

1126
S
173 CA
op. 2

UNITED STATES TARIFF COMMISSION

**DOMESTIC AND FOREIGN GOVERNMENT
PROGRAMS AND POLICIES AFFECTING
U. S. AGRICULTURAL TRADE**

**Report on Investigation No. 332-59
Under Section 332 of the
Tariff Act of 1930, as Amended**



**TC Publication 613
Washington, D.C.
October 1973**

UNITED STATES TARIFF COMMISSION

Catherine Bedell, *Chairman*

Joseph O. Parker, *Vice Chairman*

Will E. Leonard, Jr.

George M. Moore

J. Banks Young

Italo H. Ablondi

Kenneth R. Mason, *Secretary*

Address all communications to

United States Tariff Commission

Washington, D. C. 20436

PREFACE

This study, initiated by the Tariff Commission on its own motion, examines those measures of the United States and its principal trading partners that affect the flow of agricultural products in international trade, with the aim of assessing the impact of such measures on the agricultural exports and imports of the United States. Special attention is given to major nontariff barriers (e.g., variable levies, import quotas, and state trading) inasmuch as their role in restraining agricultural trade has become increasingly important as tariffs have been lowered over the years.

This report is a summary of the major findings of the study. The full report is contained in a Tariff Commission staff research paper which may be examined in the library of the U.S. Tariff Commission, 8th and E Streets, N.W., Washington, D.C.

The report consists of three parts. Part I examines the principal agricultural and foreign trade measures of the major trading partners and competitors of the United States, identifying those policies exerting a significant influence on U.S. agricultural trade. Part II performs a similar review for the United States, focusing on U.S. agricultural and foreign trade measures which affect its trade in agricultural products. Part III presents an econometric model to measure the quantitative impact of applicable restraints discussed earlier in the study on international trade in three interrelated commodities--wheat, feed grains,

and beef. Wheat and feed grains are major U.S. agricultural export commodities, together accounting for nearly one-third of the value of U.S. agricultural exports in 1972; beef is a major import item, accounting for about 13 percent of the value of U.S. agricultural imports in 1972. An attempt is made in parts I and II to assess the impact of governmental restraints on agricultural trade, although the evaluation there is mainly in qualitative terms and does not measure statistically the numerous factors that normally affect foreign trade in any commodity. The consequences of specific restraints on trade are statistically measured in part III for the three major commodities included.

The governmental measures reviewed in the report consist of domestic programs that have an important effect on a country's production, pricing, and marketing of internationally traded agricultural commodities in which the United States has an interest, and the principal measures that govern a country's foreign trade in those commodities and which are frequently an outgrowth of the domestic programs that have been adopted. Included in the first group are such measures as price-support programs, marketing orders, and acreage allotment programs or other production control measures. In the second group are import restraints (such as variable levies 1/), preferential trading arrangements, and export subsidies and other forms of governmental assistance

1/ Variable levies are import charges which are calculated at frequent intervals and are designed to bring the price of an imported article up to a minimum import price.

to exports (such as concessional sales). Also affecting trade in agricultural products are nontariff barriers that distort international competition, such as quantitative restrictions, licensing requirements, exchange restrictions, state trading, and mixing regulations. The principal import controls other than fixed import duties employed by the major countries engaging in international agricultural trade are discussed in the report. Most countries also have health, sanitary, and grade standards which are applicable to imports; such standards are not discussed in detail in this report.

The countries and regional trading blocs considered in some detail in the study play major roles in the foreign agricultural trade of the United States, either as major export markets, major sources of imports, or major competitors of the United States in world markets. The European Community--the leading foreign destination for U.S. agricultural products--is discussed as a single entity. Likewise, the European Free Trade Association and the Latin American Free Trade Association are each discussed broadly as a unit, but major U.S. trading partners in these blocs are also treated separately inasmuch as each bloc member maintains its own trade regulations with third countries. The programs and policies of Japan, the largest single-country market for U.S. agricultural products, are reviewed, as well as those of foreign competitors of the United States, which include Canada (also a principal U.S. market for agricultural products), Australia, New Zealand, and South Africa. Major country recipients of U.S. Government-assisted agricultural exports are also discussed, since collectively they have accounted for

a significant share of U.S. agricultural exports; the discussions focus on the extent of progress made in these countries to lessen their dependence on U.S. assistance, and thus provide a basis for evaluating the future role of such Government-assisted shipments in total U.S. agricultural export trade.

Government agricultural policies and the agricultural situation change periodically as a result of changes in political situations, vagaries of weather, and so forth. Thus, some of the material included in this report is not reflective of the present situation. The period covered in this report generally ends with 1970. Several country discussions include more recent developments, notably modification of national programs preparatory to entering the European Community, but no attempt is made to analyze the implications of enlargement of the Community for U.S. agricultural trade. Moreover, developments have occurred in 1972 which have a significant bearing on U.S. agricultural trade, such as the large purchase of grain and soybeans by the Soviet Union from the United States and the rejection by Norway of entry into the European Community.

In addition to Tariff Commission staff in the Agriculture Division and in the Office of Economic Research, the following participated in preparing the foreign country or trading area discussions: Glynn McBride, Professor of Agricultural Economics, Michigan State University, and Stephen C. Schmidt, Professor of Agricultural Marketing and Policy, University of Illinois. Part III of the study, dealing with the statistical measurement of the effects of government programs and policies,

was written by D. Lee Bawden, Professor of Economics and Agricultural Economics, University of Wisconsin, and Andrew Schmitz, Associate Professor of Agricultural Economics, University of California (Berkeley). Personnel in the Agricultural Marketing Service, Economic Research Service, and the Foreign Agricultural Service of the U.S. Department of Agriculture reviewed the entire study and made many helpful suggestions.

C O N T E N T S

	<u>Page</u>
Preface-----	i
Foreign and Domestic Government Programs and Policies	
Affecting U.S. Agricultural Trade-----	1
European Community-----	1
European Free Trade Association-----	5
Latin American Free Trade Association-----	8
Central American Common Market-----	10
COMECON countries-----	11
Japan-----	12
Canada-----	13
Spain-----	14
Philippine Republic-----	15
Australia, New Zealand, South Africa-----	16
Recipients of U.S. Government-assisted exports-----	18
United States-----	19
Impact of restraints on trade in wheat, feed grains, and beef-----	25
APPENDIX.--Description of the econometric model-----	33

Foreign and Domestic Government Programs and Policies
Affecting U.S. Agricultural Trade

Part I

European Community (EC)

Inauguration of the European Economic Community in 1958 and implementation of its common agricultural policy (CAP) have been among the significant postwar developments affecting international agricultural trade. Beginning in 1962 with several transitional CAP regulations, notably for grains, the common agricultural policy was extended to other commodities so that by 1968 regulations covered more than 90 percent of the European Community's agricultural production. CAP features generally include establishment of support prices higher than world prices, without direct production controls. The high guaranteed prices encourage production and tend to restrain consumption, while variable levies--calculated at frequent intervals in response to changes in world market prices--are imposed on imports to guard the internal market from the effects of lower prices outside the Community. As the variable levy raises prices of imports to a designated minimum level, more efficient, lower cost outside suppliers are prevented from availing themselves of their comparative advantage. This pervasive characteristic of the CAP regulations--variable levies which raise prices of imports to designated minimum levels--in effect completely insulates the EC market from lower world prices and relegates other countries to the role of residual suppliers.

The combination of favorable producer prices and absence of direct production controls has resulted in increased production and surplus supplies of many commodities subject to CAP regulations. To move these surpluses into foreign markets, the EC provides export subsidies to permit sales at competitive prices in world markets.

The effect of the CAP on international agricultural trade has been most evident in grains, dairy products, and sugar--commodity areas in which the largest surpluses have been generated by EC policies. Aided by export subsidies, the EC has become an aggressive exporter of wheat. Intra-Community trade in wheat and other grains has expanded markedly. The EC has continued to import wheat, but imports consist mainly of certain types not grown locally in sufficient supply which are required either for specialized uses or for blending with the locally produced soft wheat to produce satisfactory flour. Surpluses of wheat have led to its increased use for animal feed, with subsidies paid to encourage use of feed wheat within the EC and to facilitate its exportation. Imports of feed grains into the Community have been smaller in recent years than in the mid-1960's, as EC production has expanded and more wheat has become available for feeding under the subsidy program.

Higher prices for milk under the CAP have provided an incentive to increase production and also to market a larger share of milk output rather than consume it on the farm as food or feed. Surplus dairy products acquired under the support program have been disposed of in several ways, including subsidized exportation; expenditures for dairy

export subsidies in the 1969/70 marketing year totaled the equivalent of more than \$500 million, compared with only \$18 million in 1964/65.

The CAP for sugar significantly stimulated production and resulted in substantial surpluses during the first years of operation following its full implementation in mid-1968. Surpluses have been used as live-stock feed, by the chemical industry, and have been exported to non-member countries under subsidy. The regulation provides for a variable levy on the sugar-added content of processed fruit. Subsidies granted on the sugar-added content of processed fruit and vegetables from the EC have resulted in the Community becoming a major supplier of processed fruit and vegetables to some third-country markets.

Since the institution of CAP regulations for poultry and eggs in 1962, the EC has become more than self-sufficient in these commodities and has resorted to subsidies to export its surpluses.

The CAP for tobacco, which became effective in July 1970, has not been in operation long enough for its effects to be evaluated. The principal features of the tobacco CAP include (1) guaranteed high (above world market) prices to producers without accompanying automatic production controls and (2) a substantial subsidy (buyer's premium) to induce purchase of Community tobacco.

The dislocating effects of the EC's common agricultural policy on international agricultural trade stem from the mechanisms accompanying its policy of high support prices that encourage uneconomic production. These mechanisms consist of (1) a system of variable levies on imports that, unlike fixed duties, cannot be surmounted by third-country

suppliers and (2) a system of export subsidies that has resulted for the United States both in competition from the Community in certain third markets and in increased competition from other exporters that seek new outlets for products diverted from customary markets. Use of export subsidies by the EC has compelled the United States to subsidize exports of poultry to Switzerland and lard to the United Kingdom to meet subsidized competition.

Preferential trade arrangements maintained by the European Community with associated countries and certain Mediterranean citrus-exporting countries also affect agricultural trade. Negotiations early in 1972 between the EC and the United States regarding trade concessions reflect U.S. concern over the preferential duties accorded to Mediterranean citrus-supplying countries by the EC.

Aside from the impediments of the CAP, there are relatively few Community-wide barriers to U.S. agricultural exports to the European Community. Import duties generally are moderate, and several important U.S. export items, such as soybeans, soybean meal, cotton, hides and skins, and--as of January 1, 1972--inedible tallow, enter free of duty. Some EC countries, however, have not removed all of the quantitative restrictions in effect before formation of the Community, and France and Italy have state tobacco monopolies which limit competitive access to these markets.

The European Community, considered as a whole, is the largest foreign market for U.S. agricultural products, accounting for more than one-fifth of total U.S. agricultural exports in recent years. A

statistical analysis was made (separate from the econometric model referred to later) of the impact of the formation of the EC on U.S. exports of certain agricultural commodities. This analysis (ending in 1967) indicated that establishment of the EC had an adverse effect on U.S. exports of poultry meat, rice, barley and other cereal grains (principally grain sorghum, oats, and rye), and preserved fruits and fruit preparations. For several other commodities, however, the period covered by the analysis does not reflect conditions affecting more recent trade patterns or having potential trade implications, such as full implementation of the EC grain regulations, application of supplementary levies on citrus imports and tariff preferences extended to certain Mediterranean citrus-producing countries, and the implementation of the tobacco CAP in 1970.

European Free Trade Association

Agricultural products are specifically excluded from the free-trade provisions of the convention establishing the European Free Trade Association (EFTA), and the policies of individual countries govern the agriculture of each member. Bilateral agreements between members have been the most effective instrument for stimulating intra-EFTA agricultural trade, but such trade has accounted for only a small part of total intra-EFTA trade. Two countries that were EFTA members--the United Kingdom and Denmark--became members of the European Community on January 1, 1973, and other EFTA countries--Austria, Norway, Portugal, Sweden, Switzerland, Iceland, and Finland (an associate member)--are seeking some form of preferential association with the EC.

Agricultural and trade policies in five of the EFTA countries are examined in this study. In the United Kingdom, a deficiency payment plan was in wide use until 1971, when a shift was started to a higher tariff and minimum import price system, using variable levies on imports. In part, this change was made to harmonize the United Kingdom's agricultural support system with that of the European Community, in view of the prospective entry of the United Kingdom into the Community. The deficiency payment system permitted prices to be determined by market forces; farmers were compensated for any difference between guaranteed prices and prices realized on the market. Imports could thus enter subject only to regular fixed duties. Commonwealth preference, however, gave an advantage to agricultural imports originating in British Commonwealth countries, and Commonwealth purchase agreements, which included sugar, Rhodesian tobacco (prior to Rhodesia's unilateral declaration of independence in 1965) and meat from Australia, also affected agricultural trade patterns.

Denmark has also modified its agricultural regulations in anticipation of transitional programs following its entry into the EC. Prior to the changeover, feed grains were supported by a system of minimum producer prices and variable import levies, while producers of livestock products received a blended price--a weighted average of high home market prices and lower export prices. The Danish Government has maintained extensive controls on virtually all imports of competitive agricultural products (e.g., fruits, vegetables, wheat, meat, and meat products) and in recent years exports of grains, beef, pork, poultry,

and dairy products were subsidized. Denmark maintained bilateral agreements with the United Kingdom and several other countries. Beginning in 1965, prices of bread grains were supported by regulations requiring minimum percentages of domestic grain in bread and by import restrictions when domestic supplies of such grains were ample. Effective February 1, 1973, the EC CAP replaced most Danish nontariff import restrictions.

In Switzerland the Government assists producers in dairying--the mainstay of Swiss agriculture--with price support and centralized marketing organizations. Domestic prices of Swiss dairy products, as well as those of its other agricultural products, are well above world market prices, and exports of cheese and other dairy products are subsidized. Wheat is subject to state trading and mixing regulations, while other grains and feedstuffs are subject to import control by means of supplementary import charges, conditional import regulations, quota restrictions, and licensing.

In Sweden agricultural measures formulated jointly by the Government and farmers' organizations provide price support and market regulations for cereals, livestock, and livestock products. Sweden employs a variable levy system, in which minimum import prices serve as guides for the application of supplementary import levies that apply to imports of all grains and feedstuffs, among other products. Commodities subject to variable import levies are also subject to quantitative restrictions under certain circumstances, but such restrictions have not been applied in recent years. As support prices for grains in Sweden are

well above world prices, export subsidies must be provided on virtually all export sales by that country.

Norway maintains a system of high agricultural price supports by (1) quantitative restriction of imports of certain livestock and horticultural products and (2) Government monopoly buying of imported cereals and feedstuffs. Quantitative control of imports is an essential feature of most Norwegian farm price-support programs, which keep prices of domestic products and competitive imports among the highest in Western Europe.

Latin American Free Trade Association

Integration of agricultural trade among the 11 members of the Latin American Free Trade Association (LAFTA) has been retarded by the reluctance of many of the member countries to relinquish control over national production and marketing of agricultural products. Conduct of agriculture in each of the LAFTA countries continues to be based on national policies guided by domestic considerations. Special trade preferences extended to fellow members have been altered or nullified through recourse to escape clauses provided in the 1960 treaty establishing LAFTA or by state trading and bilateral agreements. Duties on imports of agricultural products tend to be high in Mexico, Brazil, Colombia, and Chile but moderate in Argentina, Venezuela, Ecuador, and Peru. Exchange control ^{1/} and quotas are employed to a considerable extent in Mexico and in all the South American members of LAFTA, especially Venezuela,

^{1/} Exchange controls are direct government control of the demand for and supply of foreign exchange to maintain exchange rates and regulate balance-of-payments movements.

Colombia, and Ecuador. State trading 1/ agencies are the sole importers of many agricultural commodities entering Mexico, Chile, and Colombia.

In Mexico a high degree of protection is provided against imports of farm products; all exports from Mexico require prior licensing to assure both adequate domestic supplies and payment of applicable export taxes. The Government restricts exports of live cattle and beef. Increased U.S. imports of Mexican fruits and vegetables reflect the Mexican Government's encouragement of producers through improved irrigation and transportation facilities.

Argentine foreign-trade policy is primarily directed toward controlling the flow of exports; and exports of grains, livestock, and meat products are controlled by Government boards. Foreign-trade policy also aims at indirectly controlling the volume of production by influencing the level of export earnings, through manipulation of the exchange rate, official commodity valuations, and export taxes and rebates.

Brazil is mostly self-sufficient in foodstuffs and other agricultural commodities, with the important exception of wheat, imports of which are controlled by a Government-authorized import monopoly. Government market intervention, exchange controls, licensing, and other nontariff barriers to trade are still operative in Brazil, but their relative influence in regulating trade has been reduced by the increased importance of higher duties in the tariff system. In addition to participating in the International Coffee Agreement, which entails production goals assigned to member producers, Brazil has operated its own national programs to control coffee production.

1/ State trading involves government control over importation and exportation. The control can be direct, as through a government agency, or indirect, as through private firms, cooperatives, marketing boards, or other agents of the state.

Venezuela's policy is directed to promoting self-sufficiency in agriculture and its basic regulation provides for import restrictions, price controls, crop incentive subsidies, and export subsidies to promote agricultural development and reduce dependence on food imports. Protectionist actions have generally applied to commodities produced locally, but imports of wheat--a commodity that cannot be economically produced in Venezuela--have been assisted by a preferential exchange rate or by a comparable import subsidy. State trading applies to several import commodities and to the export of rice, in which an export surplus has been achieved in recent years. Tie-in arrangements, whereby importers are required to purchase designated quantities of the local product for each unit of imports, apply to a few products, including dry milk.

Central American Common Market

Economic integration 1/ has advanced in the Central American Common Market (CACM) since 1961, though at an uneven pace, and intra-regional trade in agricultural products has been stimulated. U.S. agricultural exports to the CACM have increased on an absolute basis but through 1967 the U.S. share of the total CACM market remained static. Studies have indicated that the CACM has the potential to become self-sufficient in agricultural production with the outstanding exception of wheat. It will become increasingly difficult for the United States and other extraregional suppliers to export to the CACM those

1/ Economic integration is the coordination of or combining of governmental, business, financial, and other institutions of the individual member countries of an association or common market into larger units which function throughout the common market area.

commodities that can be produced within the region. Further development of the CACM and increasing economic relations with the LAFTA could result in limitations or restrictions on the entry into the CACM of exports from the United States and other countries. By 1969, this trend had already adversely affected CACM imports of cotton from the United States; in the future, closer economic ties with LAFTA could result in reduced imports of U.S. grain by the CACM

COMECON countries

U.S. agricultural trade with COMECON (Council for Mutual Economic Cooperation) countries, the Communist-dominated nations of East Europe (excluding Yugoslavia), has been small. This is due both to certain impediments that have restricted trade and to the fact that there is limited basis for agricultural trade between the United States and East Europe which itself is a major producer of temperate-zone agricultural commodities similar to those grown in the United States. Except for unusual years of poor harvests in East Europe, U.S. exports of agricultural products to that area have been small. However, in 1972, the U.S.S.R. purchased 98 million bushels of U.S. wheat (12 percent of total U.S. wheat exports in 1972), 4.1 million metric tons of U.S. feed grains (15 percent of total U.S. feed grain exports in 1972), and 1 million metric tons of soybeans (8 percent of total U.S. soybean exports in 1972). These sales could well be the precursor of larger exports of animal feed-stuffs to East Europe in view of the general goal of these countries to increase livestock production. Obstacles to increased U.S. exports to East Europe have been reduced, including easing of U.S. Government controls on

commodities permitted to be exported to that area, removal of certain shipping requirements, and relaxation of restrictions on Export-Import Bank financing to permit the Bank to participate in transactions involving East European countries under certain conditions. Certain factors, however, continue to limit U.S. imports from East Europe, including U.S. denial of most-favored-nation tariff rates to most COMECON countries, limited U.S. demand for East Europe's agricultural exports, and the bias of some consumers against products of Communist origin.

Japan

To encourage food production, Japan--the most important single export market for U.S. agricultural products--has granted extensive subsidies to agriculture and has exercised a high degree of control over agricultural imports. Still, imports of agricultural products into Japan have increased markedly and make up more than a fifth of the nation's total imports. Support prices for wheat, barley, and rice have been several times as high as world prices, and the high support price for rice has served to increase production substantially, resulting in a large surplus in recent years. Japan has subsidized the exportation of rice and disposed of it in domestic feed markets at subsidized prices, and reduced rice acreage (through rice acreage diversion payments) in an effort to cut down surplus stocks. Production of wheat and feed grains in Japan has been declining, however, and imports provide by far the larger share of increased consumption requirements.

All agricultural items imported into Japan are classified into three categories for purposes of import control. For items in two of

the categories, automatic approval of necessary foreign exchange or import licenses is provided, but for items in the third category--Import Quota List--import licenses may be withheld. The Japanese Government has been reducing the number of items on its Import Quota List, but a considerable number of agricultural products are still subject to the strict control of the import quota system. Several of Japan's major agricultural imports (including corn and grain sorghum for feeding, cotton, hides and skins, and soybeans--the import duty on which was removed effective April 1, 1972) are free of tariff duty and quantitative restrictions. There is state trading in wheat, barley, and rice, and a Government monopoly controls production, domestic distribution, and foreign trade in tobacco. The Japanese Government is actively pursuing a policy of encouraging imports of agricultural commodities from the Far East, East Africa, and from Australia, in order to diversify sources of supply and to develop markets for Japanese manufactures.

Canada

Canada provides both direct and indirect assistance to its domestic agriculture, including price support for grains (other than corn) and other key farm products and reduced transport costs for wheat and flour to export ports. Reduced transportation costs improve the position of Canadian grain relative to U.S. grain in overseas markets. Price support has been provided mainly through deficiency payments; prices of some commodities are supported through Government purchases. Quantitative import restrictions are maintained on certain grains, grain products, and dairy products produced domestically. Preferential rates

of duty are extended to Commonwealth suppliers; duties on imports of fresh fruits and vegetables vary seasonally.

Control over exports of most wheat and certain other grains is vested in a Wheat Board. The Canadian Government assists exports, particularly of grains, by making credit available to foreign buyers. Subsidy payments have been made to exports of some surplus agricultural products, primarily in the dairy sector; until 1971, all exports of dairy products were subsidized except those consigned to the United States. While Canada is a U.S. competitor in the grain markets of the world, it is an important market for U.S. agricultural products--importing a large number of items not produced locally or produced in insufficient quantities to meet domestic demand. It is also a significant source of U.S. agricultural imports, mainly those related to the meat industries.

Spain

In Spain, production, marketing, and prices of principal agricultural commodities have been regulated by the Government since the early 1940's, with the objectives of maintaining stability in consumer prices; encouraging maximum self-sufficiency, especially in food grains and cotton; and stimulating production for export. Through high support prices, production of wheat has been expanded sufficiently to enable exports to be made in recent years, the difference between the support price and the world market price amounting to a substantial subsidy to Spanish farmers. Support-price relationships, however, have been altered to encourage production of feed grains, and recent agricultural

development plans call for reduced wheat output and increased feed grain output for the rapidly growing livestock and poultry production.

Government foreign-trade policy in Spain is basically protective of agriculture, and agricultural imports are subject to quantitative restrictions applied through licensing and an import quota system. All imports and the manufacture and distribution of tobacco and its products are controlled by a semiofficial agency of the Government. Imports of food grains are made by a state trading agency, and, although imports of feed grains are in private hands, they are subject to licensing and a variable levy.

Spain has a preferential trade agreement with the European Community whereby it receives concessions on citrus and other fresh, preserved, and dried fruits, among other commodities. While Spain was at one time an important recipient of U.S. exports under Public Law 480 programs, it has become a substantial commercial market for U.S. agricultural commodities, particularly soybeans.

Philippine Republic

Agriculture is the most important sector of the Philippine economy, and strong efforts have been made to expand food-crop production to meet the needs of a rapidly increasing population. Use of high-yielding varieties of rice--part of the "Green Revolution"--made the Philippines self-sufficient in rice prior to a recent setback, although need for wheat and corn imports continued. Price-support legislation covers rice, corn, and tobacco. Surpluses of low-grade flue-cured tobacco, accumulated under the price-support program, have been sold in foreign

markets at reduced prices; before higher quality tobacco for blending may be imported, exports of domestic leaf, in specified ratio, must be made (in effect, this is an import quota).

A special trading relationship exists between the Philippine Republic and the United States under the Philippine Trade Agreement Revision Act of 1955, which provides for reciprocal tariff preferences and special U.S. tariff treatment of Philippine sugar, filler and scrap tobacco, and coconut oil until July 4, 1974. In anticipation of the termination of U.S. preferences, the Philippine Government has made efforts to expand trade with countries other than the United States. A sizable share of U.S. agricultural exports to the Philippines have continued to be made under Public Law 480 programs, although the proportion has declined from the average during most of the 1960's.

Australia, New Zealand, South Africa

Australia, New Zealand, and South Africa are major producers and exporters of agricultural products and compete with the United States in world markets. In each of these countries, the Government exerts considerable control over the agricultural economy, and commodity boards generally are responsible for marketing the major export crops. In Australia the price-support program for wheat assures producers a guaranteed price for that used domestically and a lower guaranteed price for a specified quantity of exports. Dairy price support provides subsidies to producers of certain dairy products. A price-support program for tobacco has established an annual marketing quota; the guaranteed price in a recent season was nearly double the comparable

U.S. support price. Both Australia and New Zealand have mixing regulations for tobacco, specifying the use of minimum percentages of domestic tobacco in manufactured products, which, in effect, limit imports.

Price support for dairy products and meat is achieved in New Zealand largely through deficiency payments. Price-support operations of the 21 commodity boards in South Africa involve guaranteed-price plans, pool plans, and surplus-disposal plans. These countries, as well as Australia, regulate exports of principal agricultural products through their commodity boards, extend preferential rates of duty to designated British Commonwealth countries, and maintain bilateral trade agreements that involve agricultural products with third countries, including Japan. South Africa and New Zealand employ import-licensing systems to exercise control over agricultural imports, while Australia relies on mixing regulations, quarantine measures, and duties to limit imports of many farm products. Australia has paid subsidies on milk used for certain processed milk products for export; rebates based on sugar content are paid to exporters of specified fruit products and certain other sugar-containing products, while canned-fruit exports to West Europe are subsidized. South Africa's export prices of corn in most years have been lower than the domestic price, with losses made up from a stabilization fund to which the Government contributes by direct subsidy. U.S. agricultural exports to each of these countries have been relatively small, but U.S. agricultural imports from Australia and New Zealand, predominantly meat, have been substantial.

Recipients of U.S. government-assisted exports

Of the eight principal recipients of exports under U.S. Government programs (principally Public Law 480) examined in this study, two no longer receive U.S. government-assisted agricultural exports: Yugoslavia, all shipments to which are now on a commercial basis, and Egypt (United Arab Republic), which no longer qualifies for U.S. agricultural exports under concessional terms of Public Law 480. Although substantial progress has been made in increasing food production in India and Pakistan, it is likely that there will be continued need for imported foodstuffs in these countries. South Vietnam's need for imported foodstuffs probably will be reduced following the settlement of the war there; postwar, South Vietnam may again become a net exporter of rice. South Korea is making strong efforts to promote its agricultural development, and the extent to which it is successful will determine its future dependence on imports. Recent U.S. agricultural exports to Israel and Taiwan under Public Law 480 programs have constituted a much smaller proportion of total U.S. agricultural exports to these countries than in the early 1960's, and it is likely that the greater share of future exports to these countries will continue to consist of commercial exports.

Part II

United States

As the world's leading exporter of certain agricultural products, the United States depends heavily on exports for the economic well-being of its agriculture. Exports of agricultural products were equivalent to about 15 percent of the value of farm marketing receipts in the period 1965-71. Such crops as wheat, soybeans, corn, cotton, tobacco, rice, and grain sorghum depend on exports for a major or significant market outlet.

The United States is also a major importer of agricultural products; about two-fifths of the imports of such products consist of commodities not produced domestically (or not in significant quantities), and the remaining three-fifths represent products competitive with domestic products. Beginning with 1960, the value of U.S. annual agricultural exports has consistently exceeded that of annual agricultural imports; the excess ranged from about \$980 million in 1969 to \$2.9 billion in 1972, and averaged \$1.7 billion for the 1960-72 period.

Inasmuch as the United States is a principal exporter and importer of agricultural commodities, however, its programs and policies have far-reaching effects on world trade in agricultural commodities. Many of the U.S. policies bearing on its foreign agricultural trade have their origin in domestic agricultural policy--the stabilization of prices of specified farm commodities to protect farm income. Agricultural commodities constituting the larger share by value of U.S.

agricultural production are not price-supported; such commodities are principally livestock and most livestock products and fruits and vegetables. Such major export commodities as wheat, corn, cotton, rice tobacco, soybeans, and grain sorghum are price-supported; a price-support program is also in effect for milk. Price support for the eligible commodities is achieved through Government loans, purchases, and payments to producers. Legislation enacted in 1970 changed the mode of price-support for wheat, cotton, and feed grains to make these commodities competitive in world markets by setting their price-support levels at or near world price levels (for cotton, price-support is at 90 percent of the world price). At the same time, growers' incomes are supplemented by direct payments. This contrasts with earlier programs for these commodities which tended to maintain price-supports above world market levels, necessitating export payments to make exports competitive in international trade.

For many commodities under price-support, production adjustment programs are used to balance supplies with needs and thus to prevent the accumulation of burdensome surpluses. Acreage allotments, marketing quotas for certain crops (if approved by a grower referendum), and acreage diversion programs are means of achieving supply management.

Except for regulations designed to safeguard consumer health and prevent the introduction of plant and animal diseases and pests, there are few U.S. measures that directly affect U.S. imports of agricultural products. To prevent imports from materially interfering with U.S. price-support or other agricultural programs, section 22 of the

Agricultural Adjustment Act of 1933, as amended, authorizes the imposition of import quotas or fees. Only limited use has been made of this provision and currently only certain dairy products, cotton, wheat and wheat flour, and peanuts are subject to import quotas.

Quotas on imports and domestic production of sugar are imposed pursuant to the Sugar Act. The quotas are established by the Secretary of Agriculture for each calendar year based on estimated requirements. Import quotas are necessary because the price of sugar in the United States is substantially higher than the world price. Foreign suppliers have generally provided about one-half of the sugar consumed in the United States. To prevent evasion of the sugar import limitations, imports of certain sugar containing products are restricted by quotas.

In 1964 Congress established a system for imposing restraints on the importation of beef, veal, mutton, and goat meat in fresh, chilled, or frozen form. Specific quantitative limitations on imports could be imposed in any year when the Secretary of Agriculture estimated that imports would otherwise exceed a specified level. Although imports have about doubled since this legislation was enacted, quotas have never been in effect under that act. Certain foreign suppliers undoubtedly were influenced to limit their exports of meat to the United States under bilateral agreements because of the existence of this legislation.

Tariff-rate quotas are maintained by the United States on Philippine coconut oil, Philippine filler and scrap tobacco, certain dairy products, cattle, and potatoes. Such quotas permit specified

quantities of the designated articles to enter at specified rates of duty during a given period; imports in excess of those quantities are subject to higher rates. The tariff rate quota preferences for Philippine coconut oil and filler and scrap tobacco end on December 31, 1973.

U.S. imports of supplementary products (competitive with domestically-produced agricultural commodities) have risen in recent years. Nevertheless, a sizable share of agricultural imports--nearly 40 percent based on value in recent years, representing complementary or noncompetitive imports--enter the United States free of duty and generally free of restrictive barriers.

In addition to measures affecting its agricultural imports, the United States has adopted programs designed to encourage its agricultural exports. The Agricultural Trade Development and Assistance Act (Public Law 480, enacted in 1954 and extended periodically since) authorizes (1) sales of U.S. farm products in exchange for local currencies and long-term dollar and convertible foreign-currency credits, (2) donations and disaster relief, and (3) barter or exchange of agricultural commodities for strategic or other materials to meet U.S. needs. Peak exports under Public Law 480 were made in 1964, when they amounted to \$1.6 billion, 26 percent of the value of total agricultural exports. Since 1964, exports under Public Law 480 program have declined steadily, amounting to about \$1 billion, 14 percent of the total, in 1970, and \$971 million, 13 percent of the total, in 1971. Long-term dollar and convertible foreign currency credit sales have replaced inconvertible foreign currency sales as the chief Public Law 480

export program, in line with the legislative requirement that inconvertible foreign currency sales be phased out by the end of 1971.

Under Agency for International Development (AID) and predecessor programs to assist the economic development of needy countries (assistance for that purpose was also a declared long-term objective of Public Law 480), the United States exported 2.3 billion dollars worth of agricultural products during July 1954-December 1971--2 percent of aggregate U.S. agricultural exports in that period. Agricultural exports under AID programs were substantial from mid-1954 through 1961 but have declined sharply in relative importance since that time.

To enable certain agricultural commodities whose support prices are above world market prices to compete in foreign markets, the United States has maintained export payment programs, under which exporters are compensated for the difference between the domestic price and the lower world price. Sales have also been made to exporters from Government-owned inventories at prices competitive in world markets. In recent years, such programs have assisted approximately half of the exports made under Public Law 480 and AID programs, and about a fifth of the commercial exports (those outside Government programs). U.S. Government expenditures for export payment assistance have declined sharply in recent years with the reduction of support prices for several major export crops (wheat, feed grains, and cotton). Export payments are also authorized under a longstanding special program (section 32, Public Law 74-320) aimed at widening market outlets for surplus agricultural products to strengthen producer prices.

Credits and credit guarantee programs, administered by the Commodity Credit Corporation (CCC) and the Export-Import Bank, have also assisted U.S. agricultural exports. The CCC export credit sales program enables U.S. exporters to meet credit terms offered by foreign competitors; the Exim Bank extends credit to foreign buyers to purchase certain U.S. agricultural commodities when such financing is not available from normal commercial sources. During the period 1960-70, commodities exported under Government credit programs accounted for 4 percent of commercial agricultural exports and 3 percent of total (commercial and Government-assisted) agricultural exports.

If the principal U.S. Government programs assisting agricultural exports--Public Law 480, Mutual Security-AID, export payment programs, and barter shipments for overseas procurement for U.S. agencies--are considered on a combined basis, about 40 percent of aggregate U.S. agricultural exports from mid-1954 through 1971 were made under such programs. Some but not all of these exports probably would have been made in the absence of such programs, but it is not possible to determine what this quantity would have been.

Part III

Impact of restraints on trade in wheat, feed grains, and beef

Part III of the study assesses the impact of various domestic and foreign agricultural and trade measures on the wheat, feed-grain, and beef sectors of U.S. agriculture, with the focus on U.S. trade in these commodities. Attention is also given to the effect of policy changes on net trade flows of the other major producing and importing countries, on prices, production, and consumption, and on gross revenue to U.S. producers. In addition to the United States, individual countries or trading areas included in the analysis are Japan, the European Community, the United Kingdom, Canada, Argentina, Australia, New Zealand, and South Africa. Minor trading nations and Communist countries grouped into four geographic regions are also included, so that coverage is global. No attempt is made, however, to cover the entire feed-livestock complex in the individual countries examined, nor to consider specifically changes in demands of grain-consuming units other than beef cattle in response to changing grain prices.

A feature of the econometric model employed is its capacity to measure interactions among the three commodities. The effects of alternative policies on production, consumption, prices, and net trade flows are ascertained by comparison with a basic model solution for 1967 that incorporates all major policies in existence in that year.

Evaluation of the consequences of 38 alternatives to the agricultural and trade policies existing in 1967 indicates that EC

price-support levels for wheat, feed grains, and beef and U.S. import restrictions on beef have the major effects on U.S. trade. Relative changes in the three EC support prices, however, critically determine the degree of trade effect because of commodity inter-relationships. The model indicates that a reduction of \$15 a ton in EC support prices for wheat and feed grains, with a proportionate reduction in the support price for beef, would lower wheat production in the EC by nearly 1.5 million metric tons, or 5 percent, and would result in lowering its net exports of wheat by nearly 2 million tons, or 77 percent. While a smaller decline in feed-grain production would result, the decrease in production would be nearly matched by reduced consumption, owing to greater use of wheat for feeding, so that only a small increase in EC net imports of feed grains would occur.

The impact of this policy alternative on the United States would depend mainly on the level of permitted U.S. wheat production. Maintaining the original production level would result in a 13-percent increase in price and in gross revenue to wheat producers; permitting wheat production to increase sufficiently to maintain the original price would result in increased U.S. exports of 1.8 million tons (8 percent) and a 5-percent increase in gross revenue to wheat producers. Either way, the impact on U.S. feed grains would be minimal. Further proportionately equal reductions in EC prices for the three commodities would have broadly similar effects on the United States, but unequal reductions in EC support prices would adversely affect the U.S. feed-grain sector, with the adverse effects outweighing the benefits to the wheat sector.

Complete elimination of EC grain and beef price supports results in free-market prices in the EC which are about 20 to 30 percent below the support prices of the basic solution, compared with a range of 17 to 20 percent when grain support prices are reduced by \$15 a ton (with a proportionate reduction in the beef support price). The policy alternative of eliminating EC price supports on grain rather than reducing support prices by \$15 a ton results in somewhat more pronounced effects on EC production, consumption, and net exports. The relative change in beef consumption, however, when EC beef price supports are eliminated rather than reduced, is far greater than in the case of grains. EC beef consumption rises 21 percent upon elimination of support prices, compared with a 13-percent increase when the beef price support is merely reduced. To provide for this increased consumption, net imports of beef into the EC--mainly from Argentina--more than triple the amount shown in the basic solution, rising from approximately 450,000 metric tons (carcass-weight basis) to 1.4 million tons.

A different policy alternative examined the impact on the United States if various changes are made in U.S. restrictions on meat imports. The greatest impact occurs in the unlikely event that all restrictions on beef imports are removed, that is, removal of quantitative limitations, the import duty of 3 cents a pound, and the existing prohibition of unprocessed beef imports from designated areas, notably Argentina. In these circumstances, the model indicates that imports of beef into the United States would double the 1967 amount,

rising to about 1 million metric tons (carcass-weight basis). The indicated increase of a half-million tons is the probable maximum increase in imports that would result from removal of all import restrictions. However, the average quality of U.S. beef is higher than that of imported beef. If an adjustment is made for these quality differences, the rise in U.S. imports would be less than the maximum and total imports would amount to about 945,000 tons, or 82 percent more than in 1967.

If the import duty of 3 cents a pound is retained but the quantitative limitation on meat imports is eliminated, imports of beef adjusted for quality would rise from 518,000 tons in the basic solution to about 735,000 tons, an increase of 42 percent. ^{1/} Thus, the quantitative limitation ("import quota") by itself has the effect of restricting U.S. imports of beef by approximately 215,000 tons. Similarly, the import duty alone has the effect of restricting U.S. beef imports by 210,000 tons (the difference between imports of 945,000 tons when the duty is eliminated and imports of 735,000 tons when the duty is retained).

The rise in U.S. beef imports to 735,000 tons, which results from terminating the quantitative limitation on imports, would cause reductions of 3.5 percent in the U.S. price and 0.7 percent in U.S. production, and an increase of 1.5 percent in U.S. consumption. Total revenue

^{1/} There have been no quantitative limitations on meat imports into the United States since June 26, 1972, when the President suspended the bilateral agreements limiting meat exports of supplying countries to the United States. Responses indicated by the model to changed policies, particularly where beef supply is concerned, must be viewed as long-run responses. Available world supplies of beef in 1972 and 1973 in relation to demand will undoubtedly constrain any increase in U.S. beef imports and imports in 1972 and 1973 should not be expected to increase to the levels indicated by the model.

to the U.S. beef sector would decline by 4 percent. Imports would constitute 7 percent of U.S. beef consumption, compared with 5 percent when imports were fixed in the basic solution. Changes would also occur in trade flows, assuming unprocessed meat imports into the United States are permitted from all areas. Argentina would become the principal supplier of beef to the United States, while Australia and New Zealand would ship principally to the European Community and the United Kingdom, both of which were formerly supplied mainly by Argentina.

The three-commodity analysis indicated only minor effects on the United States of changes in price-support policies in countries outside the EC; of reduction or elimination of foreign import duties; and of the elimination of British Commonwealth preferences, foreign import quotas, export taxes, and diversification policies regarding supply sources or market outlets. Separate country evaluations of the effects of price-support policies for grains in the United Kingdom, Japan, Australia, and South Africa--assuming support prices either reduced or eliminated--indicated relatively little effect on U.S. trade in these commodities, except where support prices are eliminated in the United Kingdom. Because of the structure of the United Kingdom supply and demand equations estimated for the three commodities, elimination of support prices results either in reduced wheat prices in the United States or in a small reduction in exports, depending on the permitted level of U.S. output, but in an increased price and moderately higher exports of feed grains. When price-support policies were evaluated on a combined basis, by simultaneously considering them in all countries

for which prior individual analyses were made, the effect of changed EC support prices on the United States and the world market overshadowed the impact of changed supports in the other countries.

Reduction or elimination of import duties on feed grains would, as indicated by the model, result in appreciable price reductions in most importing areas; however, the effects of these price changes on demand-supply relationships (and hence on trade flows) could not be evaluated since demand-supply functions were not estimated for broad geographic areas because of technical difficulties. Elimination of British Commonwealth preferences resulted in some change in the direction of trade flows in wheat but otherwise had little net effect on the United States or the world market. Elimination of Japan's diversification policy with respect to procurement of grains resulted in a slight realignment of trade flows in wheat but a more substantial change in trade flows in feed grains, with the United States becoming Japan's sole supplier. Similarly, some change in trade flows in wheat occurred upon elimination of Australia's policy of diversifying its export outlets and of New Zealand's requirement of an inspection certificate before admitting foreign-grown wheat; in the latter instance, U.S. wheat is exported to New Zealand to replace a reduction in wheat imports from Australia. The impact of the elimination of Argentina's export taxes on wheat and feed grains was mainly confined to that country.

Elimination of Japan's import quota for beef, either alone or in combination with a reduced or eliminated duty, resulted, as expected,

in lower beef prices and increased consumption in Japan, the increased demand raising prices elsewhere in the world and stimulating production in and exports from Australia and Latin American countries, especially Argentina. These policy alternatives, however, would have only a slight effect on the United States.

An approximation of a free-trade solution of the model was obtained by eliminating all trade barriers examined in previous analyses and price support in all countries; controlled wheat production in the United States was still assumed, however, along with continuation of Public Law 480 programs. Under these circumstances, when U.S. wheat production remained unchanged, little change in U.S. consumption and exports occurred, but a 13-percent increase in price and total revenue to producers resulted; if production was permitted to rise by 9 percent to keep the price unchanged, exports rose 16 percent and total revenue to wheat producers increased 9 percent. Under either option for wheat, increases occurred in prices and exports of feed grains and in total revenue to U.S. producers. In this approximation of free trade, beef imports into the United States (unadjusted for quality differences) increased nearly 25 percent, while there were small declines in price and production and a modest increase in consumption.

An attempt to evaluate the effect of eliminating Public Law 480 shipments rested on an estimate that U.S. exports of wheat in 1967 would have been reduced by 30 percent and exports of feed grains, by 10 percent, in the absence of Public Law 480 programs. The model solutions set two bounds to the consequences of eliminating Public Law 480

programs--one indicating the effects when no adjustment was made in U.S. wheat production and the other indicating the effects when wheat production was reduced sufficiently to maintain the U.S. wheat price at its original level. Under the first option, prices of U.S. wheat and feed grains dropped to support levels; a Government outlay in excess of \$300 million would be required to maintain the market price of wheat at the support level through the removal from the market of excess wheat for storage. With a small reduction in output of feed grains and a small increase in their consumption U.S. exports of feed grains declined an additional 2 percent for a total decline of 12 percent from the level existing when continuation of Public Law 480 programs was assumed. Under the second option--a cutback in U.S. wheat production to maintain its price--wheat output and gross revenue to producers are both reduced 17 percent; the effect on feed grains was similar to that under the first option.

APPENDIX

Description of the econometric model

The framework for analysis is a spatial price equilibrium model. The particular model is that developed by Samuelson, 1/ refined by Takayama and Judge, 2/ and modified by Bawden. 3/ Demand and supply equations are estimated for each of the major importing and exporting countries for each of the three commodities. Interrelationships among the commodities are incorporated where appropriate (e.g., wheat and feed grains often compete for land on the supply side, and feed grains--and sometimes wheat--are inputs into beef production). Minor trading nations (and those for which data are inadequate to estimate demand and supply functions) are grouped into geographic regions, and point estimates of their aggregate production and consumption are made.

Conceptually, these demand equations, plus consumption estimates for geographic regions, are aggregated; the supply equations and production estimates are similarly aggregated. The intersection of the "aggregate" demand and "aggregate" supply represents a world price for each commodity. This, however, abstracts from space and policies affecting trade. The analytical model allows for transfer costs (in-land transportation to docks, loading, ocean transportation, unloading,

1/ Paul A Samuelson, "Spatial Price Equilibrium and Linear Programming," American Economic Review, vol. 42, June 1952, pp. 283-303.

2/ T. Takayama and G.G. Judge, "Equilibrium Among Spatially Separated Markets: A Reformulation," Econometrica, vol. 32, October 1964, pp. 510-524.

3/ D. Lee Bawden, "A Spatial Price Equilibrium Model of International Trade," Journal of Farm Economics, vol. 48, November 1966, pp. 862-874.

inspection fees, and inland transportation to consumption points) and the effect of trade barriers (import duties, quotas, and export taxes) as well as export subsidies, if any. These factors modify the "world price"; producers in exporting country A receive a price which differs from the price paid by consumers in importing country B by the amount of transfer costs plus duties minus subsidies; producer price and consumer price within a country differ by the inland transfer cost from producing to consuming regions.

The equilibrating factor is price; total world production is made to equal total world consumption through the demand and supply equations. The solution yields net trade flows between countries, together with production, consumption, prices, and total revenue for each commodity in each country.

The model is constructed for the year 1967, the most recent year for which statistics were available for all countries when the study was begun. It represents, however, a "normal" year. Stocks are assumed to remain constant, and aberrations caused by such natural factors as adverse weather, disease, or insect infestation are smoothed over by the use of time series data in estimating the demand and supply equations. It is desirable to represent a "normal" year in order to draw implications of average or representative effects of policy changes.

The basic model solution for 1967 incorporates all policies actually in existence in that year. This basic model solution provides a standard with which all other solutions--incorporating specific alternative trade restraints or eliminating existing restraints--are compared.

Effects of such policies are thus measured by the differences from the basic model solution.

The model assumes that exporting nations sell to the highest bidder and consuming regions buy at the lowest available price. While this is an accurate representation of a perfectly competitive trade situation, in actuality other factors are important in trading situations. "Non-optional" purchases or sales may occur for political purposes, under preferential trading arrangements, or for risk aversion--the motivation underlying diversification of supply sources or markets. Diversification of supply sources is handled in the model by setting minimum quantities for trade flows which exist for noneconomic reasons.

Another characteristic of the model is that only net trade flows appear in the solution. Owing to differences in quality of a particular commodity (e.g., wheat) or different product forms (e.g., in beef), some countries buy from and sell to each other, or buy from one country and sell to another. Because the trade flows in the model are net figures, each country can be an importer or an exporter, but not both, unless predetermined trade flows are involved. Although the European Community, for example, is both an importer and exporter of wheat, only its net trade in that commodity is shown in the solutions.

For the purpose of applying empirically the model described above, the world was divided into 13 geographic delineations: the United States, Canada, Australia, Argentina, the European Community, the United Kingdom (including Ireland), Japan, New Zealand, South Africa, Other Africa, Other Europe, Other Asia, and Other America. For the eight individual

countries and the EC, individual demand and supply equations were estimated for each of the three commodities, with the exceptions noted below. Point estimates of production and consumption (1965-67 averages of actual data) were made for the four aggregate regions.

In terms of total trade depicted by the model among the 13 regions, the nine represented by demand and supply equations account for 100 percent and 75 percent of the feed-grain net exports and net imports, respectively, 71 and 30 percent of the beef net exports and imports, and 48 and 16 percent of wheat net exports and imports.

Among the eight individual countries and the EC, equations were not estimated for wheat and feed grains in New Zealand, beef and feed-grain supply in Japan, and beef in South Africa, because the quantities produced or consumed were small relative to world totals. Point estimates were made instead. More important, a point estimate is used for wheat supply in the United States because both production and prices have been subject to Government control for so long that it was impossible to estimate a market relationship between the two. Given these controls, changes in policies by other countries cannot affect U.S. wheat production or floor prices through the market, but only through responses by U.S. policymakers. Therefore, two solutions are derived for each policy alternative. Option A assumes that U.S. wheat production remains constant. In Option B, wheat production in the United States is adjusted just enough to keep the U.S. price at the same level as before the policy change. These two options should place the upper and lower bounds on responses by the U.S. Government to a change in world market conditions. The model cannot predict where, within

these bounds, U.S. wheat production and price objectives would be set by policy makers.

To obtain the solutions, the demand and supply equations developed for individual countries and commodities were "collapsed" so that quantity is a function only of price of one or more of the three commodities. To compute this second set of equations, 1967 values were assigned to the exogenous variables used to derive the original equations. These values were then multiplied by their respective regression coefficients and added to (or subtracted from) the constant term of the original equations to form a new constant. The full equations estimated by regression analysis from time series data (covering the 1950's and extending through 1967) are shown in appendix A of the staff research paper; the production and consumption centers used for estimating transfer costs are shown in appendix B, and data on transfer costs within and among regions, in appendix C of that paper.

