .05 percent during the 1950's to an average of 5.6 percent during 1978-82. Imports from the newly industrialized countries have also been rising, although at a slower rate than those from the EC and Japan. The ratio of imports to consumption from Brazil, Korea, Mexico, and Taiwan combined was only 0.1 percent in 1965. By 1970 it had increased to 0.3 percent, and by 1982 it had reached 2.5 percent of consumption. During 1978-82, the ratio of imports to consumption from these four countries averaged 1.7 percent, with growth occurring during 1980-83, particularly beginning in 1982, as shown in table .

With respect to the composition of imports from these countries, shipments have been a mixture of both high- and low-valued products. The primary Brazilian imports in 1982 were plates, wire rods, and sheet. In 1982, the major imports of Korean steel into the United States were pipe and tube, plates, and wire nails. Imports from Taiwan totaled 118,000 short tons in 1982, of which pipe and tube was the largest category, accounting for 90 percent of total U.S. imports. Imports from Mexico totaled 113,000 short tons, of which pipe and tube was also the largest category, accounting for 36 percent of total steel imports. Wire rods (a lower valued steel product) was the second largest category of steel imports, with a 27-percent share.

Table 100 ---Steel mill products: U.S. producers' shipments, exports of domestic merchandise, imports for consumption, and apparent consumption, by specified years, 1965-83

Year	Producers' shipments	Exports	Imports				Con- sump- tion	Ratio of--	
			Total	Brazil	Korea	Mexico	Taiwan	Imports from 4 countries to total imports	Imports from the 4 countries to consumption
									Percent
1965	92,666	2,496	10,383	7	2	124	-	100,553	1.3
1970	90,798	7,053	13,364	19	27	190	33	97,109	2.0
1975	79,957	2,953	12,012	1/	1/	51	1/	89,016	1/
1978	97,935	2,422	21,135	293	1,052	214	250	116,648	8.6
1979	100,262	2,818	17,518	432	986	160	109	114,962	9.6
1980	83,853	4,101	15,495	458	1,040	67	86	95,247	10.7
1981	88,450	2,904	19,898	548	1,218	41	131	105,444	9.7
1982	61,567	1,842	16,663	605	1,062	113	118	76,338	11.3
1983	67,584	1,199	17,070	1,257	1,728	651	117	83,455	22.3
									4.6

1/ Not available.

- Less than 500 tons.

Source: AISI statistical reports.

Note: All numbers have been rounded.

Conditions of competition in the U.S. market

During the past several decades, a number of actions in the area of trade affected conditions of competition in the U.S. steel market. In 1968, certain European countries and Japan reached voluntary restraint agreements (VRA's), which took effect on January 1, 1969, and lasted for 3 years. The VRA's were later extended, in modified form, until 1974. In 1976, quotas were imposed on specialty steel imports (i.e., stainless and alloy tool steel) for a 3-year period, which was subsequently extended until early 1980. In 1978, in response to trade problems in steel, the U.S. Government established the trigger-price mechanism (TPM) to monitor prices of steel imports (not including specialty steel) for possible violations of U.S. antidumping laws. The TPM was suspended in March 1980, reinstated in October 1980, and suspended a second time in January 1982, when steel companies filed antidumping and countervailing duty petitions. In October 1982, domestic petitioners withdrew certain antidumping and countervailing duty cases filed against EC countries, bringing into effect an intergovernmental arrangement affecting trade in steel products. Under the terms of the arrangement, EC countries will restrict certain exports to the United States through December 31, 1985.

Service, reliability, product quality and price are four important competitive factors in the steel market. During the 1970's the steel industries in Brazil, Korea, Mexico, and Taiwan began to acquire new production facilities that used modern technology. The purpose of building new capacity was primarily to achieve self-sufficiency in steel. Imports from these countries did not begin to increase appreciably until 1982. That year a worldwide depression occurred, and steel firms in these countries found that exporting was the only alternative to depressed domestic demand. In an effort to maintain employment and production levels and earn the much-needed foreign exchange to pay loans used to build steel plants, the countries exported steel in greater volumes. One of the significant markets for these exports was the United States, which, despite the recession, remained the world's largest market. Price became the major factor in competition, as dollar prices for steel dropped. With newer, modern facilities, these countries were able to produce qualities of steel that were acceptable to buyers in the United States. The combination of low prices and quality products proved successful for these countries. As a result, their combined import penetration ratio increased from 1.8 percent in 1981 to 4.6 percent in 1983.

International markets

The major markets for steel over the past three decades have been in Europe (East and West), and North America (table 101). The share of these areas has declined over time, however, reflecting increased consumption in Asian markets and in Latin America. On a country basis, the largest markets in recent years have been the U.S.S.R., the United States, and Japan. Two other country markets, West Germany and the People's Republic of China, have also been large steel-consuming countries. ^{1/}

^{1/} International Iron and Steel Institute, Steel Statistical Yearbook, 1982.

Table 101.--Steel: Apparent world consumption, 1/ by regions, 1955-82

Region	1955	1960	1965	1970	1978	1982 <u>2/</u>
	-----1,000 short tons-----					
Western Europe--:	80,468	106,603	126,952	174,185	146,075	135,500
Eastern Europe--:	63,911	96,716	129,752	167,373	234,094	221,800
North America---:	118,387	105,027	153,109	151,643	176,334	104,800
Latin America---:	7,727	9,623	13,746	20,139	36,418	35,600
Africa-----:	4,233	4,828	7,584	9,987	14,998	16,400
Middle East-----:	1,885	2,524	3,803	5,489	17,004	17,100
Asia-----:	17,681	50,430	61,310	118,045	156,804	167,500
Oceania-----:	3,869	5,093	7,407	8,245	6,696	7,000
Total-----:	298,161	380,845	503,663	655,108	788,413	705,700

1/ Crude steel equivalent.2/ Estimated.

Source: Organization for Economic Cooperation and Development (OECD), and International Iron & Steel Institute (IISI).

In terms of the volume of steel traded, exports, as a percent of world steel production, have increased over the past three decades from 10-15 percent during the 1950's to 15-20 percent in the 1960's and to 20-25 percent in the 1970's. The share of U.S. steel exports in the world total fell from an average of about 14 percent in the 1950's to less than 2 percent during 1977-81. As indicated in table 102, during the past decade Brazil, Korea, Mexico, and Taiwan have not held large shares of the world export market. Their growth has occurred since 1980. Korea was the largest exporting country profiled in terms of world share.

Table 102.--Steel: Average share of the quantity world steel exports for Brazil, Korea, Mexico, Taiwan, and the United States, specified years 1972-82

Year	Brazil	Korea	Mexico	Taiwan	United States
1972-----:	0.3	0.4	0.3	0.5	2.3
1975-----:	0.1	0.8	0.1	0.2	2.5
1978-----:	0.7	1.2	<u>1/</u>	0.7	1.7
1980-----:	1.4	3.3	0.1	0.6	2.7
1982-----:	1.8	4.5	0.2	1.4	1.3

1/ Less than 0.05 percent.

Source: IISI, Steel Statistical Yearbook, 1982.

U.S. exports

U.S. exports have accounted for 3 to 4 percent of domestic steel industry shipments over the past three decades. The value of exports rose from \$477 million in 1963 to \$2.6 billion in 1981, or by 538 percent (table). Canada has traditionally been the largest foreign market, with Mexico rising in importance in recent years.

During the 1950's and the first half of the 1960's, U.S. exports were assisted substantially by a Government program managed by the U.S. Agency for International Development (AID). Under the program, U.S. foreign aid to developing countries was given to encourage structural development in these countries. Although the importance of AID in steel exports has diminished since the mid-1960's, the program continues to be a factor in U.S. export sales.

Industry sources indicate that about one-third of steel exports can be characterized as "continuity" sales, whereby foreign companies with U.S. ties or U.S. ownership purchase steel for their foreign plants. The balance is more on the line of opportunistic sales. In 1969-70, for example, U.S. producers exported significant quantities of semifinished steel to Europe and other areas because of shortages. Also, in the 1960's and 1970's, certain domestic producers were suppliers of steel used in the construction of Mexican railroads. The strength of the dollar in 1981 and 1982 was probably an important factor in exports falling 55 percent from that of their 1980 level (table 103).

Table 103.--Steel mill products: U.S., Brazil, Korea, Mexico, and Taiwan exports, specified years 1972 to 1982

(1,000 short tons)					
Year	United States	Brazil	Korea	Mexico	Taiwan
1972-----:	2,955 :	366 :	472 :	454 :	607
1975-----:	3,114 :	164 :	1,026 :	74 :	274
1978-----:	2,535 :	1,032 :	1,789 :	405 :	985
1979-----:	2,921 :	1,636 :	3,462 :	278 :	1,675
1980-----:	4,148 :	2,176 :	4,989 :	74 :	850
1981-----:	2,956 :	2,067 :	5,214 :	46 :	1,317
1982-----:	1,870 :	2,597 :	6,542 :	336 :	2,094

Source: United Nations, and IISI Steel Statistical Yearbook, 1982.

Selected country exports

Combined steel exports from the four countries profiled did not account for a significant share of the world's steel export market until 1982, when they reached nearly 8 percent. From the early 1970's to the early 1980's, the composition of these countries' exports gradually shifted from lower valued steel products, such as bars, structural steel, and ingots, to higher valued products, such as plates, pipe and tube, and sheet and strip. Throughout the

1970's both Japan and the EC countries accounted for a large share of the world's steel exports. Since 1980, Brazil and Korea and, since 1982, Mexico and Taiwan have participated more actively in the steel export market, cutting into market shares held by both the EC and Japan.

Korea.--Of the countries profiled, Korea is the largest steel exporter, and in 1982 it represented a 4.5-percent tonnage share of the world steel export market compared with a 0.4-percent share in 1972 (table 102). The ratio of exports to production rose from 1.8 percent in 1967 to an average of 26 percent in the 1970's and reached 43 percent during 1981-82. ^{1/} By 1982, Korea's steel exports had reached 6.5 million short tons, making Korea the sixth largest steel-exporting country in the world.

Korea's largest firm exports about 35 percent of its production, with Japan usually its largest customer. About 5 percent of its exports goes to the United States. The smaller nonintegrated firms export about 33 percent of their output to the United States; that output largely consists of pipe and tube. In 1983, total steel exports from Korea to world markets were distributed in the following manner: ^{2/}

<u>Country</u>	<u>Percent</u>
United States-----	29
Japan-----	25
South East Asia-----	18
Middle East-----	17
EEC-----	1
Other-----	10
Total	100

The value of Korea's steel exports totaled \$2,345 million in 1982, of which exports to the United States totaled \$449 million. The Korean Government, in several recent studies, has projected that steel exports are likely to decline as steel consumption in Korea increases through 1991. These future trends are attributed to major government projects requiring steel and the continued growth in the Korean economy.

Taiwan.--Taiwan has not been a major exporter of steel products. As a percentage of world steel exports during the past decade, Taiwan's share grew from only 0.2 percent in 1975 to 1.4 percent in 1982. However, since the start up of the government steel mill, exports have increased as a percentage of production. But increased local demand is expected to bring about a decrease in exports in the near future. Already some spot shortages of steel products has forced the government to limit its facilities' exports in order to supply domestic industries. In 1983, Taiwan shipped about 70 percent of its exports to Japan and Korea, about 10 percent to the United States, and the remainder to Southeast Asian countries.

^{1/} Korea Development Bank Report, vol. 8, No. 5, May 1984.

^{2/} The Economist, Mar. 10, 1984, and Department of State airgram, A-30, June 23, 1983.

Brazil.--In 1982 Brazil exported \$725 million of steel products, which consisted largely of hot-rolled sheets, plates, and bars. The United States was Brazil's largest export market in 1982, purchasing 26.4 percent or \$191.1 million of their iron and steel exports. Brazil's second largest market was Argentina, which accounted for 7.2 percent of their steel exports. ^{1/} Brazil's share of the world steel export market is relatively small, accounting for 1.8 percent of the 1982 total (table 102).

Mexico.--Mexico's steel industry faced a myriad of problems in 1982 as the effects of the global recession began to spread throughout the economy. Though production declined from 1981 levels, Mexico's steel exports increased, rising from 46,000 short tons to 336,000 tons in 1982. The increase in exports can be attributed to the need to develop new markets and the devaluations of the peso, making Mexican steel cheaper to purchase. The increase reversed a 3-year trend in which exports declined from 405,000 tons in 1978 to 46,000 tons in 1981. Of the countries profiled, Mexico is the smallest exporter. In terms of the world steel export market, Mexican imports declined during the past decade, decreasing from 0.3 percent in 1972 to 0.2 percent in 1982.

Conditions of competition in international markets

The U.S. steel industry does not compete on a large scale with other steel-producing countries in international markets. The U.S. steel industry has been required to modernize its facilities in order to more effectively compete with imports in U.S. markets. In addition, the central location of most steel plants in the United States (constructed to supply domestic demand in the major consuming regions) increases the difficulty of transporting products to most foreign markets, and high labor costs make it hard for U.S. steel products to compete in international markets on a price basis. Another factor preventing U.S. producers from becoming more price competitive is the current high value of the U.S. dollar relative to foreign currencies; this makes U.S. steel products less competitive in world markets.

The success of Brazil, Korea, Mexico, and Taiwan in the world market has occurred for a number of reasons. First, the steel plants in these countries are newer and incorporate the latest technology, which has increased productivity, efficiency, and quality. In addition, most of the plants have been built at coastal port or other strategic locations that facilitate international shipping and reduce transportation costs to foreign markets. Second, the steel industries in each of these countries enjoy a labor cost advantage over many other international producers. For example, current wage differentials between the United States and these countries are still far apart and remain a significant factor enabling foreign steel firms to produce steel at a lower cost per ton (table 104). Third, export incentives and government investments, direct and indirect, have aided in the competitive development of these industries.

^{1/} Department of State airgram, A-22, Sept. 8, 1983.

Table 104.--Steel: Hourly compensation costs, in U.S. dollars, for production workers in iron and steel manufacturing, in selected countries, 1978-82

Country	1978	1979	1980	1981	1982 <u>1/</u>
Brazil-----	2.12	2.21	2.17	2.74	3.15
Korea-----	<u>2/</u> 1.35	<u>2/</u> 1.67	1.60	1.76	1.84
Mexico-----	2.48	2.99	3.73	4.54	2.37
Taiwan-----	<u>2/</u> 0.80	<u>2/</u> 1.01	<u>2/</u> 1.27	<u>2/</u> 1.52	<u>2/</u> 1.57
United States-----	13.56	15.15	17.46	19.04	22.74

1/ Preliminary estimates.

2/ Data are for iron and steel, including foundries.

Source: U.S. Department of Labor, Bureau of Labor Statistics, Office of Productivity and Technology, "Hourly Compensation Costs for Production Workers in Iron and Steel Manufacturing, 22 Countries, 1975-1983," unpublished data, January 1984.

Telecommunications Apparatus

Description and uses 1/

In the United States the manufacturers of "telecommunications apparatus" 2/ comprise a number of separate, distinct, and nonhomogeneous industries. The industries which comprise the telecommunications group include: 3/

- o Telephone and telegraph apparatus,
- o Commercial radio and television apparatus; radar, navigation search, and detection apparatus, and
- o Consumer audio, radio, and television apparatus.

Telephone and telegraph apparatus, (SIC No. 3661).--The telephone and telegraph apparatus covered in this heading are those electrical and electronic products used to transmit, route, and receive information principally by wire. 4/

Radio and TV communications equipment, (SIC No. 3662).--This group of industries principally produces commercial and military electronics products. The major industrial subheadings under SIC No. 3662 are--

- o Communications systems and equipment, (except broadcast) including microwave and mobile communication equipment,
- o Broadcast, studio, and related electronic equipment,
- o Intercommunication equipment, alarm systems, and traffic control equipment,
- o Search and detection, and navigation and guidance systems and equipment, and
- o Electronic systems and equipment, n.e.c.

1/ For a more detailed discussion of specific items covered see the first or second phase report (USITC Publication Nos. 1437 and 1517, respectively) on foreign industrial targeting and its effects on U.S. industries, published in October 1983, and April 1984, respectively.

2/ Group 724, Standard International Trade Classification, Revised.

3/ Not included in telecommunications, SITC group 724, are the industries which produce computers, calculators, and other automatic data processing machines, the industry producing magnetic tape recorders and tape players, or the industry producing components such as resistors, capacitors, wire, coils, or semiconductor products.

4/ The distinction between wire transmission and radio transmission apparatus is sometimes imprecise, since electronic apparatus can be used for either wire or radio transmission or reception.

Alarm systems, components, and traffic control apparatus are not included in SITC No. 724, and will not be included in the following analysis.

Radio and TV receiving sets, SIC No. 3651.--This group of industries generally produces consumer electronics products. In addition to radio and TV receivers, SIC No. 3651 includes consumer high-fidelity components, including audio and video recorders and players (not included in SITC No. 724), stereo compact systems, tuners, amplifiers, receivers, TV chassis and other home-type audio equipment, as well as speakers, including loudspeaker systems and loudspeakers sold separately, microphones, home-type electronic kits, and commercial sound equipment.

U.S. industry profile

Telephone and telegraph industry.--The telephone and telegraph apparatus manufacturing industry has existed since the invention of the telephone in the 1880's. The industry is very concentrated; the two largest manufacturers are owned by the two largest operating companies.

Until recently the phone system in the United States was a privately owned, legally franchised monopoly. Recently, there has been a Government-directed shift from publicly regulated monopoly to a deregulated, competitive market. In the manufacturing and supplying industry, the four largest U.S. firms have an estimated 85 percent concentration ratio. With the deregulation of the terminal equipment market and the divestiture of the large telephone operating companies there has been a significant increase in imports and in the number of U.S. suppliers of telephone and telegraph apparatus. Now that the divestiture is completed, the largest U.S. manufacturer is no longer prohibited from selling on the open market.

It is estimated that the number of establishments supplying telephone and telegraph apparatus has increased from 90 in 1963 to 270 in 1981. Although the largest manufacturer is closing down and consolidating inefficient, older plants because of the competitive market place, new companies are being established to supply new and innovative products to the deregulated market.

Persons employed in the manufacture of telephone and telegraph apparatus include the most highly skilled engineers and scientists in the world. The manufacturing segment of the industry employs moderately to highly skilled workers with a diminishing use of unskilled labor. In the manufacture of telephone and telegraph products, there is some large volume production such as the telephone instrument. Employment is estimated to have risen only moderately from 90,000 persons in 1963 to 148,000 in 1981, or 2.8 percent per year. In 1982, employment is estimated to have declined to 130,000 persons. The efficient use of new manufacturing processes and automation have kept quality high, cost low, and contributed to the moderate increase in employment.

Radio and TV communication industry.--It is estimated that the number of establishments producing commercial electronics products in the United States has increased from 1,100 in 1963 to 2,300 in 1981. The size of the firms engaged vary from multinational conglomerates to the smallest firm producing specialty parts.

Employment is estimated to have increased from 385,000 persons in 1963 to 425,000 in 1981. Data for 1982 indicate a slight decline to 420,000 persons. Skill levels range from scientific and engineering graduate degrees to the moderately skilled technician level. There is little use of unskilled labor in these industries. The products produced are technically complex and are produced in low volume (when compared with consumer electronic products).

Radio and TV receiving sets industry.--These products are purchased for consumption by the general population or consumer. Included are consumer high-fidelity apparatus and audio components, e.g., loudspeakers, radios (clock and regular), automobile radios, radio-phonograph-tape recorder-TV combinations, TV receivers (monochrome and color), and special parts of all of the foregoing. Not included are such products as video and audio tape recorders, since these products are not included in the definition of telecommunications, SITC No. 724.

Prior to and just after World War II, the U.S. radio manufacturers formed a viable and healthy industry. In 1954, there were 84 establishments engaged in the manufacture of radios, of which 53 were specialized at more than 90 percent.

Although television was invented in the United States and tested before World War II, it was not until after the war that final standards were set and commercial, revenue operation commenced. In 1954, there were 59 establishments engaged in the manufacture of TV receivers with 36 of these specialized at more than 90 percent. No dominant producer has emerged, although two U.S. firms have achieved for 20 to 25 percent each of the U.S. market for many years.

Of the 15 U.S.-owned firms manufacturing television receivers in the United States in 1971, 5 remain under U.S. ownership (two of these are a very small regional manufacturer and a private label manufacturer); 3 were bought by Dutch interests; 5 have gone out of business; and 2 were bought by Japanese firms. In addition, 6 Japanese firms, 2 Taiwan firms, and 1 Korean firm have established TV final assembly operations in the United States. Only one foreign firm (Japanese) established and operates a picture tube manufacturing plant in the United States.

The remaining industries which make up this sector of the overall telecommunication heading are those which make audio high-fidelity products and loudspeakers. As with radio receivers, there was a viable U.S. industry in high-fidelity products until the invention of the transistor. Today, there are no known producers of consumer audio amplifiers, although there are a few manufacturers of commercial grade and special effects amplifiers and apparatus.

Employment is estimated to have decreased from 81,300 persons in 1963 to 43,600 in 1982, after having peaked at 116,700 in 1967. The skill level required for the production of consumer electronic products range from semiskilled to skilled.

To the extent that any loss of domestic and/or international market share results from targeting practices, the corresponding absence of each \$1 million in production not undertaken by U.S. telecommunication apparatus manufacturers would translate into an estimated 101 workers displaced in all sectors of the U.S. economy (based on 1982 production/employment relationships), according to

the staff of the U.S. International Trade Commission, using the BLS input-output model, as seen in the following tabulation:

Industry sector	Displaced employment
	<u>Number</u>
Telecommunications-----	40
Other manufacturing-----	30
All other-----	31
Total-----	101

Foreign industry profile

Brazil, Canada, Korea, Mexico, and Taiwan, do not belong to the same economic unit or economic region. Mexico and Canada are North American countries and natural (though not the largest) U.S. trading partners for telecommunications products. Korea and Taiwan are members of the Far Eastern economic region, along with Japan, Singapore, Hong Kong, the Philippines, and Malaysia all of which trade heavily with the United States in electronic products. The industrial policies and government structure of each of these major trading partners varies widely from one another and the United States. Taiwan and Korea have the potential for very large trade surpluses with the United States. 1/ These two countries have developed strong infra-structures not only in the general economic sense but also in the manufacture of the electronic bit and piece parts necessary for the design, manufacture, and assembly of moderately advanced electronics products. Only in the area of the most advanced semiconductor products, such as integrated circuits, are these countries dependent on imports from U.S. and Japanese firms. Furthermore, Korea is now engaged in a serious attempt to obtain and install place advanced semiconductor design and manufacturing capability. These two countries are discussed in more detail in the following paragraphs. 2/

1/ Taiwan in 1982 had a trade surplus with the United States of over \$1 billion in telecommunications products; Korea, over \$200 million. The Korean surplus might have been larger were it not for a major upgrading of the Korean telephone and telecommunication system which is dependent upon U.S.-made equipment exported to Korea.

2/ The shipment data shown for these countries, however, do not include the full range of telecommunications products covered by SITC Group 724 and are therefore understated when compared with import and export data shown in appendix B.

Taiwan.--For the past 10 years, Taiwan has been a major supplier of consumer electronics to the United States. Recently, computers, peripherals, and telephone terminal apparatus have begun to be manufactured in Taiwan. Most recently, AT&T announced plans to set up a plant to manufacture their five ESS electronic central office switch in Taiwan. The plant would supply principally the needs of Taiwan, but some export capacity would be available.

Complete data on telecommunications product shipments are not available. However, three of the most important Taiwan-made products are telephone switching equipment, telephone sets, and intercom apparatus. The estimated shipments of these products are shown in the following tabulation (in thousands of dollars):

Item	1978	1979	1980	1981	1982
Wire-type telephone apparatus-----	13,377	142,886	212,658	186,426	336,063

Increased production of telephone sets, most of which were exported, accounted for the surge in 1982 shipments.

Korea.--For the past 10 years Korea has been a major U.S. supplier of consumer electronic products. Recently products such as color television receivers, video tape recorders, and telephone and telegraph terminal equipment have become major Korean export products. Estimated data on Korean production of telecommunications apparatus, are shown in the following for 1980-82 (in thousands of dollars):

Item	1980	1981	1982
Telecommunication apparatus-----	2,027,511	2,487,360	2,498,089

U.S. market

Until recently, the U.S. market for telephone and telegraph apparatus was restricted to telephone and telegraph operating companies. All other apparatus such as switching and transmission is housed in facilities owned by the operating company. In a short period of time customer premises equipment has gone from a closed operating company market to an open consumer market. Although this new market is immature, imports have already made significant penetration. Even the largest of U.S. producers are purchasing imports for their own private label.

Telephone and telegraph switching and transmission equipment primarily is supplied by U.S. manufacturers, particularly by those which are currently the captive suppliers of the operating companies.

The diversity of the products covered under radio and TV communication equipment reflects a diversity of markets. These markets have one thing in common--they are, with few exceptions, commercial markets. For instance, radio navigational aid and radar apparatus are sold to the commercial aviation and military markets. A second market segment is for the retrofit of new equipment to extend the life of older airplanes. A third segment would be for surface-mounted equipment used in ships and airports. These markets rise and fall with the aerospace industry and military budgets.

Communications markets are relatively mature. Commercial radio and television broadcasters are a typical market for studio equipment of all types. Land mobile radio equipment is sold to police and fire departments, utilities, delivery and taxi services, and to the general public. (The new cellular, land mobile, frequency reuse, two-way, radio telephone systems are expected to create a large commercial market.) In addition, a market segment has developed for cable television apparatus. This market was principally a rural one 25 years ago. Recently, most of the growth has taken place in suburban and urban areas. This market was relatively small until the urban growth. It is now attracting foreign competitors.

The markets for radio, TV receivers, and high-fidelity audio apparatus are mature consumer markets. It is estimated that over 50 percent of the TV market is for replacements, although there is a strong second-set market. In radios, the cheaper portables and table-top models are now disposable, in that the cost of repair usually is far in excess of the replacement cost.

U.S. shipments

The data in the following three tabulations are based on the official statistics of the U.S. Department of Commerce. The deflation index used is for manufactured goods and is based on the year 1972. The total value of telecommunications product shipments is shown in the following tabulation (in millions of dollars):

Item	: 1963	: 1967	: 1972	: 1977	: 1981	: 1982
Shipments-----	9,327	12,856	15,479	24,728	43,110	49,609
Shipments adjusted for :	:	:	:	:	:	:
inflation (1972)-----	11,278	14,771	15,479	17,600	21,924	24,078
	:	:	:	:	:	:

Total telecommunications shipments increased from approximately \$9.3 billion in 1963 to \$49.6 billion in 1982. Using the constant 1972 dollar value of shipments, output of all of the industries included in the telecommunications sector increased 2.1 times between 1963 and 1982. The compound annual growth rate based on the constant dollar value of shipments was 4.8 percent per year.

U.S. imports

The value of U.S. imports of telecommunications products increased eighty-eightfold during the period 1963-82, as shown in appendix table B-1. During the same period, the value of imports of telecommunications products from the "other major" trading partners increased roughly seventyfold.

Import penetration from all countries and from the "other major" trading partners.--The U.S import penetration ratio for telecommunications products from all countries has increased consistently from 0.9 percent in 1963 to 12.7 percent in 1982, as derived from appendix table B-63. Most of the increase in import penetration can be attributed to consumer imports principally from Japan and the Far East (including Korea and Taiwan). Import penetration from the "other major" trading partners aggregated increased from 1/2 percent in 1963 to 6.8 percent in 1979, before declining to 5.5 percent in 1982. Imports for Taiwan and Korea accounted from 57 percent of the aggregate value in 1982, as shown in the following tabulation (in thousands of dollars): 1/

Country	:	1963	:	1967	:	1972	:	1977	:	1981	:	1982
Imports from--	:	:	:	:	:	:	:	:	:	:	:	:
Brazil-----	:	0	:	1	:	1,830	:	79,098	:	62,551	:	52,211
Canada-----	:	40,663	:	74,766	:	92,965	:	165,272	:	377,039	:	390,752
Korea-----	:	22	:	1,273	:	13,673	:	189,468	:	505,493	:	521,788
Mexico-----	:	137	:	1,197	:	105,197	:	267,936	:	758,067	:	798,471
Taiwan-----	:	465	:	18,525	:	267,195	:	546,274	:	1,128,747	:	1,143,293
Total----	:	41,287	:	95,762	:	480,860	:	1,248,048	:	2,831,897	:	2,906,525
	:	:	:	:	:	:	:	:	:	:	:	:

Imports from Mexico are believed to include a very large share of U.S. components exported to the Mexican border free trade zone (maquiladora operations) for assembly, and returned to the United States.

Balance of trade.--The balance of trade in telecommunications products between the United States and the "other major" trading partners is shown in the following tabulation (in thousands of dollars): 2/

1/ The table presents import data reported to United Nations by the United States. The data shown in the appendices are based on exports as reported by the "other major" trading partners. Differences in the reporting of exports by one country and imports by the receiving country can be significant.

2/ The balance of trade is based on export and import data provided by the United States to the United Nations.

Country	1963	1967	1972	1977	1981	1982
Balance with--:						
Brazil-----:	3,386	5,177	24,219	7,972	14,221	19,101
Canada-----:	6,802	17,662	90,666	128,355	46,079	-2,268
Korea-----:	916	4,854	-6,128	-121,543	-369,335	-218,348
Mexico-----:	5,238	12,075	-26,132	-101,021	-395,830	-523,216
Taiwan-----:	1,119	-8,484	-209,649	-478,817	-995,795	-1,020,646
Total----	17,461	31,284	-127,024	-565,054	-1,700,660	-1,745,377

Since 1972, the U.S. balance of trade in telecommunication apparatus has declined at an annual rate of 19 percent per year, until it stood at a deficit of approximately \$8 billion in 1982. Only in the case of Brazil has the United States maintained a trade surplus, albeit small. Over the period from 1963 to 1982, the performance of Korea and Taiwan have been spectacular. Since 1962, imports from Taiwan have increased at an annual rate of 51 percent per year; although, in the most recent period, from 1977 to 1982, the rate of increase has been only 16 percent per year. Korea has taken great strides in exporting to the United States. Between 1963 and 1982 imports from Korea have increased at a phenomenal rate of 70 percent per year. From 1977 to 1982, Korean imports rose at the rate of 22.5 percent per year.

Conditions of competition in the U.S. market

Competition in the U.S. market is predicated on vigorous antitrust and anticartel enforcement, and strong consumer advocacy. The United States is the world leader in all facets of electronics technology and the production thereof. The finest research laboratories in the world, which are privately owned and operated, exist in the United States. Most of the recent electronic technological progress rests on the invention in a private U.S. research laboratory, funded by the private sector, of the transistor and subsequent solid-state electronics technology.

International markets

Telephone and telegraph apparatus markets.--As noted in the section on the "U.S. Industry," except for the United States, telephone and telegraph systems are Government owned and operated. This results are essentially closed markets for the hardware used by the operating companies. The operating companies, if they do not own the producers, have established long-term relationships with their local suppliers. U.S. firms which supply foreign countries with telephone and telegraph products have usually done so from subsidiaries within the procuring country. Establishment of close relationships with embryonic postal telephone administrations is important to long-term supply contracts. Telephone systems in general must have long-term

logistic support and a fixed set of design criteria and specifications in order to make logistic support economical. That is, all parts of the system must be integrated and designed to work reliably over long periods of time with all other parts of the system. Thus, initial suppliers have the opportunity to use the learning curve over long-term contracts.

Terminal equipment is more easily designed to interface with the telephone systems than other types of telephone equipment such as central office switching equipment. Terminal equipment by its very nature is hung on the ends of the network, not integrated into the network. Therefore, there is a more open global market for terminal equipment than for transmission and switching equipment. The United States is currently negotiating with other countries to deregulate or open up their markets for such equipment in order to increase the flow of trade.

The United States has two natural markets for telephone and telegraph products--Canada and Mexico. English-speaking countries such as the United Kingdom and Australia are also in the top 10 U.S. export markets. In addition, countries which are engaged in massive expansion and upgrading of their telephone and wire telecommunications systems are also good markets for the U.S. manufacturers. Two examples of such countries are Korea and Saudi Arabia.

Radio and TV communications markets.--The variety of the products which comprise this group of commercial electronics products and systems do not allow a single description of market structure. For instance about one-third of U.S. exports of commercial electronics systems and components are of navigational aids (navaids), radar, and radio remote control apparatus. The United States is a worldwide supplier of aviation electronics (avionics) apparatus; the EC is also a strong supplier. Japan, not yet having a strong aviation or defense industry, does not seem to be a major source for avionics or navaids except for specific isolated instances, such as, small boat radars for commercial fishing vessels, yachts, and pleasure boats.

In commercial communications products Japan is gaining a worldwide reputation. In areas such as satellite earth stations and cellular, land-mobile systems Japanese firms are well known. For commercial television and studio apparatus, both Japan and the EC countries are very competitive.

Radio and TV receiving set markets.--Once certain technical standards have been established, it becomes difficult if not impossible to make major technical changes in the market. For instance, Japan and the United States use a fully compatible set of TV transmission standards. Europe uses several different standards which are not compatible with those used in the United States and Japan. It is unlikely due to the huge consumer investment in television receivers (not to mention the commercial investment in broadcast equipment) that the United States or Japan will ever adopt the European transmission system or vice versa.

Therefore, worldwide markets for consumer radios and TV receivers tend to be technically segregated. However, there are no technical reasons why consumer products cannot be produced to foreign specifications and standards and sold outside of the producing country.

Japan has the largest worldwide market share in consumer electronics products. The Japanese are willing to produce equipment to any set of technical specifications. According to Japanese statistics, Europe is the largest purchaser of consumer electronics produced in Japan; the United States a close second, and all of Asia a close third.

U.S. exports

In 1963, the United States exported \$529 million of telecommunications products, and \$3.6 billion in 1982. The compound annual growth rate over the period of 19 years was 10.6 percent per year. In the most recent period, 1977-82, the compound annual growth rate was 10.9 percent per year. Considering that there was an 11-percent decline in the value of exports, when comparing the value of exports in 1967 with that in 1963, the low 19-year growth rate is not unexpected. The U.S. export ratio, defined as the value of exports of telecommunications products divided by the value of shipments, has shown some improvement in the past 19 years. This ratio was lowest at 3.7 percent in 1967 and highest at 8.6 percent in 1977. In 1982, the export ratio was down slightly to 7.2 percent.

Canada remains the largest market for U.S. manufactured telecommunications apparatus with Taiwan replacing Mexico as the second largest market during the most recent period (table B-51). The 1982 declines in exports to Mexico, Canada, Taiwan, and Germany are believed to have been caused by the recent worldwide recession. Between 1981 and 1982, however, U.S. exports to Korea more than doubled.

With the exception of Brazil, in 1982 U.S. exports of telecommunications apparatus exceeded \$100 million to each of the other major trading partners, as shown in the following tabulation below (in thousands of dollars):

Country	1963	1967	1972	1977	1981	1982
U.S. exports to--						
Brazil-----	3,386	5,178	26,049	87,070	76,772	71,322
Canada-----	47,465	92,428	183,631	293,627	423,118	388,784
Korea-----	938	6,127	7,545	67,925	136,158	303,440
Mexico-----	5,375	13,272	79,065	166,915	362,237	275,255
Taiwan-----	1,584	10,041	57,546	67,457	132,952	122,647
Total-----	58,748	127,046	353,836	682,994	1,131,237	1,161,448

During 1963-82, U.S. exports to these trading partners have grown at an annual rate of 17 percent per year.

Selected country exports

The United States and West Germany are the largest markets for telecommunications apparatus exports from the "other major" trading partners (tables B-52 through B-56). For several of these trading partners, the United States represents the single largest market and is 5 to 10 times larger than the next largest market. For instance, Brazilian exports of telecommunications products to the United States since the middle 1970's have amounted to \$80 to \$90 million per year. The products exported have been for the most part finished and unfinished television receivers, automobile radio receivers, portable radio receivers, phonographs and stereo high-fidelity equipment. These products are produced in Brazil by subsidiaries of U.S. companies.

Conditions of competition in international markets

Many U.S. producers have established manufacturing facilities in countries which encumber foreign access to their markets but permit foreign investment in manufacturing facilities for domestic production. In some countries, however, U.S.-owned producers are required to export a share, often large, of their production.

In recent years, developing countries have emulated certain developed countries, demanding a specified amount of domestic content in products sold in their markets. Some markets are closed to imported U.S. products with local manufacturers serving only the local market. However, in developing countries lacking an established production base, foreign manufacturers find market access easier. The major markets for U.S. producers of telecommunications apparatus among developed countries, excluding the United States, are Canada and the Economic Community. Among the developing countries, the major markets are Korea, Mexico, and Taiwan.

The principal strength of U.S. producers of telecommunications equipment in international markets is their technological edge. U.S. manufacturers are unquestionably superior to foreign producers in the designing, manufacturing, and installation of most telecommunications products.

Textiles

Description and uses

The raw materials used in the manufacture of textiles are primarily fibers, either natural or manmade. The most popular textile fibers used are cotton and manmade fibers (such as polyester, nylon, acrylic, rayon, and acetate); wool, silk, and other vegetable fibers maintain a very small but important share of consumption. In 1982, the U.S. textile industry consumed 11.1 billion pounds of fiber, including 3.2 billion pounds of polyester, 2.5 billion pounds of cotton, and 1.9 billion pounds of nylon. 1/

Fibers can be processed directly into fabrics but are usually manufactured into yarns which are subsequently made into textile mill products (primarily fabrics). The term "textiles" includes the products classified in Standard Industrial Classification Code 22 and covers yarn, 2/ cordage, thread, fabric (including some finished products manufactured in fabric mills), fabricated knit apparel, floor coverings, and various miscellaneous products, such as felt and lace goods, paddings, waste, and filling.

Textile fabrics are formed by several methods, including weaving, knitting, braiding, crocheting, felting, bonding, and laminating. Weaving accounts for the largest amount of textile fabric; knitting is second, much of which becomes a finished apparel product, such as hosiery and underwear.

The apparel industry is the leading consumer of textile products. In the United States, about 40 percent of the textile output is consumed in the production of apparel. Other important markets for textile products include homefurnishings (sheets, blankets, drapes, and so forth) and industrial products such as tires, dryer felts, filter bags, rubber reinforcement, motor-vehicle interiors, nets, cordage, geotextiles, 3/ and medical and surgical products.

U.S. industry profile

The United States is the world's leading textile producer, with shipments totaling almost \$50 billion in 1982. 4/ The number of U.S. textile mills

1/ In 1983, these figures were 12.1 billion pounds, 3.4 billion pounds, 2.8 billion pounds, and 2.3 billion pounds, respectively.

2/ Substantial quantities of the yarns used in textile manufacture are made by manmade-fiber producers and need no further processing before being used in the production of fabric. Such yarns are in continuous (unbroken) form and are considered raw materials.

3/ Geotextiles are fabrics which are permeable and are used on or below the surface of the earth as soil stabilizers or components of an engineered structure.

4/ Shipments were \$52 billion in 1983.

totals more than 5,000, about two-thirds of which employ less than 100 workers each. These mills are primarily located in the Southeast, especially in the Carolinas and Georgia.

The distribution of textiles is complex. Manmade fibers and continuous filament yarns are obtained from the manmade-fiber producer; cotton and wool are obtained through brokers, merchants, and cooperatives as well as directly from producers. Most fiber is manufactured into yarn by integrated textile mills, and specialized yarn spinners. However, a substantial amount is distributed directly to product manufacturers, that use the fiber largely as filling. Manufactured yarns are sent to fabric mills, or directly to product manufacturers, particularly those engaged in producing knit apparel. Most fabric is sold in finished form to end users by the textile mill that produces it. However, some yarn and fabric are handled by intermediaries (textile wholesalers) which arrange for yarn or fabric to be manufactured on contract. Finally, there are yarn and fabric processors which dye, finish, print, embroider, coat, or laminate textile products before they are sold to product manufacturers.

Prior to the 1960's, small firms employing less than 200 workers accounted for most U.S. textile production. However, during the 1960's and the 1970's, large firms employing over 1,000 workers accounted for more than one-half of textile production. This shift was the result of several factors. The newer and more efficient textile equipment which delivered larger production loads became more expensive and required higher capital outlays. Thus, only large firms could justify major investments in newer equipment. The search for higher profit margins caused many firms, which produced yarn or fabric exclusively, to integrate vertically, and/or horizontally. Therefore firms grew larger, either through acquisition or by establishing new production facilities, to enable them to make a greater variety of textile products; diversification enabled them to cope with the fluctuating demand of one or a few textile products. Other factors, such as dependable supplies of raw materials, wider distribution of market outlets, and production in larger and more economical operating units, also contributed to the concentration of production in fewer firms. By the 1980's, the largest 50 firms in textiles accounted for 50 percent of the industry's total output; the largest 15 firms, for roughly 35 percent. 1/

New plant and equipment expenditures by U.S. textile producers increased during 1967-82. Such expenditures were \$0.7 billion in 1967, \$1.1 billion in 1972, and \$1.3 billion in 1977 and 1982. Profits in the textile industry have traditionally been below the average for all manufacturing industries; since 1967, they have averaged annually under 3 percent of sales, whereas net profits for all manufacturing industries have averaged annually around 5 percent of sales. Net profits in the textile industry totaled about \$700 million in 1967 and 1972, \$800 million in 1977, and \$900 million in 1982. 2/

Average employment in the textile industry has declined since 1967. In 1967, the industry employed 957,000 workers; in 1972, 986,000 workers (representing an increase of 3 percent); in 1977, 910,000 workers (representing a decline of almost 8 percent); and in 1982, 750,000 workers

1/ American Textile Manufacturers Institute, Washington, DC

2/ In 1983, net profits in the textile industry were \$1.6 billion.

(representing a decline of 20 percent). The decline since the 1970's was caused chiefly by increased productivity, increased imports, and stagnant domestic demand. Although the annual output per worker increased from \$20,700 in 1967 to \$62,900 in 1982, real output as measured by the Federal Reserve Board's Industrial Production Index increased by 33 percent during 1967-76, and declined by 6 percent during 1976-82, to produce an overall net increase of 25 percent during 1967-82. In 1967, textile employees worked an average of 40.9 hours a week and received \$2.60 per hour; in 1972, the average was 41.3 hours per week and \$2.74 per hour; in 1977, 40.4 hours and \$3.99 per hour; and in 1982, 37.4 hours and \$5.83 per hour. ^{1/} In 1967, labor accounted for an estimated 51 percent of the value of U.S. textile shipments, but in 1982, labor accounted for less than 39 percent of this value.

To the extent that any loss of domestic and/or international market share results from targeting practices, the corresponding absence of each \$1 million in production not undertaken by U.S. textile manufacturers would translate into an estimated 41 workers displaced in all sectors of the U.S. economy (based on 1982 production/employment relationships), according to the staff of the U.S. International Trade Commission, using the BLS input-output model, as seen in the following tabulation:

Industry sector	Displaced employment
	<u>Number</u>
Textile-----	21
Other manufacturing-----	8
All other-----	<u>12</u>
Total-----	41

Foreign industry profile

Brazil.--Production data is not available for overall Brazilian shipments of textiles. However, domestic fibers consumption, most of which enters into some form of textiles, is considered an indirect measurement of textile shipments. Estimated production of textiles in Brazil increased steadily between 1970 and 1980, with consumption of fiber increasing from 570,000 tons in 1970 to 1,161,000 tons in 1980. In 1981, fiber consumption declined to 1,044,000 tons, but increased modestly to 1,070,000 tons in 1982. ^{2/} Based on fiber consumption, the Brazilian textile industry's output was approximately one-fifth that of the U.S. industry in 1982.

Presently, it is estimated that the industry is operating at 80 percent of capacity due to declines in domestic demand and exports. The industry was

^{1/} In 1983, textile employees worked an average of 40.4 hours a week and received \$6.18 per hour.

^{2/} Consumption declined to 1,028,000 tons in 1983.

also affected by a shortage of cotton and the resulting sharp rise in raw cotton prices owing to a poor crop. A large portion of the Brazilian industry was hampered by lack of capital to modernize and maintain competitiveness both domestically and in export markets. 1/

Much of the output of Brazil's textile industry is used to produce apparel for domestic consumption. A smaller share is used to produce home-furnishings and for industrial purposes. In recent years, 22 to 30 percent of Brazilian textiles has been exported in the form of yarn, fabric, apparel, or other textile products.

Approximately 4,000 firms produce textiles in Brazil. Many of these firms are small, and the bulk of textile production is done by the 300 largest firms. The Brazilian textile industry has 140,000 looms and 4.4 million spindles. However, much of the equipment used by the industry is old and does not require highly skilled workers. The industry employs approximately 350,000 workers.

Korea.--Production indices indicate that the Korean textile industry increased its output fivefold from 1970 to 1982. In 1982, the industry produced 1.3 million tons of yarn--approximately 60 percent was of manmade fibers, 37 percent was of cotton, and the remainder was predominantly wool. The industry also produced 2.7 billion square yards of fabric--76 percent of this production was of manmade fibers, 21 percent was of cotton, and the remainder was chiefly of wool and silk.

As the result of a 5-year industry modernization program (1981-86) sponsored by the Government, the industry plans to modernize and further increase its capacity. The plan includes increasing the number of spindles from 4.5 million to 5.6 million. 2/ It also calls for increasing the number of looms from 301,000 to 395,000, and it includes the acquisition of additional dyeing and finishing equipment to upgrade the quality and quantity of the fabrics produced. This plan could increase Korea's global share of textile production from 3 percent to 5 percent. 3/

From 1976 to 1982, the production capacity of Korea's textile industry increased 59 percent. During the same period, the production index rose 74 percent. However, as the industry has been undergoing a modernization program, the difference between these figures cannot be wholly related to increased capacity utilization. It does indicate a greater efficiency of the expanded capacity.

Much of the output of the Korean textile industry is used to produce apparel, primarily for export, but exports of yarn and fabric are also important, together accounting for 42 percent of Korea's textile/apparel exports in 1980. Much of the export trade is handled by the manufacturers themselves, as the large firms are also general trading companies.

1/ Telegram from U.S. Embassy, Brazilia, Feb. 24, 1984, p. 3.

2/ Japan Textiles News, July 1981, p. 15.

3/ Ibid.

The 4,000 firms in the Korean textile industry range from small, specialized mills with 20 or fewer workers to large, integrated mills with as many as 10,000 workers and producing not only yarn and fabric but also apparel. The bulk of production is accounted for by large firms. Employment in the industry is approximately 360,000 workers. The modernization plan is expected to increase employment and permit higher wage rates to attract more highly skilled workers, which the Korean textile industry has had difficulty attracting from higher wage industries such as electronics.

Taiwan.—Production of Taiwan's textile industry has been stagnant in recent years. Cotton yarn, both wholly of cotton and blends, accounted for approximately 60 percent of spun yarn production, 38 percent of manmade-fiber yarn, 2 percent of wool yarn. Approximately 75 percent of fabric production was cotton, 24 percent of manmade fibers, and 1 percent of wool. In 1982, the industry utilized 4 million spindles and 75,000 looms; in 1976, it utilized 3.4 million spindles and 63,000.

The Government of Taiwan established a 10-year textile development plan, covering 1980-89, aimed at developing the industry as a major exporter. The plan calls for modernizing the industry, balancing production among the various sectors of the industry (including apparel production), and improving management and marketing methods. 1/ It is expected that modernization will not only improve the quality and competitiveness of the industry but also increase production, including that of apparel, from 781,000 to 1,019,700 tons.

Though some of Taiwan's textile industry production is consumed internally, the prime focus of the industry is the export market, either directly in the form of textiles or as apparel. A substantial share of yarn production is sold to domestic producers of sweaters and other knit apparel.

In 1981, Taiwan had 1,175 textile firms, many of which were small with low-capital investment. (One of the objectives of the 10-year plan is to consolidate small and medium firms into large ones.) The textile industry is concentrated in three export processing zones where the apparel industry is also located.

Taiwan's textile industry employed 290,000 workers in 1981. Since 1978, the industry has employed approximately 16 percent of all manufacturing labor. Female workers, primarily young, unmarried women, account for about 70 percent of the textile work force. The industry has a high turnover rate and, as a result, has a low proportion of experienced, highly trained workers. An objective of the 10-year plan is to improve training for workers at all levels and, if feasible, employ a higher proportion of men and married women to reduce the turnover rate and increase the skill level of workers. 2/

U.S. market

During 1967-82, U.S. consumption of textiles increased 50 percent from \$20.1 billion in 1967 to \$30.4 billion in 1977, and continued to increase annually until it reached \$50.0 billion in 1981. Then in 1982, a stagnant market reduced consumption to \$47.2 million. 3/

1/ "Ten-year Plan," Industry of Free China, June 1981.

2/ Ibid.

3/ In 1983, consumption increased to \$53.3 billion.

Factors of demand for textiles in the United States are price, consumer need, fashion, comfort, and new or improved industrial and household applications. In the area of fashion, designers play an important role in the textile industry, one that has been increasing in recent years especially in developed countries. In the area of improved industrial applications, new uses include geotextiles, portable liquid storage tanks, inflatable convention and stadium coverings, heat-resistant products for space exploration, net-enclosing breeding pens for sea fish, and snow chains for automobiles. Lastly, new or improved household applications include disposable diapers, wiping cloths, reusable bags, abrasive cloths, and temporary storage closets.

U.S. shipments

Quantity data are not available for overall U.S. shipments of textiles. However, domestic fiber consumption, almost all of which enters into some form of textiles, is considered an indirect measurement of textile shipments. These data, along with the value of textile shipments, are shown, for selected years, in the following tabulation: 1/

	<u>Domestic consumption</u> <u>of fibers 1/</u> <u>(million pounds)</u>	<u>Value of textile</u> <u>shipments 2/</u> <u>(million dollars)</u>
1967-----	9,365	19,797
1972-----	12,318	28,064
1977-----	12,729	40,551
1982-----	11,140	47,217

1/ Textile Organon, a publication of the Textile Economics Bureau, Inc., March 1983, p. 38.

2/ U.S. Department of Commerce, Bureau of the Census.

From 1967 to the middle 1970's, the quantity of domestic textile shipments increased. Afterwards, in the late 1970's and the early 1980's, the quantity of shipments gradually declined, principally due to sluggish demand for apparel and homefurnishings and increased imports of apparel, which further limited opportunities for domestic textile shipments. In contrast, from 1967 to the early 1980's, the value of shipments rose. The increase in the 1970's can be attributed in part to real growth in U.S. textile consumption. However, the increase in the late 1970's and early 1980's is largely the result of inflation and the production of more expensive textile products.

1/ In 1983, domestic consumption of fibers totaled 12,554 million pounds and value of textile shipments was \$52,208 million.

U.S. imports

In terms of value, U.S. imports of textiles increased from \$0.8 billion in 1967 to \$1.5 billion in 1972, and to \$1.8 billion in 1977, and to \$2.8 billion in 1982. ^{1/} Though quantity data are not available for overall textile imports, imports of cotton, wool, and manmade fibers, which account for a preponderant share of all textile imports, totaled an estimated 4.0 billion equivalent square yards in 1972, 2.5 billion equivalent square yards in 1977, and 2.6 billion equivalent square yards in 1982. ^{2/} The quantity of textile imports, as measured in equivalent square yards, of cotton, wool, and manmade fibers, has trended irregularly lower since 1972. The major cause of the lower imports has been the sharp drop in imported manmade-fiber yarns. During this period, the domestic users of textile yarns have generally shifted to U.S.-produced yarns which became abundant and competitively priced as larger and more cost-efficient U.S. plants were established. In addition, the institution of the Multifiber Arrangement for textile products of manmade fibers in the early 1970's contributed to the reduced imports. In the years after 1972, imports of textiles have typically accounted for between 4 and 6 percent of domestic consumption.

Although Japan is currently the largest exporter of textiles to the United States, Brazil, the Republic of Korea, and Taiwan are important and growing suppliers. They accounted for 9 percent of U.S. imports in 1977 but expanded their share to 15 percent in 1982. Imports from these countries increased from \$156 million in 1977 to \$426 million in 1982. U.S. imports of textiles from Brazil rose from \$56 million in 1977 to \$80 million in 1982; they increased in every year since 1977 except in 1982 when they dropped 13 percent from the previous year's amount (\$92 million). U.S. imports from Korea quadrupled during 1977-82; they were \$43 million in 1977 and \$168 million in 1982. Lastly, imports from Taiwan tripled, rising from \$57 million in 1977 to \$177 million in 1982; they also increased in every year during 1977-82, except in 1982 when they dropped approximately 12 percent from the previous year's amount (\$199 million). ^{3/}

Conditions of competition in the U.S. market

Textiles imported from Brazil, Korea, and Taiwan generally compete in the U.S. market on the basis of their competitive prices. Some textiles from these countries, such as agricultural twine from Brazil and artificial flowers of manmade fibers from Taiwan, have little or no domestic competition in the U.S. market. By far the largest portion of the U.S. market comprises basic textiles (yarns, cordage, fabrics, homefurnishings, and so forth) where price

^{1/} Imports of textiles in 1983 totaled \$3.5 billion.

^{2/} Square yard equivalents of imports of textiles are an overall measure of trade in physical terms. Textiles, except fabrics which are measured in actual square yards, are assigned a conversion factor which converts other physical units (such as pounds of yarn) into square yard equivalents.

^{3/} In 1983, imports from Brazil reached \$107 million; from Korea, \$228 million; and from Taiwan, \$224 million for a total of \$560 million, or about 16 percent of all U.S. textile imports. These figures include fibers, which account for less than 5 percent of the combined imports for all three countries.

plays a major role in purchasing decisions. Although U.S. firms' textiles are priced competitively, Brazil, Korea, and Taiwan have gradually captured increasing shares of the U.S. textile market in the last decade with certain products. For example, Brazil is an important supplier of cotton yarn; Korea supplies large quantities of continuous filament manmade-fiber fabrics; and Taiwan is a large supplier of cotton fabric.

International markets

Data on world consumption of textiles are not available. However, the approximate size of the world's largest markets can be measured by the total amount of textile fibers consumed. According to the Food and Agriculture Organization of the United Nations, ^{1/} the United States is the world's largest consumer of textile fibers, ^{2/} consuming approximately 10.6 billion pounds in 1980. In that year, the European Community was the second largest market, consuming 9.5 billion pounds; Union of Soviet Socialist Republics (U.S.S.R.) was the third largest market, consuming about 9.0 billion pounds; the People's Republic of China (China) was the fourth largest market, consuming about 8.9 billion pounds; and Japan was the fifth largest market, consuming almost 4.2 billion pounds. Within the European Community, the leading textile markets in 1980 were West Germany, which consumed 3.1 billion pounds of textile fibers; France and the United Kingdom, which each consumed 1.7 billion pounds; and Italy, which consumed 1.6 billion.

Price and the lack of a domestically produced product are the principal determinants of demand for textile products throughout the world. However, particular policies and situations frequently influence the demand for products and the source from which countries obtain products in the various major markets. For example, member countries within the EC dominate trade in textiles due to the absence of tariff and trade barriers among the member states and due to their geographical proximity to one another. In the case of Japan, the shift by Japanese textile manufacturers to higher quality, specialized yarn and fabric has lead to an increase in foreign supply of coarser, lower quality textile products. China, Korea, and Pakistan have been especially successful in selling these lower quality products in the Japanese market. Finally, a prime factor influencing demand for textiles in the "Big Three" nations is their ability, or lack of it, to domestically produce enough yarn and fabric to meet their local needs, particularly the needs related to their apparel industries' export programs.

In general, from 1963-72, the U.S. textile industry out performed the combined industries of Brazil, Korea, and Taiwan, in terms of providing textile products to world market (app. table B-62). However, by 1977, Brazil, Korea, and Taiwan exported more, as a group, than did the United States. ^{3/}

^{1/} World apparel fibre consumption survey, 1983.

^{2/} Cotton, wool, flax, and manmade fibers.

^{3/} Data for more recent years are not available due to reporting problems in certain countries.

U.S. exports

U.S. textile exports rose from \$531 million in 1967 to \$2.0 billion in 1977. Since 1977, exports continued to grow annually until 1981, reaching \$3.6 billion. However, stagnating demand and the strong U.S. dollar produced a decline in 1982 of 22 percent in the value of exports (\$2.8 billion). ^{1/}

In the 1960's and the 1970's, the most important export markets for U.S. textile producers were Canada, the United Kingdom, Australia, and Belgium. In the 1980's, Mexico, Saudi Arabia, China, and Japan emerged as important U.S. markets. Canada remained the leading U.S. market in 1982 (\$501 million); and the United Kingdom was second (\$161 million); Saudi Arabia, third (\$156 million); China, fourth (\$128 million); Mexico, fifth (\$106 million); and Japan was sixth (\$101 million).

Selected country exports

Brazil.--Exports of textiles from Brazil rose from \$3.8 million in 1963 to \$522.7 million in 1982 (table B-59). Though the United States was an important market throughout the period, its share declined from 42 percent in 1969 to 14 percent in 1982. Overall, the EC, primarily Germany, Italy, and France, has been Brazil's major market. Other significant markets were Canada, Nigeria, and Japan. Cotton yarn and fabric and agricultural twine are Brazil's major textile export items.

The Republic of Korea.--In 1963, 47 percent of Korea's textile exports of \$7.8 million went to the United States (table B-60). By 1972, Korea's exports increased to \$176.5 million, and Japan and Hong Kong became important markets, respectively accounting for 25 and 15 percent of the total. The United States' share of Korean exports declined to 14 percent in 1972. Japan and Hong Kong continued to be the leading markets, taking 17 percent each through 1981, when Korea's textile exports amounted to \$2.4 billion. Korea's exports to the U.S. market that year were \$192 million, or 8 percent of the total. Fabric of continuous manmade fiber yarn has become Korea's leading textile export item, accounting for 30 percent of the total. Cotton yarn and fabric and manmade-fiber yarn are other leading export items.

Taiwan.--Since 1963, Hong Kong has been Taiwan's primary textile export market. In that year, Taiwan's exports to Hong Kong amounted to \$11.0 million, or 28 percent of the total of \$28.7 million (table B-61). The United States was the second largest market, accounting for \$2.4 million, or 6 percent. In 1981, Taiwan's textile exports were \$1.8 billion, of which 33 percent, valued at \$585.9 million, went to Hong Kong. The second largest market was Japan (9 percent), followed by Singapore (7 percent), Nigeria (5 percent), and the United States (5 percent). Woven fabric of manmade fibers, of both filament and spun yarn, is the leading export item. Also of significance are exports of manmade-fiber yarn and cotton fabric.

^{1/} From 1982 to 1983 there was a further decline of 15 percent in the value of U.S. textile exports to \$2.4 billion.

Conditions of competition in international markets

Because of the great variety of articles comprised by international trade in textiles, competitive factors are many and varied. For the less sophisticated items such as grey yarn or fabrics of basic constructions, price is a prime factor. For countries such as Brazil, with abundant supplies of cotton, these basic items are important export items, whereas Korea and Taiwan, which must import cotton, tend to export more sophisticated, higher valued items such as manmade-fiber fabric and dyed or finished cotton fabric.

Trade patterns indicate that transportation costs are a factor of competition. The large amount of intra-EC textile trade and trade among the Asian nations indicated the influence of transportations costs, with major trading partners being near each other. Transportation costs for textile shipped to the United States from abroad range from approximately 3 to 15 percent of the value of the goods. Transportations costs to the United States for fabric from France are approximately 7 percent of the value of the goods, which is approximately 50 percent greater than transportation costs of comparable items from Canada. From Korea the costs are 50 percent greater than for fabric from France. However, though transportation costs increase the cost of goods from distant sources, they are not sufficient to hinder trade when offset by other factors.

In some instances quotas are a factor, limiting the extent to which a specific country can export specific items to another country. Within these quota limitations, it is generally believed that factors such as price, style, and quality are of significant importance. Quotas also influence the quality of imports. If a country's exports are limited by quota, it frequently chooses to export higher valued goods.

APPENDIX A

U.S. INTERNATIONAL TRADE COMMISSION

NOTICE CONCERNING PHASE 3 OF INVESTIGATION NO. 332-162

review an initial determination (I.D.) granting complainant Qume Corporation's (Qume's) motion to withdraw its complaint with respect to respondents C. Itoh & Co., Ltd. (C. Itoh), and C. Itoh Electronics, Inc. (CIE), because the conditions which formed the basis for naming those firms as respondents no longer exist. This action has the effect of terminating the investigation as to C. Itoh and CIE.

SUPPLEMENTARY INFORMATION: No petitions for review or agency or public comments were received.

Copies of all nonconfidential documents filed in connection with this investigation are available for inspection during official business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary, U.S. International Trade Commission, 701 E Street N.W., Washington, D.C. 20436, telephone 202-523-0161.

FOR FURTHER INFORMATION CONTACT: Jane Albrecht, Esq., Office of the General Counsel, U.S. International Trade Commission, telephone 202-523-1693.

Authority: 19 U.S.C. 1337, 47 FR 25134, June 10, 1982, and 48 FR 20225, May 5, 1983 (to be codified at 19 CFR 210.53(c) and (h)).

Issued: May 30, 1984.

By order of the Commission.

Kenneth R. Mason,
Secretary.

(FR Doc. 84-15217 Filed 6-5-84; 8:45 am)
BILLING CODE 7020-02-M

[Investigation No. 337-TA-174]

Certain Woodworking Machines; Commission Determination Not to Review Initial Determination Substituting Complainants

AGENCY: International Trade Commission.

ACTION: The Commission has determined not to review an initial determination ("ID") granting complainant's motion to amend the complaint and notice of investigation.

SUPPLEMENTARY INFORMATION: On April 16, 1984, complainant Rockwell International Corp. ("Rockwell") filed a motion to amend the complaint and notice of investigation (Motion No. 174-23) to substitute Delta International Machinery Corporation for the present complainant Rockwell.

On May 9, 1984, the presiding officer issued an ID granting the Rockwell motion (Order No. 16). The Commission received no petitions for review of the ID or comments from any government agency.

FOR FURTHER INFORMATION CONTACT: Hannekore V. M. Hasl, Esq., Office of the General Counsel, telephone 202-523-0375

Authority: 19 U.S.C. 1337; 19 CFR 210.53 (c) and (h).

Issued: May 31, 1984.

By order of the Commission.

Kenneth R. Mason,
Secretary.

(FR Doc. 84-15218 Filed 6-5-84; 8:45 am)
BILLING CODE 7020-02-M

[332-162]

Import Investigations; Foreign Industrial Targeting and Its Effects on U.S. Industries; Phase III, Brazil, Canada, Korea, Mexico, and Taiwan

AGENCY: International Trade Commission.

ACTION: This notice announces the start of the third phase of the Commission's investigation of foreign industrial targeting, investigation 332-162, and informs the public of the schedule of that phase, including the scheduling of a public hearing.

EFFECTIVE DATE: May 24, 1984.

FOR FURTHER INFORMATION CONTACT: Dr. John Suomela, Director, Office of Economics (202) 523-3771 or Paul Golding (202) 523-1542.

SUPPLEMENTARY INFORMATION: The Commission instituted the present investigation on its own motion under section 332(b) of the Tariff Act of 1930 (19 U.S.C. 1332(b)) on April 19, 1983, at the request of the Subcommittee on Trade of the House Committee on Ways and Means. Notice of institution of the investigation and the schedule of the first phase of the investigation which concerned industrial targeting by Japan was published in the Federal Register of May 11, 1983 (48 FR 21210). Notice of institution of the investigation and the schedule of the second phase of the investigation which concerned industrial targeting by the European Community and member states was published in the Federal Register of October 26, 1983 (48 FR 49559).

In the original notice of investigation, it was announced that the investigation would be divided into three phases: the first to consider Japanese industrial targeting, the second to consider the European Community's industrial targeting, and the third to consider industrial targeting by other major U.S. trading partners—Brazil, Canada, Korea, Mexico, and Taiwan.

Phase III will attempt to answer the following questions about the specific

countries' industrial targeting: (1) Which industries have these countries targeted? (2) What specific practices have these countries used to further the international competitiveness of these industries? (3) What have been effects of these practices on the competitiveness of the countries and their U.S. competitors?

The report of phase III findings will be submitted to the Subcommittee on Trade no later than January 9, 1985.

Public Hearing

A public hearing in connection with the third phase of this investigation will be held in the Commission Hearing Room, 701 E Street N.W., Washington, D.C., 20436, beginning at 10 a.m. on September 11, 1984. All persons shall have the right to appear by counsel or in person, to present information, and to be heard. Requests to appear at the public hearing should be filed with the Secretary, United States International Trade Commission, 701 E Street N.W., Washington, D.C. 20436, no later than noon, September 4, 1984.

Written Submissions

In lieu of or in addition to appearances at the public hearing, interested persons are invited to submit written statements concerning the investigation by September 4, 1984. Commercial or financial information, which a submitter desires the Commission to treat as confidential must be submitted on separate sheets of paper, each clearly marked "Confidential Business Information" at the top. All submissions requesting confidential treatment must conform with the requirements of § 201.6 of the Commission's *Rules of Practice and Procedure* (19 CFR 201.6). All written submissions, except of confidential business information, will be made available for inspection by interested persons. To be ensured of consideration by the Commission, written statements should be submitted at the earliest possible date, but no later than October 10, 1984. All submissions should be addressed to the Secretary at the Commission's office in Washington, D.C.

Issued: May 29, 1984.

By order of the Commission.

Kenneth R. Mason,
Secretary.

(FR Doc. 84-15215 Filed 6-5-84; 8:45 am)
BILLING CODE 7020-02-M

APPENDIX B
STATISTICAL TABLES

Table B-1.--Aircraft and aerospace: U.S. exports, by principal markets, and by specified years 1963-82

Market	1963	1967	1972	1977	1981	1982
(In thousands of dollars)						
Not disclosed 1/	840,115	305,077	406,885	1,186,023	1,711,841	2,388,010
Japan	29,913	70,575	402,354	220,791	1,301,357	888,378
West Germany	9,808	135,438	222,721	280,239	1,038,626	774,734
Canada	40,672	169,753	193,890	200,990	959,446	616,230
United Kingdom	15,013	49,705	214,285	368,915	744,827	472,604
Saudi Arabia	10,472	9,789	37,627	272,315	678,933	324,538
France	20,694	58,010	151,353	214,230	674,561	469,283
Switzerland	10,499	30,707	44,604	88,816	278,663	258,152
All other	117,401	689,426	1,245,689	3,033,458	7,223,746	5,453,807
Total	1,084,216	1,518,480	2,919,408	5,865,777	14,612,000	11,645,736

1/ Because of the confidentiality of military aerospace sales, names of specific markets for such exports are not available.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table B-2.--Aircraft and aerospace: Canadian exports, by principal markets, and by specified years 1963-82

Market	1963	1967	1972	1977	1981	1982
(In thousands of dollars)						
United States	55,810	181,951	261,279	195,089	756,790	806,589
United Kingdom	1,280	1,240	5,523	8,047	33,378	32,223
Cameroon	-	-	200	161	19,362	19,533
Denmark	1	133	188	221	14,490	8,684
France	1,226	710	5,080	2,942	14,163	22,286
Ethiopia	1	4	89	1,060	13,587	2,167
Israel	-	2	32	352	13,055	7,132
Norway	12	780	956	1,501	12,872	2,747
All other	25,378	35,329	125,513	93,969	153,699	325,384
Total	83,708	220,149	398,860	303,342	1,031,396	1,226,745

Source: Compiled from official statistics of the United Nations.

Table B-3.--Aircraft and aerospace: Brazilian exports, by principal markets, and by specified years 1963-82

Market	(In thousands of dollars)					
	1963	1967	1972	1977	1981	1982
United States-----	-	5,366	722	411	71,323	48,459
Colombia-----	-	-	-	-	11,900	4,895
France-----	-	-	-	-	6,963	19,166
Ecuador-----	-	113	-	-	3,750	-
Paraguay-----	-	-	-	-	3,615	2,759
Gabon-----	-	-	-	-	3,408	2,015
Mexico-----	-	-	-	-	2,825	74
Australia-----	-	-	-	-	1,932	2,323
All other-----	3,412	1	26	15,809	21,448	38,415
Total-----	3,412	5,480	748	16,220	127,164	118,106

Source: Compiled from official statistics of the United Nations.

Table B-4.--Aircraft and aerospace: U.S. and selected countries' 1/ exports to world markets, by specified years, 1963-82

Year	(In thousands of dollars)	
	U.S. exports	Selected countries' exports
1963-----	-	-
1967-----	1,084,216	87,120
1972-----	1,518,480	225,629
1977-----	2,919,408	399,608
1981-----	5,865,777	319,562
1982-----	14,612,000	1,158,560
	11,638,000	1,344,851

1/ Brazil and Canada.

Source: Compiled from official statistics of the U.S. Department of Commerce, and United Nations data.

Note.--Quantity data are not available.

Table B-5.--Apparel: Exports from Brazil, by principal markets, and by specified years, 1963-82

(In thousands of dollars)						
Market	1963	1967	1972	1977	1981	1982
West Germany-----	-	1	3,678	16,953	21,598	17,746
United States-----	21	169	9,936	21,850	16,182	17,157
Paraguay-----	20	94	3,661	16,512	13,926	8,337
United Kingdom-----	-	-	107	1,996	5,392	5,252
Venezuela-----	-	6	211	1,250	2,894	4,586
Chile-----	-	-	25	889	10,057	4,373
Netherlands-----	-	-	3,035	2,633	2,520	3,772
Sweden-----	-	-	47	1,079	3,817	3,508
All other-----	32	125	8,825	22,010	35,370	20,322
Total-----	73	395	29,525	85,172	111,756	85,053

Source: Compiled from official statistics of the United Nations.

Table B-6.--Apparel: Korean exports, by principal markets, and by specified years, 1963-82 ^{1/}

Market	(In thousands of dollars)				
	1963	1967	1972	1977	1981
United States-----	4,196	33,638	237,645	820,707	1,323,766
Japan-----	113	9,979	77,389	356,974	591,594
West Germany-----	3	453	23,738	224,522	387,382
United Kingdom-----	15	1,167	7,459	95,024	219,345
Libya-----	0	6	1,112	4,440	170,261
Netherlands-----	121	1,147	20,373	81,229	137,277
Canada-----	85	2,907	29,375	104,185	136,480
France-----	0	115	2,925	26,274	71,252
All other-----	111	9,799	39,565	310,086	694,879
Total-----	4,644	59,205	439,581	2,023,441	3,732,236

^{1/} Data not available for 1982.

Source: Compiled from official statistics of the United Nations.

Table B-7.--Apparel: Mexican exports, by principal markets, and by specified years, 1963-82 1/

(In thousands of dollars)				
Market	1963	1967	1972	1977
United States-----	1,171	3,835	16,938	14,234
Sweden-----	1	1	14	237
Canada-----	52	118	280	3,100
West Germany-----	3	8	59	6,175
Belgium and Luxemburg----	1	2	970	1,550
United Kingdom-----	2	31	18	578
France-----	28	10	295	308
Netherlands-----	6	2	31	555
All other-----	513	248	446	3,493
Total-----	1,777	4,255	19,051	30,230

1/ Data not available for 1981 and 1982.

Source: Compiled from official statistics of the United Nations.

Table B-8.--Apparel: Taiwan exports, by principal markets, and by specified years, 1963-82 1/

(In thousands of dollars)				
Market	1963	1967	1972	1977
United States-----	6,059	27,877	292,562	714,780
West Germany-----	107	1,329	29,418	92,054
Japan-----	135	998	30,064	96,978
Panama Canal zone-----	-	-	4,150	51,056
Saudi Arabia-----	-	15	1,718	33,985
Canada-----	2,053	5,755	45,854	75,269
Kuwait-----	-	43	3,146	30,181
United Kingdom-----	3	514	20,054	37,118
All other-----	1,861	10,135	61,027	191,583
Total-----	10,218	46,686	487,993	1,323,004

1/ Data not available for 1981 and 1982.

Source: Compiled from official statistics of the United Nations.

Table B-9.--Apparel: U.S. exports, by principal markets, and by specified years, 1963-82

(In thousands of dollars)						
Market	1963	1967	1972	1977	1981	1982
Mexico-----	5,426	10,859	48,289	102,575	202,849	131,924
Dominican Republic-----	949	355	1,418	24,412	67,838	64,663
Canada-----	7,305	10,331	22,029	55,958	70,246	60,606
Japan-----	2,609	2,123	5 473	19,728	69,459	50,123
United Kingdom-----	2,510	2,653	3,128	30,549	89,264	47,891
Netherlands Antilles-----	6,088	9,134	10,952	26,966	44,387	44,923
Venezuela-----	1,572	1,647	5,998	21,153	39,824	38,239
Costa Rica-----	707	595	4,430	16,734	32,205	34,859
All other-----	62,667	88,588	108,263	262,084	512,911	393,139
Total-----	89,833	126,285	209,908	560,159	1,128,983	866,367

Source: Compiled from official statistics of the United Nations.

Table B-10.--Apparel: U.S. and selected countries' ^{1/} exports to world markets, by specified years, 1963-82

(In thousands of dollars)		
Year	U.S. exports	Selected countries' exports
1963-----	89,829	16,712
1967-----	126,285	110,541
1972-----	209,980	976,150
1977-----	560,159	3,461,847
1981-----	1,128,983	^{2/} 6,665,951
1982-----	846,548	^{2/} 6,198,784

^{1/} Brazil, Korea, Mexico, and Taiwan.

^{2/} Estimated by the staff of the U.S. International Trade Commission.

Source: Compiled from official statistics of the U.S. Department of Commerce and United Nations data, except as noted.

Note.--Quantity data are not available.

Table B-11.--Automatic data-processing machines: U.S. exports, by principal markets, and by specified years, 1972-82

(In thousands of dollars)				
Market	1972	1977	1981	1982
United Kingdom-----	42,313	115,976	705,336	831,008
Canada-----	141,278	213,942	634,574	674,956
West Germany-----	61,584	96,241	542,072	501,597
France-----	55,545	80,137	424,447	431,575
Japan-----	59,420	84,816	394,578	402,339
Australia-----	20,695	63,011	232,496	236,806
Netherlands-----	17,132	41,325	199,213	211,145
Italy-----	19,991	27,342	195,742	168,772
All other-----	157,278	334,785	1,752,620	1,849,626
Total-----	575,278	334,785	5,081,078	5,307,824

Source: Compiled from official statistics of the United Nations.

Table B-12.--Automatic data-processing machines: Brazilian exports, by principal markets, and by specified years, 1972-82

(In thousands of dollars)				
Market	1972	1977	1981	1982
Japan-----	2,469	31,713	56,504	51,697
Australia-----	18	5,319	21,822	9,091
Italy-----	201	2,051	20,147	18,888
Canada-----	0	2,272	16,632	3,251
Argentina-----	618	3,703	14,814	6,783
Mexico-----	1,592	4,516	13,849	3,943
Chile-----	0	683	7,452	2,057
Venezuela-----	543	3,233	7,589	12,545
All other-----	7,565	16,263	58,266	73,240
Total-----	13,006	69,753	217,075	181,445

Source: Compiled from official statistics of the United Nations.

Table B-13.--Automatic data-processing machines: Korean exports, by principal markets, and by specified years, 1972-82

(In thousands of dollars)

Market	1972	1977	1981
United States-----	1,145	9,157	27,019
Japan-----	234	4,179	8,184
West Germany-----	2	2,709	980
France-----	0	535	604
Denmark-----	0	65	257
Italy-----	0	174	249
United Kingdom-----	126	302	257
Canada-----	0	138	408
All other-----	435	1,103	1,007
Total-----	1,942	18,360	38,965

1/ Data not available for 1982.

Source: Compiled from official statistics of the United Nations.

Table B-14.--Automatic data processing machines: Mexican exports, by principal markets, and by specified years, 1972-82 1/

Market	1972	1977
United States-----	1,025	2,648
West Germany-----	183	1,340
Italy-----	-	448
Canada-----	-	418
Sweden-----	-	198
Netherlands-----	3,948	252
Switzerland-----	-	121
Belgium and Luxembourg-----	-	103
All other-----	388	549
Total-----	5,544	6,077

1/ Data not available for 1981 and 1982.

Source: Compiled from official statistics of the United Nations.

Table B-15.--Automatic data-processing machines; U.S. and selected countries' 1/ exports to world markets, by specified years, 1972-82

(In thousands of dollars)		
Year	U.S. exports	Selected countries' exports
1972-----	575,236	23,005
1977-----	1,057,575	139,701
1981-----	5,081,078	<u>2/</u> 256,040
1982-----	5,307,824	<u>3/</u>

1/ Brazil, Mexico, Taiwan, and Korea.

2/ Understated because data are not available from all countries.

3/ Data not available.

Source: Compiled from official statistics of the United Nations.

Note.--Quantity data are not available.

Table B-16.--Automobiles: U.S. ^{1/} exports, by principal markets, and by specified years, 1963-82

Market	(In thousands of dollars)							
	1963	1967	1972	1977	1981	1982		
Canada-----	28,306	563,042	1,076,642	2,762,048	3,167,567	2,349,393		
Saudi Arabia-----	3,695	5,427	3,781	110,818	176,511	153,362		
Kuwait-----	8,435	10,614	16,775	102,011	101,165	66,210		
Japan-----	8,846	8,593	24,508	90,028	48,917	45,546		
Venezuela-----	25,164	19,469	27,350	93,415	89,625	43,022		
West Germany-----	7,336	10,466	10,373	48,116	38,082	30,381		
United Arab Emirates-----	-	-	807	18,788	30,124	18,659		
Mexico-----	43,577	54,408	75,920	118,892	31,814	16,365		
All other-----	165,361	151,556	87,240	287,554	341,788	213,922		
Total-----	290,720	823,575	1,323,396	3,631,670	4,025,593	2,936,860		
^{1/} Includes Puerto Rico.								

Source: Compiled from official statistics of the United Nations.

Table B-17.--Automobiles: Brazilian exports, by principal markets, and by specified years, 1963-82

Market	(In thousands of dollars)							
	1963	1967	1972	1977	1981	1982		
Italy-----	-	-	-	99	137,133	223,417		
Venezuela-----	-	-	-	6,162	38,575	78,155		
Nigeria-----	-	-	-	35,661	83,750	61,406		
Peru-----	-	-	7,496	9,497	25,887	19,438		
Colombia-----	-	-	9	130	13,331	19,369		
Chile-----	-	-	92	10,861	90,942	11,303		
Uruguay-----	15	13	231	4,540	61,672	10,877		
France-----	-	-	-	-	2,500	8,537		
All other-----	107	262	1,535	14,835	91,587	27,063		
Total-----	122	275	9,363	81,785	545,377	459,565		

Source: Compiled from official statistics of the United Nations.

Table B-18.--Automobiles: Canadian exports, by principal markets, and by specified years, 1963-82

Market	(In thousands of dollars)						
	1963 1/	1967	1972	1977	1981	1982	
United States 2/	813	761,558	2,138,385	3,720,754	4,211,052	5,754,867	
Saudi Arabia	928	1,054	1,250	23,951	146,642	104,699	
Kuwait	679	1,969	1,260	20,673	34,463	31,148	
United Arab Emirates	-	-	48	2,429	16,844	8,488	
Qatar	132	-	176	1,818	5,933	4,731	
Switzerland	9	525	705	1,965	1,274	2,942	
Netherlands	13	545	420	2,476	1,367	1,845	
West Germany	19	47	29	5,852	3,484	1,602	
All other	25,447	49,114	51,183	254,425	129,084	14,078	
Total	28,040	814,812	2,193,456	4,034,344	4,550,143	5,924,400	

^{1/} Data obtained from Statistics Canada.^{2/} Includes Puerto Rico.

Source: Compiled from official statistics of the United Nations, except as noted.

Table B-19.--Automobiles: Korean exports, by principal markets, and by specified years, 1963-82 1/

(In thousands of dollars)					
Market	1963	1967	1972	1977	1981
Libya-----	-	-	-	-	11,482
United Kingdom-----	-	-	-	13	6,273
Taiwan-----	-	-	10	202	4,735
Saudi Arabia-----	-	-	-	434	3,529
Egypt-----	-	-	-	107	2,140
Netherlands-----	-	-	-	106	2,074
Singapore-----	-	-	-	-	1,586
Peru-----	-	-	-	-	1,400
All other-----	61	160	77	13,677	36,378
Total-----	61	160	87	14,539	69,597

1/ Data not available for 1982.

Source: Compiled from official statistics of the United Nations.

Table B-20.--Automobiles: Mexican exports, by principal markets, and by specified years, 1963-82 1/

(In thousands of dollars)				
Market	1963	1967	1972	1977
West Germany-----	-	-	344	5
Ecuador-----	-	-	166	11
United Kingdom-----	-	-	3	-
United States <u>2/</u> -----	73	22	59	9
Cuba-----	-	-	72	4
Honduras-----	-	-	228	-
Guatemala-----	-	-	412	17
Colombia-----	-	-	28	-
All other-----	5	13	1,460	103
Total-----	78	35	2,772	149

1/ Data not available for 1981 and 1982.2/ Includes Puerto Rico.

Source: Compiled from official statistics of the United Nations.

Table B-21.--Automobiles: U.S. exports and selected countries' 1/ exports to world markets, and by specified years 1963-82.

(In thousands of U.S. dollars)		
Year	U.S. exports <u>2/</u>	Selected countries' exports
1963-----	290,720 :	28,301
1967-----	823,575 :	815,282
1972-----	1,323,396 :	2,205,678
1977-----	3,631,670 :	4,130,817
1981-----	4,025,593 :	<u>3/</u> 5,165,117
1982-----	2,936,860 :	<u>4/</u> 6,383,965

1/ Brazil, Canada, the Republic of Korea, and Mexico.

2/ Includes Puerto Rico.

3/ Excludes Mexico.

4/ Excludes Mexico and Korea.

Source: Compiled from official statistics of the United Nations and Statistics Canada.

Table B-22.--Crude petroleum: U.S. exports, by principal markets and by specified years, 1963-82

(In thousands of dollars)							
Market	1963	1967	1972	1977	1981	1982	
Canada-----	<u>1</u> /	12,099	4	209,567	576,623	468,867	
West Germany-----	<u>1</u> /	7,040	-	-	-	-	
United Kingdom-----	<u>1</u> /	56,392	-	-	-	-	
Japan-----	<u>1</u> /	1,393	552	-	-	-	
All other-----	<u>1</u> /	8,641	9	2	172	2	
Total-----	<u>1</u> /	85,565	565	209,569	576,795	468,870	

1/ Data not available.

Source: Compiled from official statistics of the United Nations.

Table B-23.--Crude petroleum: Canadian exports, by principal markets and by specified years 1963 to 1982

(In thousands of dollars)						
Market	1963	1967	1972	1977	1981	1982
United States-----	232,413	379,725	938,141	1,460,691	1,933,318	2,225,008
Total-----	232,413	379,725	938,141	1,460,691	1,933,318	2,225,008

Source: Compiled from official statistics of the United Nations.

Table B-24.---Crude petroleum: Mexican exports, by principal markets and by specified years, 1963-82

(In thousands of dollars)							
Market	1963	1967	1972	1977	1981	1982	
United States	13,527	19,168	1/	883,886	1/	1/	
Israel	-	-	1/	93,611	1/	1/	
All other	3	1	1/	11,891	1/	1/	
Total	13,530	19,169	1/	989,388	1/	1/	

1/ Data not available.

Source: Compiled from official statistics of the United Nations.

Table B-25.--Crude petroleum: U.S. and selected countries' 1/ exports to world markets, by specified years, 1963-82

(In thousands of dollars)			
Year	U.S. exports	Selected countries' exports	
1963-----	<u>2/</u>	245,943	
1967-----	85,565	398,894	
1972-----	565	938,141	
1977-----	209,569	2,450,079	
1981-----	576,795	<u>3/</u> 1,933,318	
1982-----	468,870	<u>3/</u> 2,225,008	

1/ Canada and Mexico.

2/ Not available.

3/ Data presented do not include Mexico.

Source: Compiled from official statistics of the U.S. Department of Commerce, and the United Nations data.

Note.--Quantity data are not available.

Table B-26.--Footwear: U.S. exports, by principal markets and by specified years 1963-82

Market	1963	1967	1972	1979	1981	1982
Japan-----	66	203	1,735	10,056	20,274	22,051
Canada-----	1,286	1,626	2,090	12,043	20,716	13,441
Italy-----	109	102	83	1,733	4,102	8,146
France-----	48	115	106	3,347	6,430	5,715
Mexico-----	1,285	1,159	1,150	3,796	8,378	5,247
Venezuela-----	22	62	145	3,238	4,514	4,605
Saudi Arabia-----	19	99	143	1,615	2,174	4,187
Netherlands Antilles--	911	626	407	2,403	3,212	3,177
All other-----	5,816	5,294	5,177	44,860	70,764	53,041
Total-----	9,562	9,266	11,036	83,091	140,564	119,580

Source: Compiled from official statistics of the United Nations.

Table B-27.--Footwear: Brazilian exports, by principal markets and by specified years, 1963-82

(In thousands of dollars)

Market	1963	1967	1972	1977	1981	1982
United States-----	114	267	47,438	118,061	389,808	375,853
United Kingdom-----	4	1	1,447	6,910	47,523	40,018
Canada-----	-	-	2,843	8,111	26,570	21,656
Australia-----	-	-	338	5,056	12,842	12,357
France-----	-	-	44	5,115	7,230	9,051
Paraguay-----	5	4	148	1,573	5,978	4,574
West Germany-----	-	-	654	8,780	7,933	4,215
Togo-----	-	-	-	-	5,067	2,490
All other-----	3	26	1,651	20,868	59,349	30,818
Total-----	126	298	54,563	174,474	562,300	501,032

Source: Compiled from official statistics of the United Nations.

Table B-28.--Footwear: Korean exports, by principal markets and by specified years, 1963-82 1/

(In thousands of dollars)

Market	1963	1967	1972	1977	1981
United States-----	675	7,289	40,996	302,244	561,619
Japan-----	1	103	3,323	62,329	99,395
United Kingdom-----	3	52	639	17,974	54,576
Canada-----	43	343	5,592	20,620	51,141
France-----	-	21	637	13,994	32,186
Panama-----	-	3	49	1,366	18,605
Sweden-----	-	2	866	8,683	18,119
Italy-----	-	-	45	4,161	16,994
All other-----	16	326	3,258	56,255	170,999
Total-----	738	8,139	55,405	487,626	1,023,634

1/ Data not available for 1982.

Source: Compiled from official statistics of the United Nations.

Table B-29.--Footwear: Taiwan exports, by principal markets and by specified years, 1963-82 1/

(In thousands of dollars)

Market	1963	1967	1972	1977	1981
United States-----	269	4,439	96,530	435,042	822,381
West Germany-----	-	67	7,737	31,133	110,942
Japan-----	8	42	6,373	24,075	67,812
France-----	-	12	1,867	7,719	31,067
Australia-----	10	155	4,334	23,207	45,763
Canada-----	298	1,909	14,908	19,153	44,495
Netherlands-----	7	31	3,126	8,351	33,054
United Kingdom-----	-	2	2,432	15,468	27,437
All other-----	102	1,337	17,014	52,043	229,503
Total-----	694	7,994	154,321	616,191	1,412,454

1/ Not available for 1982

Source: Compiled from official statistics of the United Nations.

Table B-30.--Footwear: U.S. and selected countries' 1/ exports to world markets, by specified years, 1963-82

(In thousands of dollars)

Year	U.S. exports	Selected countries' exports
1963-----	9,562	1,558
1967-----	9,266	16,431
1972-----	11,036	264,289
1977-----	41,565	<u>2/</u> 278,291
1981-----	140,564	<u>2/</u> 562,300
1982-----	119,579	<u>2/</u> 501,032

1/ Brazil, Korea, and Taiwan.

2/ Data for Brazil only; in 1977 Brazil accounted for 14 percent of exports from these 3 sources.

Source: Compiled from official statistics of the United Nations.

Table B-31.--Machine tools: 1/ U.S. exports, by principal markets and by specified years, 1963-82

Market	(In thousands of dollars)							
	1963	1967	1972	1977	1981	1982		
Mexico-----	7,685	13,231	17,802	42,018	261,331			139,601
Canada-----	22,960	48,311	43,198	61,081	255,230			81,972
United Kingdom-----	19,267	37,248	16,561	26,627	68,903			62,008
Japan-----	25,384	21,655	31,322	22,076	54,675			51,912
West Germany-----	14,175	8,188	10,368	23,708	35,387			22,641
France-----	11,359	14,300	12,213	10,799	30,293			19,767
Brazil-----	5,155	5,229	25,757	40,522	23,284			21,062
Australia-----	3,601	8,097	4,837	6,622	21,651			11,017
All other-----	85,191	79,968	97,944	218,617	292,961			240,801
Total-----	194,777	236,227	260,002	452,070	1,043,715			650,781
1/ Includes only machine tools for working metal.								

Source: Compiled from official statistics of the United Nations.

Table B-32.--Machine tools: 1/ Korean exports, by principal markets and by specified years 1963-82 2/

Market	1963	1967	1972	1977
United States-----	-	19	13	191
Japan-----	1	-	354	203
Saudi Arabia-----	-	-	-	244
Australia-----	-	2	-	3
Indonesia-----	-	-	2	86
West Germany-----	-	-	2	0
Canada-----	-	-	-	7
Libya-----	-	-	-	-
All other-----	1	165	2,774	1,003
Total-----	2	186	3,145	1,737

1/ Includes only machine tools for working metal.

2/ Data not available for 1982.

Source: Compiled from official statistics of the United Nations, except as noted.

Table B-33.--Machine tools: 1/ Taiwan exports, by principal markets and by specified years 1963-82

(In thousands of dollars)				
Market	1963	1967	1972	1977
United States-----	-	38	399	22,071
Thailand-----	12	403	1,663	8,224
Australia-----	-	12	129	2,791
Hong Kong-----	83	3	466	2,775
Indonesia-----	-	-	1,180	2,774
Malaysia-----	-	83	604	1,694
Philippines-----	76	355	682	1,657
Canada-----	-	4	146	1,578
All other-----	12	517	1,921	11,586
Total-----	183	1,415	7,190	55,150

1/ Includes only machine tools for working metal.2/ Data not available for 1981 and 1982.

Source: Compiled from official statistics of the United Nations, except as noted.

Table B-34.--Machine tools: 1/ U.S. exports and selected countries' 2/ exports from Korea and Taiwan, to world markets, specified years 1963 to 1982.

(In thousands of U.S. dollars)		
Year	U.S. exports	Selected countries' exports
1963-----	194,777	185
1967-----	236,227	1,601
1972-----	260,002	10,335
1977-----	452,070	56,887
1981-----	1,043,715	<u>3/</u> 223,279
1982-----	650,781	<u>3/</u> <u>4/</u> 162,023

1/ Includes only machine tools for working metal.2/ Korean and Taiwan.3/ Data for Taiwan from Taiwan's Machine Tools, U.S. Embassy report, dated November 1983.4/ Data for Korea from U.S. Department of State Telegram, U.S. Embassy, Seoul, Korea, Mar. 11, 1983.

Source: Compiled from official statistics of the United Nations, except as noted.

Note.--Quantity data are not available.

Table B-35.--Natural gas: U.S. exports, by principal markets,
and by specified years 1963-82

(In thousands of dollars)							
Market	1963	1967	1972	1977	1981	1982	
Japan-----	54	73	30,865	95,326	328,490	291,920	
Mexico-----	13,718	28,318	28,058	5,600	6,095	489	
All other-----	4,081	35,923	1,377	152	436	339	
Total-----	17,853	64,134	60,300	101,078	335,021	292,748	

Source: Compiled from official statistics of the United Nations.

Table B-36.--Natural gas: Canadian exports, by principal markets,
and by specified years, 1963-82

(In thousands of dollars)							
Market	1963	1967	1972	1977	1981	1982	
United States--	1/	145,305	214,544	1,898,003	3,401,002	3,665,902	
Total-----	1/	145,305	214,544	1,898,003	3,401,002	3,665,902	

1/ Not available.

Source: Compiled from official statistics of the United Nations.

Table B-37.--Natural gas: Mexican exports, by principal markets,
by the specified years, 1963-82

(In thousands of dollars)						
Market	1963	1967	1972	1977	1981	1982
United States-----	0	0	0	0	511,332	474,324
Total-----	0	0	0	0	511,332	474,324

Source: Compiled from official statistics of the United Nations.

Table B-38.--Natural gas: U.S. and selected countries' ^{1/} exports to
world markets, by specified years, 1963-82

(In thousands of dollars)		
Year	U.S. exports	Selected countries' exports
1963-----	17,853	^{2/}
1967-----	64,134	145,305
1972-----	60,300	214,544
1977-----	101,078	1,898,003
1981-----	335,021	3,912,334
1982-----	292,748	4,140,226

^{1/} These nations are Canada and Mexico.

^{2/} Not available.

Source: Compiled from official statistics of the U.S. Department of Commerce and United Nations data.

Note.--Quantity data are not available.

Table B-39.--Pharmaceuticals: Brazilian exports, by principal markets and by specified years, 1963-82

(In thousands of dollars)						
Market	1963	1967	1972	1977	1981	1982
West Germany-----	6	214	559	1,671	9,141	9,984
Argentina-----	179	251	160	255	4,464	9,567
United States-----	159	503	1,272	2,146	6,611	4,448
Venezuela-----	17	45	396	1,322	2,569	4,014
Panama-----	17	109	810	360	4,692	3,375
Mexico-----	183	59	1,075	2,499	5,501	3,211
Paraguay-----	34	19	89	712	2,816	2,787
Columbia-----	18	53	872	921	2,270	2,654
All other-----	328	1,219	1,443	5,707	18,565	17,735
Total-----	941	2,472	6,676	15,593	56,629	57,775

Source: Compiled from official statistics of the United Nations.

Table B-40.--Pharmaceuticals: Korean exports, by principal markets and by specified years, 1963-82 ^{1/}

(In thousands of dollars)					
Market	1963	1967	1972	1977	1981
Japan-----	1	8	1,632	4,684	7,650
Hong Kong-----	12	83	93	1,410	2,149
Pakistan-----	-	-	-	813	1,738
Mexico-----	-	-	-	-	1,544
United States-----	-	7	172	709	1,191
Italy-----	-	-	-	206	1,143
All other-----	40	51	1,897	3,469	10,754
Total-----	53	149	2,508	11,291	26,169

^{1/} Data for 1982 are not available.

Source: Compiled from official statistics of the United Nations.

Table B-41.--Pharmaceuticals: Mexican exports, by principal markets
and by specified years, 1963-82 1/

Market	1963	1967	1972	1977
United States-----	6,629	4,498	5,992	11,857
West Germany-----	2,008	3,724	4,201	8,097
Panama-----	4,280	4,162	3,031	3,605
El Salvador-----	274	667	735	1,885
Honduras-----	145	350	639	1,796
Guatemala-----	467	678	1,002	1,758
Belgium and Luxembourg---	-	78	625	1,717
Costa Rica-----	402	628	977	1,604
All other-----	3,638	7,453	9,997	15,952
Total-----	17,843	22,738	27,199	48,271

1/ Data for 1981 and 1982 are not available.

Source: Compiled from official statistics of the United Nations.

Table B-42.--Pharmaceuticals: Taiwan exports, by principal markets
and by specified years, 1963-82 1/

(In thousands of dollars)				
Market	1963	1967	1972	1977
	-----1,000 dollars-----			
Netherlands-----	-	-	878	-
West Germany-----	-	-	678	-
Thailand-----	204	328	607	-
Hong Kong-----	22	37	591	-
Japan-----	-	1	415	-
All other-----	31	334	5,680	-
Total-----	257	700	8,849	-

1/ Data for 1981 and 1982 are not available.

Source: Compiled from official statistics of the United Nations.

Table B-43.--Pharmaceuticals: U.S. and selected countries' 1/ exports to world markets, by specified years, 1963-82

(In thousands of dollars)				
Year	:	U.S. exports	:	Selected countries' exports
	:		:	
1963-----	:	269,257	:	19,094
1967-----	:	287,978	:	26,059
1972-----	:	530,000	:	40,232
1977-----	:	1,461,000	:	75,155
1981-----	:	2,228,000	:	<u>2/</u>
1982-----	:	2,502,000	:	<u>2/</u>
	:		:	

1/ Brazil, Korea, Mexico, and Taiwan.

2/ Not available.

Source: Compiled from official statistics of the U.S. Department of Commerce and United Nations data.

Note.--Quantity data are not available.

Table B-44.--Semiconductors: U.S. exports, by principal markets,
by specified years 1972 to 1981

(In thousands of dollars)				
Market	1972	1977	1981	
Malaysia-----	1,185	244,548	725,734	
Singapore-----	64,117	224,654	437,934	
Philippines-----	116	63,249	387,222	
Canada-----	25,639	38,303	240,436	
Korea-----	172	142,187	228,332	
Mexico-----	46,129	86,602	220,597	
Thailand-----	105	15,439	184,971	
West Germany-----	45,794	113,127	182,315	
All other-----	290,293	578,950	999,438	
Total-----	473,550	1,507,059	3,606,979	

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table B-45.--Steel Mill Products: U.S. exports, by principal markets
and by specified years, 1963-82

(In thousands of dollars)						
Market	1963	1967	1972	1977	1981	1982
Canada-----	99,609	143,036	196,670	317,933	672,358	403,008
Mexico-----	15,363	24,651	36,534	104,128	648,193	269,088
Saudi Arabia----	1,389	1,432	5,127	39,234	150,391	211,969
Venezuela-----	21,267	10,547	25,635	78,711	78,812	110,005
United Kingdom--	7,123	18,492	22,635	39,484	85,331	57,790
Egypt-----	1,994	985	2,230	16,925	38,666	52,831
Taiwan-----	7,343	9,121	6,882	25,363	55,801	49,384
Korea-----	3,470	4,469	1,375	5,265	28,604	45,885
All other-----	319,575	264,243	381,358	623,753	853,602	739,957
Total-----	477,133	476,976	678,446	1,250,856	2,611,758	1,939,917

Source: Compiled from official statistics of the United Nations.

Table B-46.--Steel mill products: Brazilian exports, by principle markets
and by specified years, 1963-82

(In thousands of dollars)						
Market	1963	1967	1972	1977	1981	1982
United States-----	2	13,953	24,806	15,350	272,353	201,378
Argentina-----	79	15,605	12,898	8,791	33,071	52,437
Belgium and Luxembourg--	-	3	71	125	34,352	48,325
Saudi Arabia-----	-	-	-	-	5,423	43,196
Iraq-----	-	-	-	-	43,092	38,364
Japan-----	-	-	962	3	4,018	34,197
Venezuela-----	-	131	222	5,932	13,254	23,372
Nigeria-----	-	-	67	7,571	22,560	19,760
All other-----	381	3,555	14,873	53,454	269,543	273,204
Total-----	462	33,247	53,899	91,226	697,666	734,233

Source: Compiled from official statistics of the United Nations.

Table B-47.--Steel mill products: Mexican exports, by principle markets and by specified years, 1963-82 1/

(In thousands of dollars)					
Market	1963	1967	1972	1977	
United States-----	17,584	12,478	50,134	51,661	
Guatemala-----	154	46	1,756	4,767	
Venezuela-----	288	370	255	4,348	
Brazil-----	3,950	30	942	575	
Peru-----	639	1,526	1,428	477	
Trinidad and Tobago---	-	-	19	362	
Colombia-----	15	-	1,183	315	
El Salvador-----	40	32	70	302	
All other-----	1,423	853	6,080	1,146	
Total-----	24,093	15,335	61,867	63,953	

1/ Data not available for 1981 and 1982.

Source: Compiled from official statistics of the United Nations.

Table B-48.--Steel mill products: Taiwan exports, by principle markets and by specified years, 1963-82 1/

(In thousands of dollars)					
Market	1963	1967	1972	1977	
Saudi Arabia-----	-	205	10,518	20,667	
Hong Kong-----	586	347	4,792	7,601	
United States-----	309	138	18,465	22,276	
Singapore-----	87	102	1,325	2,862	
Indonesia-----	-	55	18,762	5,357	
Malaysia-----	-	-	1,434	671	
Greece-----	-	-	56	43	
Philippines-----	21	244	647	479	
All other-----	5,970	11,624	13,863	30,564	
Total-----	6,973	12,715	69,862	90,520	

1/ Data not available for 1981 and 1982.

Source: Compiled from official statistics of the United Nations.

Table B-49.--Steel mill products: Korean exports, by principle markets and by specified years, 1963-82 1/

(In thousands of dollars)					
Market	1963	1967	1972	1977	1981
United States-----	21	41	71,575	186,503	534,311
Japan-----	10	414	1,942	9,418	382,952
Saudi Arabia-----	-	-	503	23,548	203,549
Taiwan-----	-	-	2,540	28,556	92,327
India-----	-	-	78	2,631	87,604
Indonesia-----	-	-	1,412	16,249	65,808
Australia-----	-	-	-	11,850	41,929
Singapore-----	-	-	307	4,067	41,205
All other-----	10,995	1,263	12,253	84,599	366,990
Total-----	11,026	1,718	90,610	367,421	1,816,675

1/ Data not available for 1982.

Source: Compiled from official statistics of the United Nations.

Table B-50.--Steel mill products: U.S. and selected countries' 1/ exports to world markets, by specified years, 1963-82

(In thousands of dollars)		
Year	U.S. exports	Selected countries <u>1/</u> exports
1963-----	477,133	42,554
1967-----	476,976	63,015
1972-----	678,446	276,238
1977-----	1,250,856	613,120
1981-----	2,611,751	<u>2/</u> 2,514,341
1982-----	1,939,917	<u>3/</u> 734,233

1/ Brazil, Mexico, Korea, and Taiwan.

2/ Data are understated because they do not include Mexico's or Taiwan's exports.

3/ Data are understated because they do not include Mexico's, Taiwan's, or Korea's exports.

Source: Compiled from official statistics of the United Nations.

Table 51.--Telecommunications apparatus: U.S. exports, by principal markets and by specified years, 1963-82

(In thousands of dollars)							
Market	1963	1967	1972	1977	1981	1982	
Canada-----	47,465	92,428	183,631	293,627	388,784	423,118	
Mexico-----	5,375	13,272	79,065	166,915	275,255	362,237	
West Germany----	14,476	33,736	66,405	101,811	209,831	253,512	
United Kingdom--	12,394	30,737	49,445	102,637	286,035	227,761	
Japan-----	5,524	21,431	45,157	71,358	160,376	159,553	
Korea-----	938	6,127	7,545	67,925	303,404	136,158	
Taiwan-----	1,584	10,041	57,546	67,457	132,952	122,467	
Saudi Arabia----	1,423	5,681	2,892	138,703	168,173	129,377	
All other-----	383,397	261,373	344,338	1,113,081	1,660,862	1,611,300	
Total-----	472,576	474,826	836,024	2,123,514	3,485,530	3,526,842	

Source: Compiled from official statistics of the United Nations (based on data reported by the United States).

Table B-52.---Telecommunications apparatus: Brazilian exports, by principal markets and by specified years, 1963-82

(In thousands of dollars)							
Market	1963	1967	1972	1977	1981	1982	
United States---	-	1	2,664	87,287	86,759	88,767	
West Germany----	-	-	28	2,273	5,904	23,187	
Argentina-----	3	19	206	844	31,208	16,516	
Colombia-----	-	-	754	768	3,576	9,359	
Mexico-----	-	70	759	970	18,919	8,045	
Venezuela-----	9	8	507	2,547	2,272	7,037	
Peru-----	2	5	447	2,213	3,444	3,834	
Chile-----	25	37	77	359	4,180	3,344	
All other-----	48	271	7,724	28,132	49,743	21,064	
Total-----	87	348	13,166	127,542	206,005	181,153	

Source: Compiled from official statistics of the United Nations.

Table B-53.--Telecommunications apparatus: Exports of EC member states to each other, specified years 1963 to 1981

(In thousands of dollars)						
Country	1963	1967	1972	1977	1981	
France-----	39,402	50,617	135,310	477,971	723,964	
West Germany-----	52,537	63,407	223,392	384,280	657,758	
Italy-----	25,414	29,460	80,319	360,378	576,530	
Netherlands-----	104,202	119,867	272,141	649,678	575,287	
United Kingdom-----	10,386	17,713	89,038	139,301	408,659	
Belgium-Luxembourg-----	25,699	29,876	129,403	263,625	355,781	
Greece-----	12,719	15,926	74,444	56,084	167,636	
Ireland-----	7,291	5,961	18,586	41,200	100,980	
Denmark-----	11,214	15,766	35,947	80,692	97,256	
Total-----	288,864	348,593	1,058,580	2,453,209	3,663,824	

Source: Compiled from the official statistics of the United Nations.

Table B-54.--Telecommunications apparatus: Korean exports, by principal markets and by specified years, 1963-82

(In thousands of dollars)						
Market	1963	1967	1972	1977	1982	
United States-----	39	1,260	14,213	206,213	528,260	
Hong Kong-----	1	296	2,286	7,142	94,990	
Canada-----	12	22	1,479	32,096	61,880	
West Germany-----	3	233	3,015	33,8940	59,259	
Japan-----	3	15	2,970	32,861	49,546	
Panama-----	0	87	169	7,503	36,959	
United Kingdom-----	0	33	222	14,205	33,092	
Netherlands-----	0	58	185	9,852	20,436	
All other-----	75	345	1,503	50,144	233,594	
Total-----	133	2,349	26,042	394,306	1,118,016	

Source: Compiled from official statistics of the United Nations.

Table B-55.--Telecommunications apparatus: Mexican exports 1/ by principal markets and by specified years, 1963-82

(In thousands of dollars)						
Market	1963	1967	1972	1977	1981	1982
United States-----	143	1,248	36,200	2,871		
West Germany-----	-	-	17	2,273		
Ecuador-----	-	1	1	565		
Chile-----	-	14	8	517	<u>2/</u>	<u>2/</u>
Argentina-----	29	1,223	1,722	434		
Brazil-----	-	328	997	404		
Peru-----	1	4	59	226		
Bolivia-----	-	1	21	219		
All other-----	110	661	1,446	763		
Total-----	283	3,480	40,471	8,272		

1/ The export data are not believed to include export data for the 10 kilometer Mexican border free-trade zone.

2/ Data for 1980, and later not available.

Source: Compiled from official statistics of the United Nations.

Table B-56.--Telecommunications apparatus: Taiwan exports, by principal markets and by specified years, 1963 to 1982

(In thousands of dollars)				
Market	1963	1967	1972	1977
United States-----	525	25,779	309,310	592,321
West Germany-----	-	293	9,380	38,805
Hong Kong-----	10	605	16,945	27,657
Japan-----	-	990	8,465	24,942
Panama-----	-	-	1,834	23,064
Canada-----	-	499	12,289	19,535
Netherlands-----	-	31	3,079	18,309
United Kingdom-----	8	39	4,899	14,208
All other-----	-	-	-	-
Total-----	569	29,093	378,086	853,614

Source: Compiled from official statistics of the United Nations.

Table B-57.--Telecommunications apparatus: U.S. and selected countries exports 1/ to world markets, by specified years, 1963-82

(In thousands of dollars)		
Year	U.S. exports	Other major U.S. trading partners' exports
1963-----	945,152	51,361
1967-----	949,646	150,262
1972-----	836,024	647,985
1977-----	2,123,512	1,747,661
1981-----	3,485,535	<u>2/</u> 1,705,072
1982-----	3,526,841	<u>3/</u> 667,573

1/ Canada, Mexico, Brazil, Taiwan, and Korea.

2/ Data for 1981 are understated because of unavailability of data for Mexico and Taiwan.

3/ Data for 1982 are understated because of unavailability of data for Mexico, Taiwan, and Korea.

Source: Compiled from official statistics of United Nations data.

Note.--Quantity data are not available.

Table B-58.--Textiles: U.S. exports, by principal markets and by specified years, 1963-82

(In thousands of dollars)					
Market	1963	1967	1972	1977	1982
Canada-----	112,401	134,363	229,886	517,560	500,980
United Kingdom-----	18,260	26,508	54,574	127,302	161,658
Saudi Arabia-----	442	852	1,808	28,468	156,267
China-----	-	-	-	607	127,943
Australia-----	22,126	27,181	22,904	81,257	118,635
Mexico-----	7,197	8,558	16,557	38,193	105,743
Japan-----	5,391	9,433	51,723	53,063	100,572
Belgium and Luxembourg--	14,367	16,213	33,111	118,837	99,426
Venezuela-----	17,686	12,560	15,429	55,163	90,131
All other-----	293,444	296,116	352,806	935,780	1,310,511
Total-----	491,314	530,932	778,798	1,956,230	2,771,906

Source: Compiled from official statistics of the United Nations.

Table B-59.--Textiles: Brazilian exports, by principal markets and by specified years, 1963-82

(In thousands of dollars)					
Market	1963	1967	1972	1977	1982
United States-----	1,558	5,186	20,452	52,338	73,084
West Germany-----	24	53	18,007	73,411	70,410
Italy-----	43	20	4,709	23,561	31,385
Canada-----	-	355	6,830	14,342	23,829
Nigeria-----	-	-	55	12,297	23,237
Japan-----	-	138	5,960	9,433	19,738
France-----	22	3	1,788	11,511	19,358
East Germany-----	-	-	-	8,547	17,748
Argentina-----	225	3,346	3,761	3,154	17,457
All other-----	1,893	1,910	48,825	174,155	226,492
Total-----	3,765	11,011	110,387	382,749	522,738

Source: Compiled from official statistics of the United Nations.

Table B-60.--Textiles: Korean exports, by principal markets and by specified years, 1963-82 1/

(In thousands of dollars)

Market	1963	1967	1972	1977	1981
Japan-----	680	5,874	44,201	283,967	425,348
Hong Kong-----	1,457	9,864	27,249	115,964	407,433
United States-----	3,740	10,721	24,016	57,996	191,833
Saudi Arabia-----	0	569	2,118	80,999	145,670
Singapore-----	159	2,179	4,120	34,870	107,119
West Germany-----	109	341	5,254	40,309	75,440
Australia-----	49	879	1,749	18,690	66,408
Kuwait-----	0	188	1,328	19,725	48,356
Egypt-----	0	7	434	13,545	40,830
All other-----	1,608	18,417	66,054	415,282	940,489
Total-----	7,802	49,039	176,523	1,081,347	2,448,926

1/ Data not available for 1982.

Source: Compiled from official statistics of the United Nations.

Table B-61.--Textiles: Taiwan exports, by principal markets and by specified years 1963-82 1/

(In thousands of dollars)

Market	1963	1969	1972	1977	1980
Hong Kong-----	11,049	22,083	102,900	281,888	585,886
Japan-----	61	2,385	25,299	43,827	168,149
Singapore-----	1,471	2,996	30,041	58,772	116,547
Nigeria-----	30	1,833	10,421	12,630	91,719
United States-----	2,383	7,724	18,535	46,648	80,498
West Germany-----	138	175	11,533	32,845	59,113
Australia-----	1,975	2,662	12,031	29,682	52,484
Italy-----	911	3,294	15,654	29,298	50,339
Philippines-----	84	152	2,288	31,684	38,721
All other-----	20,620	40,265	117,269	357,574	527,770
Total-----	38,722	83,569	345,971	924,848	1,771,226

1/ Data not available for 1981 and 1982.

Source: Compiled from official statistics of the United Nations.

Table B-62.--Textiles: U.S. and Selected countries' 1/ exports to world markets, by specified years, 1963-82

(In thousands of dollars)			
Year	:	U.S. exports	:Selected countries'
	:		: exports
1963-----	:	491,314 :	50,289
1967-----	:	530,932 :	143,619
1972-----	:	778,798 :	632,881
1977-----	:	1,936,203 :	2,388,944
1981-----	:	3,618,903 :	<u>2/</u> 382,749
1982-----	:	2,771,906 :	<u>2/</u> 522,738
	:		:

1/ Brazil, Korea, and Taiwan.

2/ Data for Brazil only; in 1977, Brazil accounted for 16 percent of exports from these 3 sources.

Source: Compiled from official statistics of the United Nations.

Table B-63.--U.S. producers' shipments, exports of domestic merchandise, imports for consumption, total and from other major U.S. trading partners, apparent consumption, and employment in alleged targeted industries, specified years 1963 to 1982

Industry and year	Producers' shipments 1/	Exports	Imports		Consumption 1/	Ratio of imports from other major trading partners to--		Total employment
			Total	From other major U.S. trading partners		Total imports	Consumption 1/	
1,000 dollars			Percent			1,000 workers		
Aircraft and aerospace:								
1963-----	6,086,000	1,084,216	91,099	2/ 55,810	5,092,883	61.3	1.1	723
1967-----	9,975,000	1,518,480	249,173	2/ 187,317	8,705,693	75.2	2.2	991
1972-----	11,648,000	2,919,408	409,720	2/ 262,001	9,139,312	63.9	2.9	588
1977-----	16,447,000	5,865,777	600,613	2/ 195,500	11,181,836	32.6	1.7	566
1978-----	19,654,000	8,150,000	660,000	2/ 182,949	12,194,000	27.7	1.5	620
1979-----	26,705,000	9,662,000	1,077,000	2/ 305,931	18,120,000	28.4	1.7	713
1980-----	31,929,000	12,761,000	1,908,000	2/ 533,422	21,076,000	28.0	2.5	766
1981-----	35,963,000	14,612,000	2,586,000	2/ 1,468,113	23,937,000	56.8	6.1	777
1982-----	33,858,000	11,638,000	2,481,000	2/ 855,048	24,701,000	34.5	3.5	739
Apparel:								
1967-----	20,614,500	126,285	649,224	3/ 46,145	21,137,439	7.1	.2	1,398.0
1972-----	26,326,900	209,980	1,760,169	3/ 494,412	27,877,089	28.1	1.8	1,368.2
1977-----	34,784,100	560,159	3,734,765	3/ 1,259,103	37,958,706	33.7	3.3	1,334.4
1978-----	38,747,300	600,503	4,877,977	3/ 1,741,439	43,024,774	35.7	4.0	1,321.8
1979-----	39,081,700	843,140	5,065,023	3/ 1,803,476	43,303,583	35.6	4.2	1,306.2
1980-----	42,481,500	1,093,495	5,782,703	3/ 2,197,388	47,170,708	38.0	4.7	1,307.3
1981-----	46,018,100	1,128,983	6,857,002	3/ 2,556,978	51,746,119	37.3	4.9	1,251.1
1982-----	46,122,400	846,548	7,506,856	3/ 2,734,530	52,782,708	36.4	5.2	1,175.0
Automatic data processing machines (computers):								
1978-----	17,621,100	4,138,886	755,353	3/ 59,255	14,237,567	7.8	.04	250.7
1979-----	22,768,500	5,401,821	968,329	3/ 56,710	18,335,008	5.9	.03	292.6
1980-----	28,111,900	7,483,107	1,159,045	5/	21,787,838	5/		323.7
1981-----	33,416,400	8,506,198	1,646,771	5/	26,556,973	5/		336.2
1982-----	33,938,400	8,968,923	2,296,278	5/	27,265,755	5/		340.0
Automobiles:								
1963-----	14,427,000	290,720	464,291	6/ 1,850	4,600,571	0.4	0.0	360.5
1967-----	15,653,000	823,575	1,751,094	6/ 856,433	16,580,519	48.9	5.2	401.0
1972-----	23,133,000	1,323,396	5,851,431	6/ 2,697,680	27,661,035	46.1	9.8	415.2
1977-----	32,066,000	3,631,670	11,182,064	6/ 4,314,579	39,616,394	38.6	10.9	443.0
1978-----	31,984,000	3,700,906	14,865,633	6/ 4,606,615	43,148,727	31.0	10.7	469.7
1979-----	50,100,000	4,743,301	16,016,046	6/ 4,090,408	61,372,745	25.6	6.7	463.0
1980-----	41,000,000	4,030,922	18,017,309	6/ 3,872,456	54,986,387	21.5	7.1	368.1
1981-----	43,800,000	4,025,593	18,878,735	6/ 4,325,472	58,653,142	22.9	7.4	358.7
1982-----	38,500,000	2,936,860	21,465,152	6/ 5,834,437	57,028,292	27.2	10.2	317.5

See footnotes at end of table.

Table B-63.--U.S. producers' shipments, exports of domestic merchandise, imports for consumption, total and from other major U.S. trading partners, apparent consumption, and employment in alleged targeted industries, specified years 1963 to 1982--Continued

Industry and year	Producers' shipments 1/	Exports	Imports		Consumption 1/	Ratio of imports from other major trading partners to--		Total employment
			Total	From other major U.S. trading partners		Total imports	Consumption 1/	
			1,000 dollars		Percent		1,000 workers	
Crude petroleum:								
1963-----	7,969,820	5/	1,024,973	7/ 248,645	8,994,793	24	3	164
1967-----	9,389,967	85,565	1,078,541	7/ 423,822	10,382,943	39	4	150
1972-----	10,418,711	565	2,383,209	7/ 953,486	14,096,342	40	7	117
1977-----	25,790,772	209,569	33,546,674	7/ 2,292,889	59,127,877	7	4	134
1978-----	28,602,495	389,443	32,297,830	7/ 2,842,227	60,510,890	9	5	146
1979-----	39,455,507	394,036	46,058,234	7/ 4,910,639	85,119,705	11	6	167
1980-----	67,747,369	750,541	61,899,003	7/ 8,120,013	128,895,831	13	6	190
1981-----	99,401,340	576,795	61,457,915	7/ 7,933,732	160,282,460	13	5	215
1982-----	90,263,376	468,870	45,723,820	7/ 9,929,958	135,518,326	22	7	207
Drugs and related products (pharmaceuticals):								
1963-----								
1967-----								
1972-----	8,019,000	530,000	245,000	3/ 6,857	7,734,000	2.80	.09	132
1977-----	14,248,000	1,461,000	657,000	3/ 21,121	13,444,000	3.21	.16	157
1978-----	15,898,000	1,480,000	885,000	3/ 19,034	15,303,000	2.15	.12	154
1980-----	21,883,000	2,004,000	970,000	3/ 21,647	20,849,000	2.23	.10	164
1981-----	22,667,000	2,228,000	1,068,000	3/ 27,350	21,507,000	2.56	.13	170
1982-----	26,102,000	2,319,000	1,096,000	3/ 26,291	24,879,000	2.40	.11	180
Footwear:								
1963-----	2,668,200	9,562	124,220	8/ 1,088	2,782,858	9/	9/	242
1967-----	3,317,400	9,266	261,343	8/ 8,246	3,569,477	3.2		240
1972-----	3,675,960	11,036	835,000	8/ 168,508	4,499,924	20.2	3.4	224
1977-----	4,665,400	41,565	1,848,800	8/ 878,078	6,472,635	45.9	13.6	184
1978-----	4,206,300	51,637	2,662,322	8/ 1,205,921	6,816,985	45.3	17.7	182
1979-----	4,749,000	83,091	2,908,580	8/ 1,271,638	7,574,489	43.7	16.8	169
1980-----	5,166,100	130,765	2,957,081	8/ 1,698,687	7,992,416	57.4	21.2	165
1981-----	5,450,900	140,564	3,141,219	8/ 2,000,781	8,451,555	63.7	23.7	166
1982-----	5,196,000	119,579	3,433,639	8/ 2,015,573	8,510,060	58.7	23.7	157
Heavy electrical equipment:								
1963-----	5/	5/	5/	10/ 2,200	5/	5/	5/	5/
1967-----	5/	5/	5/	10/ 7,800	5/	5/	5/	5/
1972-----	1,500,000	550,000	5/	10/ 8,400	5/			45
1977-----	1,270,000	418,600	16,700	10/ 4,100	868,100	24.6	.5	40
1978-----	1,300,000	390,200	19,500	10/ 4,600	929,300	23.6	.5	38
1979-----	1,100,100	395,500	27,800	10/ 7,700	732,300	27.7	1.1	35
1980-----	1,150,000	791,600	44,100	10/ 11,500	402,500	26.1	2.9	32
1981-----	1,175,000	554,500	33,100	10/ 10,300	653,600	31.1	1.6	30
1982-----	1,200,000	570,000	34,500	10/ 13,400	664,500	38.8	2.0	29

See footnotes at end of table.

Table B-63.--U.S. producers' shipments, exports of domestic merchandise, imports for consumption, total and from other major U.S. trading partners, apparent consumption, and employment in alleged targeted industries, specified years 1963 to 1982--Continued

Industry and year	Producers' shipments 1/	Exports	Imports		Consumption 1/	Ratio of imports from other major trading partners to--		Total employment
			Total	From other major U.S. trading partners		Total imports	Consumption 1/	
			1,000 dollars			Percent		1,000 workers
Iron and steel mill products:								
1963-----	12,837,000	477,133	633,188	1/ 3/ 17,916	12,993,055	2.8	.1	520
1967-----	15,342,000	476,976	1,292,195	1/ 3/ 26,610	16,139,219	2.1	.2	555
1972-----	19,754,000	678,446	2,793,648	1/ 3/ 164,980	21,869,202	5.9	.8	478
1977-----	35,853,000	1,250,856	5,531,317	1/ 3/ 275,790	40,133,461	5.0	.7	452
1978-----	42,545,000	1,531,215	6,916,865	1/ 3/ 514,493	41,630,650	7.4	1.2	449
1979-----	48,071,000	2,855,357	6,966,737	1/ 3/ 590,353	52,182,380	8.5	1.1	453
1980-----	43,668,000	2,611,751	6,885,355	1/ 3/ 654,138	47,941,604	9.5	1.4	399
1981-----	51,367,000	2,611,751	10,247,660	1/ 3/ 921,544	59,002,909	9.0	1.6	391
1982-----	34,577,000	1,939,917	8,958,396	1/ 3/ 838,680	41,595,479	9.4	2.0	289
Machine tools:								
1963-----	1,450,600	185,483	44,291	11/ 27,600	1,309,408	62	2	84
1967-----	2,803,800	222,432	203,411	11/ 115,900	2,784,779	57	4	104
1972-----	1,903,900	238,107	139,327	11/ 67,700	1,805,120	49	4	78
1977-----	3,679,900	426,729	485,981	11/ 168,900	3,739,152	35	5	84
1978-----	4,732,800	738,648	835,677	11/ 283,200	4,829,829	34	6	95
1979-----	6,120,500	878,630	1,241,513	11/ 370,900	6,483,383	30	6	108
1980-----	7,216,700	1,093,598	1,518,832	11/ 445,000	7,641,934	29	6	109
1981-----	7,630,000	1,453,067	1,726,144	11/ 421,200	7,903,077	24	5	111
1982-----	5,548,900	1,010,855	1,497,497	11/ 382,100	6,035,542	26	6	88
Natural gas:								
1963-----	2,317,316	17,853	5/	5/	5/	5/	5/	164
1967-----	2,907,412	64,134	145,715	7/ 145,305	2,988,993	99	5	150
1972-----	4,866,847	60,300	215,948	7/ 214,554	5,022,495	99	4	117
1977-----	15,818,750	101,078	1,925,747	7/ 1,898,003	17,643,419	99	11	134
1978-----	18,076,470	116,194	1,994,444	7/ 1,932,158	19,954,720	97	10	146
1979-----	23,248,950	130,158	2,765,408	7/ 2,468,370	25,884,200	89	10	167
1980-----	32,086,200	225,353	3,936,729	7/ 3,676,040	35,797,576	93	10	190
1981-----	39,512,880	335,021	4,117,925	7/ 3,912,334	43,295,784	95	9	215
1982-----	45,559,200	292,748	4,391,080	7/ 4,140,226	49,657,532	94	8	207
Semiconductors:								
1972-----	2,704,800	473,550	330,278	3/ 42,482	2,561,528	12.9	1.7	98
1977-----	4,532,300	1,507,259	1,356,025	3/ 77,014	4,381,066	5.7	1.8	114
1978-----	5,402,593	1,952,839	1,790,338	3/ 90,437	5,240,092	5.1	1.7	134
1979-----	7,056,797	2,634,823	2,447,662	3/ 172,281	6,869,636	7.0	2.5	161
1980-----	8,993,780	3,477,234	3,348,107	3/ 227,528	8,864,653	6.8	2.6	185
1981-----	9,671,694	3,606,979	3,617,584	3/ 208,686	9,682,299	5.8	2.2	105
1982-----	10,370,000	3,821,715	4,205,115	3/ 197,859	10,753,400	4.7	1.8	197

See footnotes at end of table.

Table B-63.--U.S. producers' shipments, exports of domestic merchandise, imports for consumption, total and from other major U.S. trading partners, apparent consumption, and employment in alleged targeted industries, specified years 1963 to 1982--Continued

Industry and year	Producers' shipments ^{1/}	Exports	Imports		Ratio of imports from other major trading partners to--		Total employment
			Total	From other major U.S. trading partners	Consumption ^{1/}	Consumption ^{1/}	
			1,000 dollars			Percent	1,000 workers
Telecommunications:							
1963-----	9,327,000	528,928	75,791	12/ 41,287	8,873,863	54.5	558
1967-----	12,866,100	472,188	497,186	12/ 95,762	12,489,674	19.3	642
1972-----	15,479,100	698,541	1,774,058	12/ 480,860	16,554,617	27.1	540
1977-----	24,727,400	2,123,512	3,658,010	12/ 1,248,084	28,385,410	34.1	534
1978-----	28,387,526	2,455,643	4,855,383	12/ 1,810,022	30,787,266	37.2	580
1979-----	32,334,768	2,682,557	4,817,865	12/ 2,337,251	34,470,676	48.5	600
1980-----	38,363,246	3,120,399	5,369,751	12/ 2,421,586	40,612,598	45.1	631
1981-----	43,110,500	3,500,430	6,643,570	12/ 2,831,897	46,253,640	42.6	635
1982-----	49,608,809	3,554,714	6,690,111	12/ 2,906,525	52,744,206	43.4	590
Textiles:							
1967-----	19,797,000	530,932	811,904	13/ 23,361	20,077,972	2.9	957
1972-----	28,064,000	778,779	1,525,100	13/ 67,271	28,810,321	4.4	986
1977-----	40,551,000	1,958,933	1,772,363	13/ 156,388	40,364,430	8.8	910
1978-----	42,281,000	2,225,382	2,200,130	13/ 211,912	42,255,748	9.6	899
1979-----	45,137,000	3,189,351	2,216,363	13/ 222,351	44,164,012	10.0	885
1980-----	47,256,000	3,632,043	2,493,319	13/ 324,738	46,117,276	13.0	848
1981-----	50,251,000	3,618,903	3,045,920	13/ 443,736	49,688,017	14.6	823
1982-----	47,217,000	2,784,108	2,807,479	13/ 425,892	47,240,371	15.2	750

^{1/} Estimated by the staff of the U.S. International Trade Commission.

^{2/} Brazil and Canada.

^{3/} Brazil, Korea, Mexico, and Taiwan.

^{4/} Production data revised by the U.S. Department of Commerce.

^{5/} Not available.

^{6/} Brazil, Canada, Korea and Mexico.

^{7/} Canada and Mexico.

^{8/} Brazil, Korea, and Taiwan.

^{9/} Less than 0.05 percent.

^{10/} Brazil and Korea.

^{11/} Korea, and Taiwan.

^{12/} Brazil, Canada, Korea, Mexico and Taiwan.

^{13/} Brazil, Korea, and Taiwan.

Source: Compiled from official statistics of the U.S. Department of Commerce and official statistics of the United Nations.

