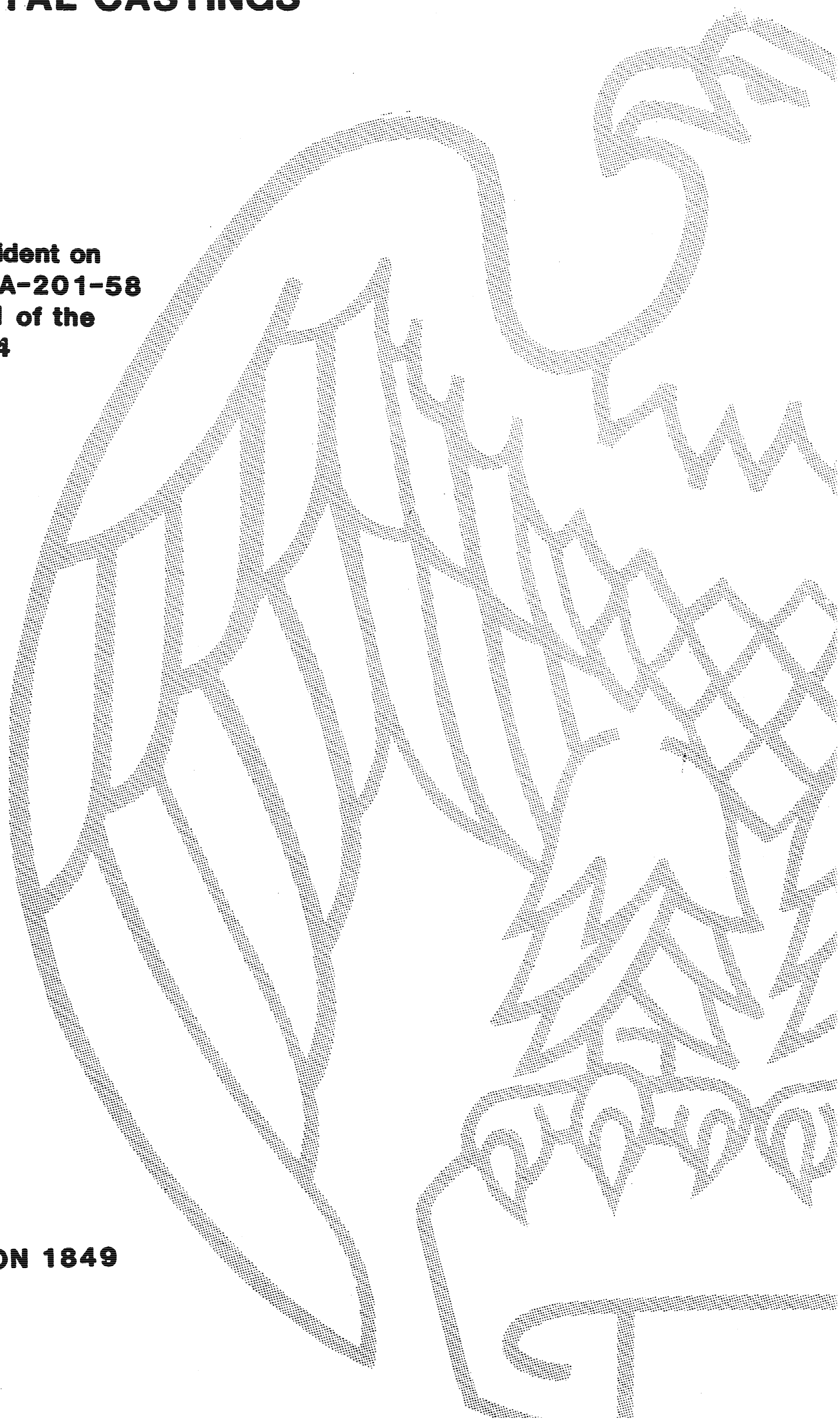
CERTAIN METAL CASTINGS

Report to the President on Investigation No. TA-201-58 Under Section 201 of the Trade Act of 1974



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UNITED STATES INTERNATIONAL TRADE COMMISSION

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CONTENTS

CONTENTS

CONTENTS

CONTENTS

CONTENTS

CONTENTS

CONTENTS

CONTENTS

Tables

CONTENTS

CONTENTS

CONTENTS

CONTENTS

CONTENTS

CONTENTS

Note: Data that would disclose confidential operations of individual concerns may not be published and therefore have been deleted from this report. Deletions are indicated by asterisks.

UNITED STATES INTERNATIONAL TRADE COMMISSION
June 2, 1986

REPORT TO THE PRESIDENT ON INVESTIGATION NO. TA-201-58

CERTAIN METAL CASTINGS

Determinations

On the basis of the information developed in the subject investigation, the Commission has determined that the following metal castings, whether or not advanced beyond cleaning, and whether or not machined beyond the removal of fins, gates, sprues, and risers or to permit location in finishing machinery, are not being imported into the United States in such increased quantities as to be a substantial cause of serious injury, or the threat thereof, to the domestic industries producing articles like or directly competitive with the imported articles: 1/

Iron castings and ductile iron castings:
- Construction castings, specifically, manhole covers, rings, and frames, catch basin grates and frames, cleanout covers and frames, and valve, service, and meter boxes, provided for in items 657.09, 657.10, and 657.25 of the Tariff Schedules of the United States (TSUS);
- Pressure pipe fittings for water mains, provided for in TSUS items 610.62, 610.63, 610.70, 610.71, 610.74, and 610.82;
- Housings for compressors, provided for in TSUS item 661.10; and
- Brake drums and rotors, provided for in TSUS items 692.32 and 692.33.

Steel castings:
- Parts of valves, including the bodies (or "shells"), bonnets, stems, wedges, handles, and seat rings, provided for in TSUS items 680.17, 680.25, and 680.27; and
- Parts for construction equipment, tractors, and trucks, specifically:
  - Axle parts, including housings and spindles, for off-highway heavy construction vehicles, provided for in TSUS item 664.08;
  - Levers for front end loaders and crawler tractors, provided for in TSUS item 664.08;
  - Drive sprockets for track-laying construction machinery and track-laying tractors, provided for in TSUS items 664.08, 692.34, and 692.35;
  - Beam hanger brackets for class 6, 7, and 8 on-highway trucks, provided for in TSUS items 692.32 and 692.33; and
  - Sockets and suspension brackets for 5-ton military trucks, provided for in TSUS item 692.32.

Bronze castings:
- Ship propellers, provided for in TSUS items 657.35, 678.50, and 696.15.

1/ Chairwoman Stern determined that cast-steel beam hanger brackets and sockets and suspension brackets are being imported into the United States in such increased quantities as to be a substantial cause of serious injury, or the threat thereof, to the domestic industries producing articles like or directly competitive with the imported articles. Commissioner Eckes determined that cast-steel parts of valves are being imported into the United States in such increased quantities as to be a substantial cause of serious injury to the domestic industry producing an article like or directly competitive with the imported article. Commissioner Rohr did not participate with respect to cast-iron brake drums and rotors or cast-steel beam hanger brackets.

Background

The Commission instituted the investigation, No. TA-201-58, under section 201(b)(1) of the Trade Act of 1974 (19 U.S.C. 2251(b)(1)), in order to determine whether certain metal castings are being imported into the United States in such increased quantities as to be a substantial cause of serious injury, or the threat thereof, to the domestic industries producing articles like or directly competitive with the imported articles. The investigation was instituted following receipt of a petition on December 2, 1985, as amended on December 12 and December 18, 1985, from the Cast Metals Federation.

Notice of the institution of the Commission's investigation and of a public hearing to be held in connection therewith was given by posting copies of the notice in the Office of the Secretary, U.S. International Trade Commission, Washington, DC, and by publishing the notice in the Federal Register of January 2, 1986 (51 F.R. 130). The hearing was held in Washington, DC, on March 18-19, 1986, and all persons who requested the opportunity were permitted to appear in person or by counsel.

This report is being furnished to the President in accordance with section 201(d)(1) of the Trade Act of 1974. The information in the report was obtained from responses to Commission questionnaires, fieldwork and interviews by members of the Commission's staff, other agencies, information presented at the public hearing, briefs submitted by interested parties, the Commission's files, and other sources.

VIEWS OF THE COMMISSION 1/ 2/ 3/

Introduction and Summary

We determine that imported cast-metal articles covered in this investigation are not being imported into the United States in such increased quantities as to be a substantial cause of serious injury, or the threat thereof, to the domestic industries producing articles like or directly competitive with the imported articles. Having found that the requirements of section 201 of the Trade Act of 1974 4/ are not satisfied, we do not recommend to the President that import relief be provided. 5/

This investigation concerns the effect of imports on industries producing certain metal castings. Based on the information developed during the course of this investigation, we find that the imported articles can be grouped into eleven different categories. 6/ We also find that there are eleven domestic industries producing articles "like or directly competitive with" the subject imports. 7/ Imports of all eleven product categories are increasing. 8/ However, the domestic industries producing construction castings, pipe fittings, brake drums and rotors, and bronze ship propellers are not

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1/ Chairwoman Stern dissents from these views with respect to beam hanger brackets and sockets and suspension brackets.

2/ Commissioner Eckes dissents from these views with respect to steel valve parts and refers to his separate views.

3/ Commissioner Rohr did not participate in this investigation with respect to brake drums and rotors and beam hanger brackets for class 6, 7, and 8 on-highway trucks.

4/ 19 U.S.C. § 2251 ("section 201").

5/ Vice Chairman Liebeler believes that a recommendation that no import relief be provided is a remedy recommendation. However, because the Commission finds that the requirements of section 201(b) are not met, no remedy recommendation should be made.

6/ See pp. 8-9, infra, for the list of the eleven different categories.

7/ Commissioner Brunsdale dissenting. See, infra, n.11.

8/ Vice Chairman Liebeler dissents from this finding with respect to axle parts. See p. 26, infra.

experiencing serious injury and are not threatened with serious injury. We find that the domestic industries producing cast-iron compressor housings, cast-steel valve parts, axle parts for off-highway construction vehicles, beam hanger brackets for class 6, 7, and 8 on-highway trucks, 9/ levers for front-end loaders and crawler tractors, drive sprockets for track-laying construction machinery and track-laying tractors, and sockets and suspension brackets for 5-ton military trucks are seriously injured, 10/ or threatened with serious injury, but that increased imports are not a substantial cause of that serious injury or threat.

Domestic Industry 11/

9/ Chairwoman Stern found that imports of beam hanger brackets are being imported into the United States in such increased quantities as to be a substantial cause of serious injury to the domestic industry.

10/ Chairwoman Stern found that imports of sockets and suspension brackets are being imported in such increased quantities as to present a threat of substantial injury to the domestic industry.

11/ Commissioner Brunsdale agrees fully with the views of the majority in this section, except insofar as these views imply the appropriateness of finding more than seven industries. Even if she had found eleven separate industries and eleven separate imported products, as did the majority, it would not have changed any of her determinations.

Commissioner Brunsdale finds there are seven industries. Six of them are identical to those identified by the majority, and one produces collectively the five following cast steel items investigated by the Commission (in addition to other similar items): (1) axle parts (including housings and spindles) for off-highway heavy construction vehicles; (2) beam hanger brackets for class 6, 7, and 8 on-highway trucks; (3) levers for front-end loaders and crawler tractors; (4) drive sprockets for track-laying construction machinery and track-laying tractors; and (5) sockets and suspension brackets for 5-ton military trucks. Together, these five imported items constitute the product that can be called "vehicular steel castings," which is produced by the domestic "vehicular steel castings industry."

The data available to the Commission on the domestic vehicular steel castings industry cover only those firms that produce at least one of the five items. They are, however, properly indicative of the effect of the subject imports on the performance of the entire industry. Moreover, the fact that the data in this case are limited to those foundries currently producing the like or directly competitive product is not a fatal impediment to reaching

(Footnote continued on next page)

The relevant domestic industry, for purposes of section 201, is that which produces an article "like or directly competitive with the imported article." 12/ The legislative history of the Trade Act of 1974 defines the terms "like or directly competitive" as follows:

> 'like' articles are those which are substantially identical in inherent or intrinsic characteristics (i.e., materials from which make, appearance, quality, texture, etc.), and 'directly competitive' articles are those which, although not substantially identical in their inherent or intrinsic characteristics, are substantially equivalent for commercial purposes, that is, are adapted

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(Footnote continued from previous page)
sound conclusions about the more broadly defined industry. The Commission is reasonably entitled to infer that the portion of the industry that the petitioners have urged it to look at, corresponding in this case to the subsequently developed investigative data, would reflect the domestic industry's best opportunity to persuade the Commission of serious injury and substantial causation.

Though the Commission may choose to define the industry as "only that portion or subdivision of the producer which produces the like or directly competitive article," 19 U.S.C. § 2251(b)(3)(b), it is not compelled by the law to do so and may appropriately consider properly justified broader industry definitions. The majority opinion in this case states that "[I]n determining which producers constitute the domestic industry, the Commission generally has considered the productive facilities, manufacturing processes, and the markets for the products at issue in the investigation." Commissioner Brunsdale notes that all of these factors direct the Commission toward finding a single industry encompassing the five cast steel products above. With respect to productive facilities and manufacturing processes, the best evidence of feasible diversified production is that two of the largest four firms produce non-coincident selections of four of the five products and that several other firms produce two of the five. Memorandum INV-J-094. With respect to markets, the record indicates that the market for each of these products involves vehicle producers as the final customer. Report of the Commission (Report) at II-1-2.

12/ 19 U.S.C. § 2251(b)(1).

> for the same uses and are essentially interchangeable therefor. 13/

Both producers of a like product and producers of a directly competitive product can be part of the domestic industry under section 201.

Petitioner has identified imports from eleven categories of foundry products or groups of products that are allegedly a substantial cause of serious injury, or threat of such injury, to domestic industries producing castings that are like or directly competitive with those imports. Petitioner argues that there are eleven distinct domestic industries producing the like or directly competitive articles. Further, petitioner maintains that we should treat as part of each such industry only that portion or subdivision of the producer that produces the like or directly competitive article. 14/

Several parties in opposition to the petition agree that there are at least eleven domestic industries, or agree with a specific industry definition

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13/ H.R. Rep. No. 571, 93rd Cong., 1st Sess. 45 (1973); S. Rep. No. 1298, 93rd Cong., 2d Sess. 121-22 (1974). Section 601(5) of the Trade Act of 1974 provides as follows:

> An imported article is 'directly competitive with' a domestic article at an earlier or later stage of processing, and a domestic article is 'directly competitive with' an imported article at an earlier or later stage of processing, if the importation of the article has an economic effect on producers of the domestic article comparable to the effect of importation of articles in the same stage of processing as the domestic article. For purposes of this paragraph, the unprocessed article is at an earlier stage of processing.

19 U.S.C. § 2481(5).

14/ Petitioner's Post-hearing Brief at 9 and 32-34. For example, the petitioner would have us measure alleged serious injury caused by imports of levers by reference to discrete portions of facilities, which portions have been allocated to the production of levers, rather than by reference to the overall operations of such facilities.

proffered by petitioner. 15/ Several parties opposed to the petition, on the other hand, have argued that the difficulties in allocating productive facilities militate in favor of making our injury and causation determinations with reference to the entire foundry operations of producers of the subject castings, rather than discrete portions of those operations allocated to production of the relevant castings. 16/ The Commission has, however, obtained sufficient data on the product line basis proposed by the petitioner. 17/

In determining which producers constitute the domestic industry, the Commission generally has considered the productive facilities, manufacturing

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15/ See, e.g., Prehearing Brief of Brazilian Foundry Ass'n. (ABIFA) at 29-30; Prehearing Brief of Korea Foundry and Forging Cooperative Ass'n. (KFFCA) at 6 (eleven domestic industries). See also Post-Hearing Brief of J.I. Case Co. at 1-5 (drive sprockets a separate industry). The fundamental point of departure for most parties in opposition appears to lie with whether specific products should fall within the eleven like or competitive product categories and, thereby, form part of a domestic industry. As an example, a number of parties in opposition argue that "specialty" construction castings should be included within the scope of the relevant domestic industry definition, though such castings were not included in the petitioner's definition. See Post-Hearing Brief of Canadian Foundry Ass'n. (CFA) at 17; Post-Hearing Brief of Ad Hoc Committee at 13; Post-Hearing brief of H. Bowen Co., Inc. at 3. Similarly, parties in opposition argue that there should be separate domestic industries for light iron construction castings and heavy iron construction castings and cast-iron compressor housings products. Pre-Hearing Brief of Ad Hoc Committee at 11; Pre-Hearing Brief of CFA at 16 and 18; Pre-Hearing Brief of CFA at 42. Finally, certain parties in opposition seek inclusion or exclusion of a variety of products from the domestic industries by virtue of their "like" or "directly competitive" nature. See, e.g., id. at 42 (exclude "specialty" steel valve castings); Post-Hearing Brief of ABIFA at 29 (exclude or separate carbon steel and separate carbon steel and stainless steel valve castings); Post-Hearing Brief of Komatsu America Corp. at 2 (exclude spare part imports of cast-steel axle parts and levers); Pre-Hearing Brief of French Foundry Producers Ass'n. at 2 (exclude ductile iron manhole covers and frames); Pre-Hearing Brief of CFA at 28 (exclude machined brake drums and rotors); Pre-Hearing Brief of KFFCA at 12 (include steel valve castings manufactured by the "investment" method).

16/ See, e.g., Post-Hearing Brief of H. Bowen Co., Inc. at 4.

17/ The Commission requested and obtained allocation information from 32 foundries. Vice Chairman Liebeler assumes that these allocations are correct since they make the strongest case for the petitioner.

processes, and the markets for the products at issue. 18/ The facts of this investigation resemble those of the 1983 stainless and alloy tool steel investigation. 19/ Production of castings of different metals in the same facilities is rare, and there exist many differences in production methods and facilities pertaining to the various subject products. Moreover, the subject products are varied in appearance, size, and shape, perform different functions, and, for the most part, are sold in different markets.

Based upon the foregoing considerations, we determine that there are eleven domestic industries producing articles like or directly competitive with the imported products subject to our investigation: (1) iron construction castings (specifically manhole covers, rings and frames; catch basin grates and frames; cleanout covers and frames; and valve service and meter boxes); (2) cast-iron pressure pipe fittings for water mains; (3) cast-iron compressor housings; (4) cast-iron brake drums and rotors; (5) cast-steel valve parts; (6) axle parts (including housings and spindles) for off-highway heavy construction vehicles; (7) beam hanger brackets for class 6, 7 and 8 on-highway trucks; (8) levers for front-end loaders and crawler tractors; (9) drive sprockets for track-laying construction machinery and track-laying tractors; (10) sockets and suspension brackets for 5-ton

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18/ See, e.g., most recently Wood Shakes and Shingles, Inv. No. TA-201-56, USITC Pub. 1826 at 6 (1986).

19/ Stainless Steel and Alloy Tool Steel, Inv. No. TA-201-48, USITC Pub. 1337 (1983). In Stainless Steel and Alloy Tool Steel, the Commissioners unanimously found four separate industries producing (1) stainless steel sheet and strip, (2) stainless steel plate, (3) stainless steel bar and wire rod, and (4) alloy tool steel. Though the Commission recognized that all stainless steel products are interrelated and share certain basic physical properties (for example, a common metallurgical base), it found that the products were produced by different industries since they varied in appearance, size and shape, and were generally produced on different machinery and in different facilities.

military trucks; and (11) bronze ship propellers. We further determine that we should treat as part of these industries only those portions or subdivisions of those producers which manufacture the like or directly competitive products. 20/

Statutory Framework

Having defined the domestic industries, we must address statutory requirements for relief. Before we can make an affirmative determination and recommend import relief, we must find the following:

> (1) that imports of articles concerned are entering the United States in increased quantities;
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> (2) that the domestic industry producing an article like or directly competitive with the imported article is being seriously injured or threatened with serious injury; and
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> (3) that increased imports are a substantial cause of the serious injury or threat thereof to the domestic industry.

After discussing the three statutory requirements, we will apply them to each of the eleven domestic industries.

A. Increased imports.

The first of the three statutory criteria which must be satisfied under section 201 is that of increasing imports. Import increases in either absolute quantities or relative to domestic production satisfy the requirement for increased imports. 21/ 22/ If imports have declined in actual terms,

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20/ 19 U.S.C. §2251(b)(3)(B). See Report at a-5, I-4-5, II-3-5, and III-2-3.

21/ 19 U.S.C. § 2251(b)(2)(1). See also Carbon and Certain Alloy Steel Products, Inv. No. TA-201-51, USITC Pub. 1553 at 24-28 (1984).

22/ Commissioner Brunsdale finds it unnecessary in this case to decide whether a relative increase in market share by itself is sufficient. The only product identified by the majority for which imports decreased absolutely but increased in terms of relative market share is axle parts. Commissioner Brunsdale treats this item as part of a five-item single like product, as explained in n.11.

but at a slower rate than domestic production, imports have increased relative to domestic production and thus, the increased imports criterion has been satisfied. 23/ The statute is silent with respect to the period of time during which imports are to have increased; however, the Commission generally examines the rate of imports over the most recent 5-year period.

B. Serious injury, or threat of serious injury.

The domestic industry must be seriously injured or be threatened with serious injury. The terms "serious injury or threat thereof," are not expressly defined in the statute, but instead are defined in terms of economic factors which the Commission is directed to take into account. In determining whether an industry is seriously injured, the Commission is directed to take

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23/ The specific language "actual or relative to domestic production" is contained in 19 U.S.C. § 2251(b)(2)(c), a provision that addresses the question of substantial cause. In Carbon and Certain Alloy Steel Products, Inv. No. TA-201-51, USITC Pub. 1553 at 24-28 (1984), we found that the language is equally applicable to the issue of increased imports.

Vice Chairman Liebeler believes that the threshold question in section 201 cases is limited to whether imports have increased in absolute amount (in appropriate cases the requirement may be satisfied by an absolute increase in the value of imports). The clear language of the statute requires the Commission to "determine whether an article is being imported into the United States in such increased quantities as to be a substantial cause of serious injury, or threat thereof . . . ." 19 U.S.C. 2251(b)(1) (1980) (emphasis added). When Congress wanted the Commission to consider the relative share of imports, it used precise language to convey its intent:

> (C) with respect to substantial cause, an increase in imports (either actual or relative to domestic production) and a decline in the proportion of the domestic market supplied by domestic producers.

19 U.S.C. 2251(b)(2)(C) (1980) (emphasis added). Once an absolute increase in imports has been found, the Commission can examine both the absolute and relative amounts of the increase to determine whether the increased quantity of imports has been a substantial cause of serious injury. For example, a given absolute increase will normally have a larger impact in a shrinking market than in a growing market. For a more complete discussion, see Wood Shakes and Shingles, Inv. No. TA-201-56 at 45-59 (Views of Vice Chairman Liebeler and Commissioner Brunsdale) (Commissioner Brunsdale reserved judgment on the issue, id. at 46 n.11).

into account all economic factors it considers relevant, including, but not limited to, the following:

> the significant idling of productive facilities in the industry, the inability of a significant number of firms to operate at a reasonable level of profit, and significant unemployment or underemployment in the industry. 24/

In determining whether there is a threat of serious injury, the Commission is to take into account all economic factors it considers relevant, including, but not limited to, a decline in sales, a higher and growing inventory, and a downward trend in production, profits, wages, or employment (or increasing underemployment) in the domestic industry. 25/ The Commission has required that the threat be "real rather than speculative" and that serious injury be "highly probable in the foreseeable future." 26/

Among the factors, other than those specifically noted by Congress, that the Commission has taken into account in prior cases in assessing a threat of serious injury are excess capacity in the exporting countries, 27/ the fact that there is no domestic market for the product in the exporting

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24/ 19 U.S.C. § 2251(b)(2). S. Rep. No. 1298, 93rd Cong., 2d Sess. 121 (1974).

Vice Chairman Liebeler notes that the Commission recently unanimously stated that serious injury required "[a]n important, crippling, or mortal injury, one having permanent or lasting consequences." Electric Shavers and Parts Thereof, Inv. No. TA-201-57, USITC Pub. 1819 at 8 (1984). Vice Chairman Liebeler views this definition as consistent with a major contraction of a domestic industry or its extinction. See Nonrubber Footwear, Inv. No. TA-201-50, USITC Pub. 1545 at 32 (1984) (Views of Vice Chairman Liebeler).

25/ 19 U.S.C. § 2251(b)(2).

26/ Nonrubber Footwear, Inv. No. TA-201-50, USITC Pub. 1545 at 19 (1984).

27/ See, e.g., Stainless Steel and Alloy Tool Steel, Inv. No. TA-201-51, USITC Pub. 756 (1976) at 11 (Opinion of Commissioners Moore and Bedell).

country, 28/ a sudden increase in imports or a strong upward trend in imports, 29/ high inventories maintained by importers, 30/ and a downward trend in prices of imports. 31/ It has been pointed out that although the threat of injury analysis requires an assessment of future events, "the fundamental statutory tests of injury and causation are no less rigorous." 32/

C. Substantial cause.

Substantial cause is defined as "a cause which is important and not less than any other cause." 33/ We must therefore (1) identify other potential causes of injury, and (2) determine whether any cause has a "more important" injurious effect on the condition of the domestic industry than increased imports. 34/ The statute further provides that the Commission, in considering the issue of causation, is to take into account all economic factors which it considers relevant, including but not limited to "an increase in imports (either actual or relative to domestic production) and a decline in the proportion of the domestic market supplied by domestic producers." 35/

28/ See Heavyweight Motorcycles and Engines and Power Train Subassemblies Therefor, Inv. No. TA-201-47, USITC Pub. 1342 at 14 (1973) (Views of Chairman Eckes) (Motorcycles of more than 750cc could not legally be sold in Japan).

29/ Mushrooms, Inv. No. TA-210-17, USITC Pub. 708 at 13-14 (1977).

30/ Heavyweight Motorcycles and Engines and Power Train Subassemblies Therefor, supra, at 13 (Views of Chairman Eckes). ("[P]rimary factor underlying threat of injury to this industry consists of importers' and dealers' inventories.") Commissioner Stern, however, considered the large inventories to be the result of an overly optimistic demand forecast, and predicted that liquidation of inventories would result in a reduction in imports. Id. at 73.

31/ Honey, Inv. No. TA-201-14, USITC Pub. 781 at 11 (1976).

32/ Heavyweight Motorcycles and Engines and Power Train Subassemblies Therefore, supra, at 70 (Views of Commissioner Stern).

33/ 19 U.S.C. § 2251(b)(4).

34/ See Inv. No. TA-201-48 at 47.

35/ 19 U.S.C. § 2251(b)(2)(c).

The Senate Report on the Trade Act discusses the substantial cause standard and the Commission's analysis as follows--

> The Committee recognizes that 'weighing' causes in a dynamic economy is not always possible. It is not intended that a mathematical test be applied by the Commission. The Commissioners will have to assure themselves that imports represent a substantial cause or threat of injury, and not just one of a multitude of equal causes or threats of injury. It is not intended that the escape clause criteria go from one extreme of excessive rigidity to compete laxity. An industry must be seriously injured or threatened by an absolute increase in imports, and the imports must be deemed to be a substantial cause of the injury before an affirmative determination should be made.
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> * * * *
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> With respect to threat of serious injury, the Commission should consider a decline in sales, a higher and growing inventory, and downward trend in production, profits, wages, or employment (or increasing underemployment) in the affected domestic industry. The existence of any of these factors such as the growth in inventory would not in itself be relevant to the threat of injury from imports if it resulted from conditions unrelated to imports. Such conditions could arise from a variety of other causes, such as changes in technology or in consumer tastes, domestic competition from substitute products, plant obsolescence, or poor management. It is the intention of the Committee that the threat of serious injury exists when serious injury, although not yet existing, is clearly imminent if imports trends continued unabated. 36/

Industry-By-Industry Analysis

In the present investigation, we are unable to find serious injury, or a threat of such injury, with respect to domestic industries producing iron construction castings, pressure pipe-fittings for water mains, cast-iron brake drums and rotors, and bronze ship propellers. Because we have determined that these industries are not seriously injured or threatened with serious injury, we do not need to address the issue of causation.

36/ S. Rep. No. 1298, 93rd Cong., 2d Sess. 120-21 (1974).

We determine that the domestic industries producing iron compressor housings, steel valve castings, axle parts, 37/ beam hanger brackets, levers, drive sprockets, and sockets and suspension brackets for military trucks are being seriously injured or threatened with serious injury. With respect to these industries, we have determined that increased imports are not a substantial cause of serious injury, or threat thereof.

1. Construction castings.

The iron construction castings covered by this investigation include manhole covers, rings, and frames; catch basin grates and frames; cleanout covers and frames; and valve, service, and meter boxes. These articles are cast primarily from gray iron, but are occasionally cast from malleable or ductile iron. 38/ This investigation 39/ covers gray, ductile and

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37/ Since imports of axle parts have not increased in absolute terms, Vice Chairman Liebeler does not examine the issues of injury or causation.

38/ Gray iron has the majority of its carbon or graphite content in the form of flakes which are interspersed throughout the metal. Gray iron products are brittle, having little or no ductility, but they have good wear resistance and high vibration absorption and can be machined easily. The graphite content of ductile iron is present in modular or spheroidal form. Products are made of ductile iron when reduced brittleness and increased strength is required. Malleable iron has the majority of its graphite in irregularly shaped nodules and, unlike the other forms of cast iron, requires annealing by heating rapidly to 1,750°F and then cooling, to achieve the graphite configuration and the desired ductility, hardness, and other properties required in the cast product. See Report at I-1.

39/ There is a difference in the product definition for the construction castings included within the scope of this investigation and those subject to several recent title VII investigations. All manhole covers, rings and frames, all catch basin grates and frames, and all cleanout covers and frames if made of iron and classified in the applicable tariff items are included in this investigation regardless of the amount of special machining that has been accomplished. The title VII investigations covered standard items and excluded "specials," such as lock-down and water-tight manhole covers. Id. at I-2.

malleable iron castings, and both "light" and "heavy" castings. 40/

Increased imports--Imports of construction castings more than tripled during the period covered by our investigation, from 20,682 tons in 1981 to 77,763 tons in 1985. 41/ In relative terms, the ratio of construction casting imports to U.S. production increased from 12.7 percent in 1981 to 36.6 percent in 1985. 42/ Imports have thus increased in both real and relative terms.

Serious injury or threat thereof--We are unable to find serious injury, or threat thereof, to the domestic industry. U.S production of construction castings declined from 162,313 tons in 1981 to 150,375 tons in 1982, but then increased to 212,571 tons in 1985. 43/ During the same period, U.S. capacity rose from 368,375 tons in 1981, to 455,184 tons in 1985. 44/ Though capacity utilization fluctuated during the period, there was an overall increase in capacity utilization from 44.4 percent in 1981 to 46.7 percent in 1985. 45/ U.S. producers' shipments of construction castings also

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40/ "Light" construction castings typically have 1/4 inch thick walls and generally range in weight from 10 to 120 pounds. The light construction castings covered by our investigation were valve, service, and meter boxes. These products are used to encase the underground valves and meters of water, gas, or other utilities, and to provide access to this equipment for periodic adjustment or reading. Id. at I-1. "Heavy castings" usually have walls of 1 inch or greater thickness and generally range in weight from 270 to 1,000 pounds. The heavy construction castings covered in our investigation consisted of manhole covers, rings, and frames; catch basin grates and frames; and cleanout covers and frames. These products are used for drainage or access purposes in utility, water, and sanitary systems. Manhole sets, consisting of a cover and a frame, and sometimes accessory parts such as rings, constitute the bulk of both domestic production and imports of heavy construction castings. Id.

41/ Id. at I-17, table I-4.

42/ Id. at I-18, table I-5.

43/ Id. at I-20, table I-6.

44/ Id.

45/ Id. at I-21, table I-6.

increased, 46/ and inventories of construction castings remained stable in actual terms, and declined relative to domestic production. 47/

After an initial decline in 1982, the average number of production and related workers producing construction castings rose steadily, and was greater in 1984 and 1985 than it had been in 1981. 48/ The same trend occurred with respect to hours worked by workers producing construction castings, and with respect to wages and total compensation paid to such workers. 49/

During the period of investigation, the financial experience of U.S. producers has been positive. Aggregate net sales of construction castings declined slightly from $101.3 million in 1981 to $100.4 million in 1982, but then increased by 31 percent to $131.5 million in 1984. During the interim periods investigated, sales grew from $109.3 million in 1984 to $116.0 million in 1985. 50/ Both operating income and the operating margin increased after slight declines in 1982. 51/ Further, the fundamental financial position of the overall and divisional operations of U.S. producers remained stable, and improved by some measures. Total assets, as well as equity, increased during the period covered by our investigation while total liabilities remained virtually unchanged throughout 1981-85. 52/ 53/

46/ Id. at I-24, table I-7. Though shipments decreased from 158,352 tons in 1981 to 152,426 tons in 1982, shipments increased to 170,599 tons in 1983, 197,738 tons in 1984, and 208,544 tons in 1985. Id.
47/ Id. at I-26, table I-9.
48/ Id. at I-28, table I-10.
49/ Id.
50/ Id. at I-34, table I-14.
51/ Id.
52/ Given our definition of the domestic industry against which we are measuring injury, balance sheet and financial ratios for the overall operations of producers are not as useful as such data would be if the domestic industry were defined as the overall operations of all producers. Such data are, however, among the many indicators we examine in this investigation in determining whether the domestic industry is experiencing serious injury, or threat of serious injury.
53/ Report at I-38, table I-17.

Despite an increase in imports, the performance of the domestic industry has been improving since 1982, as indicated by rising production, employment, and sales. Moreover, year-end inventories of imported construction castings relative to imports have been trending downward during 1981-85. 54/

These considerations lead us to conclude that the domestic industry is not experiencing serious injury, or threatened with serious injury, by reason of increased imports of construction castings.

2. Pressure pipe fittings for water mains ("pipe fittings").

Water main pressure pipe fittings are made principally from gray and ductile iron, and are used to join pipes, to change the direction or diameter of pipe, or to provide access for cleaning. 55/ These fittings are used in water distribution systems that deliver water from water authorities to homes, commercial buildings, and other facilities. Pipe fittings with dimensions that range from two to 54 inches are manufactured as standard production items, and pipe fittings larger than 54 inches can be produced on special order by some foundries. 56/ Though gray iron was until recently the metal most often used for casting pipe fittings, ductile iron is increasing in popularity due to its lighter weight and higher tensile strength. Gray and ductile iron fittings are, however, usually interchangeable, and both are covered in this investigation. 57/

Increased imports--U.S. imports of cast-iron pipe fittings have increased in both absolute and relative terms. Imports increased from 1981 levels to

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54/ *Id*. at I-62, table I-31.
55/ *Id*. at I-2.
56/ *Id*.
57/ *Id*. at I-2-3.

4,148 tons in 1982, and then to 10,594 tons in 1985. The average imports-to-production ratio for pipe fittings increased from 1981 levels to 4.3 percent in 1982, and then to 8.6 percent in 1985. 58/

Serious injury or threat thereof—The domestic cast-iron pipe fittings industry is not seriously injured, or threatened with serious injury. Though production fluctuated during the period covered by our investigation, production levels in 1984 and 1985 were well above levels reached in 1981. 59/ Capacity utilization levels in 1984 and 1985 were also higher than levels reached in 1981. 60/ Domestic shipments of pipe fittings declined from 99,736 tons in 1981 to 93,168 tons in 1982, but then rose steadily and reached 120,729 tons in 1984 before declining slightly to 116,842 tons in 1985—a figure well above 1981 and 1982 levels. 61/ Inventories of pipe fittings remained relatively constant throughout the period under investigation. 62/ Though there was an irregular decline in the average number of production and related workers producing pipe fittings, the decline was insubstantial—particularly so in this case because output per 1,000 hours worked by production and related workers producing fittings increased by 28 percent between 1981 and 1984. 63/ Wages and total compensation paid to production and related workers increased by 36 percent from 1982 to 1985, after dipping by three percent in 1982. 64/

58/ Id. at I-17, table I-4; and I-18, table I-5.
59/ Id. at I-20, table I-6.
60/ Id. at I-21, table I-6.
61/ Id. at I-24, table I-7.
62/ Id. at I-26, table I-9.
63/ Id. at I-27. Output per 1,000 hours worked by production and related workers declined by one percent in 1985. Id.
64/ Id.

The financial performance of U.S. producers of pipe fittings during the period covered by our investigation was good. Aggregate net sales of pipe fittings declined from $122.4 million in 1981 to $118.0 million in 1982, or by 4 percent, and then increased annually, reaching $162.2 million in 1985. [65/] A decline in operating income was reported from $11.3 million in 1981 to $5.8 million in 1982, and an operating loss of $749,000 was reported in 1983. [66/] Likewise, cash flow from operations decreased from $13.2 million in 1981 to $1.5 million in 1983. [67/] Both trends reversed themselves, however, and producers reported an aggregate operating income of $8.1 million in 1984, and $10.8 million in 1985, as well as positive cash flow from operations of $10.9 million in 1984, and $13.4 million in 1985. [68/] Moreover, on their overall or divisional operations, U.S. producers are showing an increase in total current assets; property, plant and equipment; and equity as well as a decrease in long-term debt and current liabilities. [69/] The current ratio increased, and debt to equity ratio declined throughout the period covered by our investigation. [70/]

Despite an increase in imports, the performance of the domestic industry has been particularly strong in 1984 and 1985, as indicated by high production, capacity utilization, shipments, and sales. Moreover, year-end inventories of imported pipe fittings have been stable during 1981-85. [71/] The indicators examined lead us to conclude that the domestic industry is not

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65/ *Id*. at I-40.
66/ *Id*.
67/ *Id*.
68/ *Id*. at I-41, table I-18.
69/ *Id*. at I-45, table I-21.
70/ *Id*.
71/ *Id*. at I-62, table I-31.

experiencing material injury, or threatened with serious injury, by reason of increased imports of pipe fittings.

3. Cast-iron compressor housings.

The cast-iron housing of a compressor contains, supports, and/or anchors the compressor's operating parts, such as the compressor's gears, bearings, and pistons. 72/ Some compressors, commonly known as hermetically sealed compressors, have a pressed steel exterior housing which surrounds the assembled compressor, including the cast-iron interior housing. 73/ Pressed steel exterior housings are not covered in this investigation.

A cast-iron compressor housing may be a single casting, or may be cast in several pieces. Compressor housings range in weight from 10 to 200 pounds, for certain refrigeration and air conditioning compressors, to many thousands of pounds for certain air and gas compressors. 74/ Cast-iron compressor housings are usually made of gray iron. 75/

Increased imports—U.S. imports decreased by 62 percent from 1,876 tons in 1981 to 720 tons in 1983, and then tripled to 2,168 tons in 1985. 76/ The ratio of imports to domestic production declined from 1.7 percent in 1981 to 0.8 percent in 1983 before rising to 2.6 percent in 1985. 77/ There are thus increasing U.S. imports of compressor housings in both absolute and relative terms.

72/ Id. at I-3.
73/ Id.
74/ Id.
75/ Id.
76/ Id. at I-17.
77/ Id. at I-18, table I-5.

Serious injury or threat thereof--The domestic industry is seriously injured. In contrast with domestic industries producing other iron castings covered by our investigation, domestic production and shipments of compressor housings decreased during the period covered by the investigation. U.S. production of compressor housings decreased from 107,447 tons in 1981 to 73,505 tons in 1982, or by 32 percent, and increased to 116,141 tons in 1984. Production then declined by 29 percent to 81,979 tons in 1985. 78/ Shipments fell from 106,911 tons in 1981 to 74,564 tons in 1982, increased to 114,776 tons in 1984, and then declined by 29 percent to 81,874 tons in 1985. 79/ Capacity utilization decreased over the period from 55.3 percent in 1981 to 42.9 percent in 1985. 80/ But for 1984, during which there was some expansion, the average number of production and related workers producing compressor housings, as well as hours worked by these workers, and wages and total compensation paid to these workers, fell throughout the period covered by the investigation. 81/

Net sales fluctuated during the period, but showed signs of substantial decline in the interim period ending December 31, 1985. 82/ In 1982 and the interim period ending December 31, 1985, the domestic industry operated at a net loss and suffered negative cash flow and operating losses. 83/ On their overall or divisional operations, producers reported that the current ratio decreased, and the debt to equity ratio increased during the period covered by our investigation. 84/ Total liabilities more than doubled. 85/

78/ Id. at I-22.
79/ Id. at I-25.
80/ Id. at I-22.
81/ Id. at I-27.
82/ Id. at I-47, table I-22.
83/ Id.
84/ Id. at I-52, table I-25.
85/ Id.

Production, shipments, capacity utilization, and employment all declined. For the period as a whole, sales, net income, and operating income were low. We therefore conclude that the domestic industry producing compressor housings is seriously injured.

Substantial cause—Having found increasing imports, and serious injury or threat thereof, we must determine whether the increasing imports are a substantial cause of such injury or threat. The share of the U.S. market accounted for by imports of compressor housings was small during 1981-85, ranging from 0.8 percent in 1983 to 2.6 percent in 1985. 86/ In the year when the domestic industry showed the greatest level of injury, 1982, the ratio of imports to consumption was at its second lowest point, only 1.3 percent. 87/ There appears to have been no relationship between injury and the level of imports, and minimal—if any—relationship between increasing imports and pricing. 88/ Given the low levels of imports of compressor housings, we conclude that imports had a negligible impact, if any, on the domestic industry. Arguably, increasing imports are not even an important cause of serious injury, or threat thereof, much less a cause which is equal to, or greater than, any other cause. 89/

There are more important causes of injury to the domestic industry than increasing imports of compressor housings. Increasing imports of completed compressors have adversely affected sales of domestically produced compressors during the period under investigation, and dampened demand in end-use markets

86/ Id. at I-62, table I-32.
87/ Id.
88/ See Id. at I-73-78.
89/ Commissioner Eckes concludes that increasing imports of compressor housings are not an important cause of the serious injury he has found, and does not join the conclusions concerning other causes of injury to this industry.

for domestically produced compressor housings. The real value of U.S. imports of completed compressors increased by approximately 125 percent during 1981-85, and the share of the compressor market accounted for by imports nearly doubled during this period. 90/ A significant drop in U.S. exports of compressors has also reduced demand for domestic compressor housings. 91/ We determine that increased imports are not a substantial cause of serious injury, or threat thereof, to the compressor housing industry. There are more important causes of the serious injury being experienced by the domestic industry than increased imports of compressor housings. 92/

4. Brake drums and rotors. 93/

Increased imports—Imports of the cast-iron drums and rotors subject to this investigation more than tripled, from 26,866 tons in 1981, to 91,137 tons in 1985. 94/ The imports-to-production ratio has also increased from 5.5 percent in 1981 to 14.7 percent in 1985. 95/

Serious injury or threat thereof—We find that the domestic brake drum and rotor industry is not seriously injured or threatened with serious injury. Production, capacity utilization and shipments all increased, though

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90/ Report at I-85.
91/ The real value of U.S. compressor exports declined by approximately 44 percent during the period covered by the investigation. Id. at I-86.
92/ Vice Chairman Liebeler finds decreased demand for compressor housings to be a more important cause of injury to the domestic industry than increased imports, and therefore increased imports are not a substantial cause of serious injury. For an explanation of her causation analysis, see Additional Views of Vice Chairman Liebeler and Commissioner Brunsdale which follow.
93/ Commissioner Rohr did not participate in the investigation as to this product.
94/ Report at I-17, table I-4.
95/ Id. at I-18, table I-5.

somewhat erratically, over the course of the period covered by the investigation. U.S. production of cast-iron brake drums and rotors decreased from 487,733 tons in 1981 to 428,559 tons in 1982, but then increased to 679,912 tons in 1984. Production then declined somewhat in 1985, but only to 618,496 tons—a level well above that reached in 1981, 1982 or 1983. 96/ Capacity utilization rose steadily, after a dip in 1982, from 50.4 percent in 1981 to 63.7 percent in 1985. 97/ The trend in shipments paralleled the trend in production, and increased from 479,840 tons in 1981 to 607,414 tons in 1985. 98/ Though fluctuations occurred during the period covered by our investigation, the average number of production and related workers producing brake drums and rotors, as well as hours worked by such workers, and wages and total compensation paid to them, were at higher levels in 1985 than they had been in 1981, 1982 or 1983. 99/

The financial experience of the U.S. industry has been positive. Total net sales declined from $202.1 million in 1981 to $188.3 million in 1982 before surging to $289.6 million in 1984. Though sales were lower in the interim period ending December 31, 1985, than sales in the interim period ending December 31, 1984, sales in the most recent interim period were still well above sales in 1981 and 1982. 100/ Net income and aggregate operating income have followed the same trend. Though net income and aggregate operating income were down in the interim period ending December 31, 1985, they were still at higher levels than in 1981 and 1982. 101/

96/ Id. at I-20, table I-6.
97/ Id. at I-21, table I-6.
98/ Id. at I-24, table I-7.
99/ Id. at I-31, table I-13.
100/ Id. at I-53.
101/ Id.

Though there are some signs of financial decline in 1985 from 1984 levels, 1985 levels of employment, production, shipments, capacity utilization, total net sales, income, and positive cash flow are all well above levels reached in 1981 and 1982. Despite an increase in imports, the performance of the domestic industry has been improving during the period covered by our investigation as indicated by rising production, shipments, employment, capacity utilization, and sales. Moreover, year-end inventories of imported brake drums and rotors have been relatively stable during 1981-85. 102/ These considerations lead us to conclude that the domestic industry is not seriously injured, or threatened with serious injury, by reason of increased imports of brake drums and rotors.

5. Axle parts for off-highway heavy construction vehicles ("axle parts"). 103/

The cast-steel axle parts covered in our investigation include axle housings and spindles, which house the drive gears, and axles, which transmit

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102/ Id. at I-60.

103/ See, supra, n.11 with respect to the difference between the majority's definition of the industries producing products 5, 6, 7, 8, and 9, and the single industry Commissioner Brunsdale finds to be producing vehicular steel castings.

Commissioner Brunsdale finds that the single industry producing these five (and other similar) items is seriously injured, but that an increase in imports was not a substantial cause, as great as any other cause, of such injury. Though there are differences in product and industry definitions between the majority and Commissioner Brunsdale, she agrees with the majority that the decrease in domestic demand is more important than an increase in imports in causing the serious injury currently suffered by beam hanger brackets, drive sprockets, levers, and axle parts. The majority's conclusion is based on facts resembling those pertaining to the vehicular steel castings industry. The reasoning that links those facts to the conclusions is obscure, however, and also necessarily makes several implicit assumptions about the nature of the imports and the substitutability between the imports and the domestic product. A full explanation of Commissioner Brunsdale's reasoning is contained in her Additional Findings and in the Additional Views of Vice Chairman Liebeler and Commissioner Brunsdale.

the motive power to the wheels of the vehicle. These castings range in weight from approximately 150 pounds to 5,000 pounds and are used in off-highway heavy construction vehicles. In assembly, the axle housing is attached to the vehicle chassis with the rear wheels and internal gearing. 104/

Increased imports--Imports of axle parts are the only articles under investigation which experienced a decline in the absolute volume of imports over the period covered by our investigation. Imports of axle parts fell from almost 2,000 tons in 1981 to 854 tons in 1982. After increasing to 1,767 tons in 1984, the absolute volume of imports declined to 1,649 tons in 1985. In the absence of an increase in the absolute volume of imports, the statutory requirement of increased imports is satisfied if there is an increase in imports relative to domestic production. 105/ Because the ratio of imports to production has increased during the period covered by this investigation, 106/ we determine that the first statutory requirement--increased imports--is satisfied with respect to axle parts.

Serious injury or threat thereof--Production of axle parts fell from 14,301 tons in 1981 to 8,012 tons in 1982, and again in 1983 to 7,052 tons. 107/ Though production rose to 12,210 tons in 1984, production then fell to 10,651 tons in 1985. Production never reached 1981 levels during the period of 1982-85. 108/ Likewise, capacity utilization fell from 52.8

104/ Id. at II-1.
105/ See p. 10, supra. Since imports have not increased in absolute volume, Vice Chairman Liebeler finds that the increased imports' requirement is not met with respect to axle parts and, therefore makes a negative determination with respect to axle parts.
106/ Report at II-19, table II-4.
107/ Id. at II-21, table II-5.
108/ Id.

percent in 1981 to 26 percent in 1983. Though capacity utilization rose to 46.2 percent in 1984, capacity utilization then fell to 36.2 percent in 1985. At no time in the period of 1982-85 did capacity utilization reach 1981 levels. 109/ U.S. producers' shipments of axle parts followed the pattern found in production and capacity utilization; shipments fell in 1982 and 1983, and, though shipments increased in 1984 (before declining in 1985), shipments never reached 1981 levels during the period of 1982-85. 110/ The number of production and related workers producing axle parts decreased irregularly between 1981 and 1985, and the number of production and related workers employed in 1984 and 1985 was well below the number of such workers employed in 1981 and 1982. 111/ The hours worked by production and related workers, as well as wages and total compensation paid to such workers, fell irregularly during the period covered by our investigation. 112/

The financial experience of U.S. producers of axle parts has been negative. Sales declined during the period of investigation from $19.5 million in 1981 to $10.1 million in 1983. 113/ Though sales increased in 1984 to $18.0 million—a level still below that of 1981—they then declined to $14.7 million in 1985. 114/ The industry reported aggregate operating losses, negative operating margins and net losses for each year of the period covered by this investigation, but for 1984. 115/ On their overall or divisional operations, U.S. producers reported that total assets and equity

109/ Id. at II-22, table II-5.
110/ Id. at II-25, table II-6.
111/ Id. at II-29, table II-8.
112/ Id.
113/ Id. at II-38, table II-14.
114/ Id.
115/ Id.

have declined during the period covered by our investigation. 116/ Return on investment declined from a slight positive return in 1981 to a high negative return in 1982. The negative return on investment declined during 1983-84, and rose again in 1985. 117/ The negative production, shipment, employment, and financial data found show that the domestic industry is seriously injured.

Substantial cause—Import penetration has been relatively constant throughout 1981-85. In 1982 and 1983, the years in which domestic consumption was at its lowest level during the period covered by our investigation, import penetration was also at its lowest level. 118/ The ratio of imports to apparent consumption ranged between 9.2 percent in 1982, and 13.4 percent in 1985. 119/ The import share in 1985 is only 1.3 percentage points higher than in 1981. 120/

Not only has import penetration been stable, but we have identified other causes of serious injury that have had a more important effect on the condition of the domestic industry than increased imports. The production of axle parts is closely tied to the sale of construction machinery production in the United States. 121/ During 1982-83, the U.S. market for construction machinery, including front-end loaders, crawler tractors, excavators, bulldozers, and other earth-moving machinery was depressed as a result of low

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116/ Id. at II-43, table II-17.
117/ Id. at II-41.
118/ Report at II-74, table II-39.
119/ Id.
120/ Commissioner Eckes concludes that increasing imports of axle parts are not an important cause of the serious injury he has found, and does not join the conclusions concerning other causes of injury to this industry.
121/ Report at II-83.

levels of construction and surface mining activity in the United States. 122/ Activities of Caterpillar Tractor were further slowed by a strike, and this suppressed demand for axle parts. 123/ In an effort to remain competitive with foreign producers, several large U.S. construction machinery manufacturers have shifted production offshore. Such shifts have led to an increase of imported end-products containing foreign produced axle parts, which, when imported as an incorporated part of a finished product, are not subject to this investigation. Demand for construction machinery was further slowed by high interest rates, the large quantity of idle machinery on hand following the recession, and reduced spending on highway construction, reclamation projects, and water and sewer facilities. 124/ The mild improvement in the outlook for the industry that took place in 1984 and 1985 resulted from a rise in construction activity and an increased demand for construction machinery. 125/ As that improvement occurred, import penetration remained essentially stable.

After considering alternative causes of injury to the domestic industry, such as the decline of construction activity and the shift of construction machinery production offshore, and recognizing that import penetration has been relatively stable throughout the period under investigation, we have concluded that increased imports are not a substantial cause of serious injury, or threat thereof, to the domestic industry within the meaning of section 201. We further determine that the decline in domestic demand is a

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122/ Id. at II-84.
123/ Id.
124/ Id.
125/ Id.

more important cause of serious injury, or the threat thereof, to the domestic industry than are increased imports. 126/

6. Levers for front-end loaders and crawler tractors ("levers").

A cast-steel lever is a support arm that permits the manipulation of the bucket or blade on a front-end loader or crawler tractor used in heavy construction. The lever is attached to the front of the vehicle and the back of the bucket and operates as part of the linkage that controls the positioning of the bucket and blade. 127/ Cast-steel levers subject to this investigation range in weight from approximately 150 pounds to 2,500 pounds.

Increased imports--The volume of U.S. imports of levers increased during the period covered by our investigation both in absolute and in relative terms. There were virtually no imports of levers in 1981. In 1985, several hundred tons of levers were imported. 128/ The ratio of imports to production rose from a negligible percentage in 1981, to between 5 and 10 percent in 1985. 129/ The first of the three statutory requirements under section 201 is thus satisfied.

126/ Vice Chairman Liebeler notes that the "alternative causes of injury" all relate to domestic demand. As such, the "causes" must be aggregated so that causation can be examined at the same level of generality. The decline in demand, because of the decline in construction activity and because of the shift of construction machinery production offshore, both shift in the domestic demand curve inward. It is unclear from the text whether these demand shifts have been aggregated. Vice Chairman Liebeler does aggregate these "causes" and concurs that the decline in domestic demand is a more important cause of serious injury, or the threat thereof, to the domestic industry than are increased imports. For an explanation of her causation analysis, see Additional Views of Vice Chairman Liebeler and Commissioner Brunsdale which follow.
127/ Report at II-1.
128/ *Id*. at II-18, table II-3.
129/ *Id*. at II-19, table II-4.

<u>Serious injury or threat thereof</u>—U.S. production of levers fell from 7,711 tons in 1981 to under 4,500 tons in 1983. 130/ Though production increased to 6,226 tons in 1984 (before decreasing to 5,634 tons in 1985), production did not reach 1981 levels in the period of 1982-85. 131/ Capacity utilization fell below 40 percent each year during the period of 1982-85. 132/ The declines in capacity utilization are in part due to increased capacity. Shipments of levers decreased from 7,673 tons in 1981 to 4,623 tons in 1982, and further fell to 4,092 tons in 1983. 133/ Though shipments increased to 6,425 tons in 1984, shipments then decreased in 1985, and never reached 1981 levels during the period of 1982-85. The number of production and related workers fell during the period covered by the investigation, with the lowest levels of employment found in 1982 and 1983. 134/ Hours worked by production and related workers, and wages and total compensation paid to such workers, followed the trend set with respect to the number of production and related workers employed. 135/

130/ <u>Id</u>. at II-21, table II-5.
131/ <u>Id</u>.
132/ <u>Id</u>. at II-20.
133/ <u>Id</u>. at II-25, table II-6.
134/ <u>Id</u>. at II-30, table II-9.
135/ <u>Id</u>.

The financial experience of the domestic industry was generally negative during the period covered by our investigation. 136/ Aggregate net sales of levers declined throughout the period, but for an increase in 1984. 137/ Aggregate operating losses and net losses were reported for each year covered by our investigation except 1984. 138/ On overall operations, the domestic industry reported decreases in current assets; plant, property and equipment; and equity. 139/ Cash flow from operations was negative throughout 1981-85. 140/ The negative production, shipment, employment, and financial data found in our investigation show that the domestic industry is seriously injured.

Substantial cause—Import penetration increased during the period covered by our investigation. 141/ However, the relative size of the increase is due to the virtual nonexistence of any imports in 1981. The ratio of imports to apparent consumption was very small during 1981-84, and remained well below

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136/ Only one U.S. producer of levers supplied usable income-and-loss data for 1981-85. Id. at II-44. The trends evidenced in the usable income-and-loss data are generally confirmed by data presented in table II-19. Id. at II-46.

Vice Chairman Liebeler notes that the usable income-and-loss data represent a very small fraction of actual production. The fact that the data for all steel castings follow similar downward trends is not helpful when such a small proportion of each plant's capacity is devoted to levers. See table II-5. An industry seeking restraints on imports should not be granted relief when such a low proportion of the industry supplies usable information. Otherwise, a strong incentive is created for the poor performers to respond while the healthy firms do not. To find that this industry is seriously injured, or threatened with serious injury, on the basis of such inadequate income-and-loss data sets dangerous precedent. Because this industry fails the substantial cause test anyway, I will assume arguendo that it is seriously injured.

137/ Report at II-45, table II-18.

138/ Id. at II-44.

139/ Id. at II-49, table II-21.

140/ Id. at II-45, table II-18.

141/ Id. at II-74, table II-39.

10 percent in 1985. 142/ Imports of levers rose in 1985, but even with that increase only several hundred tons of levers were imported. 143/

Given historically low levels of import penetration, we find that other causes were more important in causing injury to the domestic industry. The domestic industry faces basic structural problems. It has been unprofitable throughout 1981-85, and capacity utilization has been under 40 percent since 1982. The production of levers, like the production of axle parts, is closely tied to the sale of construction machinery. 144/ In 1982 and 1983, the U.S. market for construction machinery, including excavators, bulldozers, front-end loaders, crawler tractors, and other earth-moving machinery was depressed as a result of low levels of construction and surface mining activity in the United States. 145/ Activities of Caterpillar Tractor were further slowed by a strike, and this further suppressed demand for levers. 146/ In an effort to remain competitive with foreign producers, several large U.S. construction machinery manufacturers have shifted production offshore. Such shifts have led to the increased importation of finished products containing foreign produced levers, which, when imported as parts of a finished product, are not subject to this investigation. Demand for construction machinery was further slowed by high interest rates, the large quantity of idle machinery on hand following the recession, and reduced spending on highway construction, reclamation projects, and water and sewer facilities. 147/ The improvement

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142/ Id.

143/ Commissioner Eckes concludes that increasing imports of levers are not an important cause of the serious injury he has found, and does not join the conclusions concerning other causes of injury to this industry.

144/ Report at II-83.

145/ Id. at II-84.

146/ Id.

147/ Id.

in the outlook for the industry that took place in 1984 and 1985 resulted from a rise in construction activity and an increased demand for construction machinery. 148/

Because import penetration has been low, and after considering alternative causes of injury to the domestic industry, we have determined that increased imports are not a substantial cause of serious injury to the domestic industry within the meaning of section 201 of the Trade Act of 1974. Further, the decline in domestic demand, and the shift of end-product production offshore, have each been more important causes of serious injury, or the threat of serious injury. 149/

7. Drive sprockets for track-laying construction machinery and track-laying tractors ("drive sprockets").

The cast-steel drive sprockets that are subject to this investigation are contained within the supporting framework of crawler-mounted machinery such as tractors, bulldozers, cranes, excavators, bucket loaders, and similar earth-moving and material-handling equipment. A sprocket is a toothed gear located at the rear of the undercarriage of a crawler. Each crawler has two sprockets (one per side) which receive power from the pinion shaft and transfer it to the track chain. As the sprocket rotates, its teeth engage the track chain and propel the crawler either forward or backward. 150/

148/ Id.

149/ Vice Chairman Liebeler concurs that the demand shift has been a more important cause of serious injury or threat of serious injury than increased imports. She notes that the shift of end-product production offshore results in a decrease in demand, as does a decrease in construction activity. Factors that impact domestic demand must be aggregated to provide a proper comparison with shifts in the import supply curve. For an explanation of her causation analysis, see Additional Views of Vice Chairman Liebeler and Commissioner Brunsdale which follow.

150/ Report at II-2.

Increased imports--U.S. imports of drive sprockets fell from 819 tons in 1981 to 738 tons in 1982. Imports then rose to 1,060 tons in 1984 before declining to 882 tons in 1985, a level higher than that of 1981. 151/ The ratio of imports to U.S. production rose, though irregularly, during the period covered by our investigation. 152/ Imports thus increased--albeit irregularly--during the period covered by our investigation.

Serious injury or threat thereof--The industry faces basic problems, with capacity to produce far in excess of demand. U.S. production of drive sprockets fell below 1981 levels during each year of the period of 1982-85, with the exception of 1983 when production was at a slightly higher level than that found in 1981. 153/ Though capacity remained constant throughout the period, capacity utilization never reached 50 percent and, for most of the period, remained far below 50 percent. 154/ Shipments decreased during the period, though irregularly, and never reached 1981 levels in the period of 1982-85. 155/ The number of production and related workers producing drive sprockets fell irregularly between 1981 and 1985. 156/ The average number of hours worked by production and related workers producing drive sprockets, as well as wages paid and total compensation paid to such workers, declined irregularly during the period covered by our investigation. 157/

151/ *Id*. at II-18, table II-3.
152/ *Id*. at II-19, table II-4.
153/ *Id*. at II-21, table II-5.
154/ *Id*. at II-22, table II-5.
155/ *Id*. at II-25, table II-6. Though shipments increased in 1984 from 1983, these increases were apparently the result, in part, of inventory reductions. *Id*. at II-28, table 7.
156/ *Id*. at II-31, table II-10.
157/ *Id*.

The financial experience of U.S. producers during the period covered by our investigation was, but for some positive signs in 1981, negative. Net sales in each year of the period 1982-85 were lower than net sales in 1981. 158/ Net sales were particularly low in 1982 and 1985. 159/ In every year covered by our investigation but for 1981, the industry reported both operating losses and net losses. 160/ Likewise, in every year covered by the investigation except 1981, the industry experienced a negative cash flow from operations. 161/ On their overall operations, U.S. producers reported decreases in total assets and equity, and increases in total liabilities. 162/ Working capital and the current ratio have decreased, while the debt to equity ratio has increased. 163/ We find that the negative financial indicators examined evidence serious injury.

Substantial cause--U.S. imports of drive sprockets fell to their lowest level, 738 tons, in 1982. 164/ Apparent U.S. consumption of drive sprockets also reached its lowest level in 1982. 165/ The ratio of imports to apparent consumption in 1982 rose to the highest ratio shown during the period covered by our investigation even though the volume of imports decreased substantially. After the one-time increase in 1982, the ratio of imports to consumption then decreased. During the same period, apparent U.S. consumption declined and the rate of importation did not vary by more than 80 tons from the level of imports in 1981, except in 1984 when imports reached 1,060

158/ Id. at II-50, table II-22.
159/ Id.
160/ Id.
161/ Id.
162/ Id. at I-53, table II-24.
163/ Id.
164/ Id. at II-74, table II-39.
165/ Id.

tons. 166/ In 1981, the only year of industry profitability, the ratio of imports to apparent consumption was not much lower than it was in the period of 1983-85. 167/ Thus, there does not appear to be a significant relationship between injury to the industry, or threat thereof, and import penetration. 168/

Not only has there not been a significant relationship between injury and imports, but we find causes other than increased imports to have been more important causes of serious injury to the domestic industry. As in the case of axle parts and levers, the production of drive sprockets is closely tied to the sale of construction machinery made in the United States. 169/ We have found that, in 1982 and 1983, the U.S. market for construction machinery, including front-end loaders, crawler tractors, excavators, bulldozers, and other earth-moving machinery, was depressed as a result of low levels of construction and surface mining activity in the United States. 170/ In particular, shipments of crawler-type machinery declined sharply; crawler-type machinery is the major end-product which incorporates drive sprockets. 171/ Furthermore, in an effort to remain competitive with foreign producers, several large U.S. construction machinery manufacturers have shifted production offshore. Such shifts have led to an increase in imports of finished products containing drive sprockets. Demand for construction machinery was further slowed by high interest rates, the large quantity of

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166/ *Id*.
167/ *Id*.
168/ Commissioner Eckes concludes that increasing imports of drive sprockets are not an important cause of the serious injury he has found, and does not join the conclusions concerning other causes of injury to this industry.
169/ Report at II-83.
170/ *Id*. at II-84.
171/ *Id*. at II-83.

idle machinery on hand following the recession, and reduced spending on highway construction, reclamation projects, and water and sewer facilities. 172/ We determine that increased imports are not a substantial cause of serious injury, or threat thereof, to the domestic industry. There are more important causes of the serious injury experienced by the domestic industry, or the threat of serious injury, than increased imports of drive sprockets. 173/

8. Beam hanger brackets for class 6, 7, and 8 on-highway trucks ("beam hanger brackets"). 174/

The beam hanger brackets covered by our investigation are steel castings that support the suspension system for class 6, 7 and 8 on-highway trucks by attaching the rear axle suspension springs to the truck chassis. 175/ Beam hanger brackets are always custom made to an individual purchaser's specifications, and are almost always made from steel. 176/ Though some users have experimented with ductile iron beam hanger brackets, substitution of ductile iron for steel has been limited. 177/ This investigation covers only cast-steel beam hanger brackets.

172/ Id. at II-84.

173/ Vice Chairman Liebeler concurs that the demand shift has been a more important cause of serious injury, or threat of serious injury, than increased imports. She notes that the shift of end-product production offshore results in a decrease in demand, as does a decrease in construction activity. Factors that impact domestic demand must be aggregated to provide a proper comparison with shifts in the import supply curve. For an explanation of her causation alayisis, see Additional Views of Vice Chairman Liebeler and Commissioner Brunsdale which follow.

174/ Commissioner Rohr did not participate in the investigation as to this product.

175/ Report at II-2.

176/ Id.

177/ Id.

Increased imports--The volume of U.S. imports of beam hanger brackets increased, though irregularly, during the period of 1981-85. The volume of imports decreased in 1982, increased by 11.1 percent in 1983, increased by 79.0 percent in 1984, and decreased by 19.5 percent in 1985. 178/ The ratio of imports to U.S. production also increased. 179/ The first of the three statutory requirements under section 201 is thus satisfied.

Serious injury or threat thereof--The production of beam hanger brackets fell substantially during the five-year period covered by our investigation. Production plummeted from 1981 to 1983. 180/ Though production increased between 1983 and 1985, production in 1985 was still well below levels of production reached in 1981. Average capacity to produce beam hanger brackets remained constant, while capacity utilization declined irregularly but markedly. 181/ U.S. producers' shipments showed a significant decline from 1981 to 1983. 182/ Though shipments then increased in 1984 and 1985, shipments during 1982-85 never approached 1981 levels. 183/ Employment in the industry declined during the period from 1981 levels. The average number of production and related workers employed in establishments producing beam hanger brackets fell from over 40 in 1981 to 6 in 1983, before increasing to 19 in 1985. 184/ Hours worked by production and related workers, as well as wages and total compensation paid to such workers, declined over the period, with lowest levels appearing in 1983. 185/

178/ *Id*. at II-18.
179/ *Id*. at II-19, table II-4.
180/ *Id*. at II-21, table II-5.
181/ *Id*. at II-22-23, table II-5.
182/ *Id*. at II-25, table II-6.
183/ *Id*.
184/ *Id*. at II-32, table II-11.
185/ *Id*.

The financial data for the beam hanger bracket industry also show decline, though the industry appears to have shown some improvement in 1985 from weaker performance levels of 1983. Aggregate net sales fell from 1981 to 1983 before rebounding somewhat to a level in 1985 still well below that of 1981. 186/ Aggregate operating losses and net losses were sustained throughout 1982-85, 187/ and cash flow from operations was negative throughout 1982-85. 188/ On their overall or divisional operations, U.S. producers reported declines in the value of total assets, equity and working capital. 189/ All measures of return on investments used in the investigation showed negative returns. 190/

Financial data, as well as trends in production and employment, were generally negative for the period under investigation. Though there were signs of recovery in 1984 and 1985, the recovery was weak and did not return the industry to a profitable position. We determine that the beam hanger bracket industry is seriously injured and therefore address the third statutory requirement, substantial causation.

Substantial cause--Throughout the period covered by the investigation, the domestic market for beam hanger brackets has been dominated by imports. 191/ Increased imports are not, however, a substantial cause of serious injury to the industry. 192/

186/ Id. at II-54, table II-25.
187/ Id. at II-52.
188/ Id.
189/ Id. at II-58, table II-28.
190/ Id.
191/ Id. at II-74, table II-39.
192/ Commissioner Eckes concludes that increasing imports of beam hanger brackets are not an important cause of the serious injury he has found, and does not join the conclusions concerning other causes of injury to this industry.

The greatest aggregate operating losses and net losses were incurred in 1982, the year in which U.S. consumption registered its steepest decline. 193/ As consumption continued to decline into 1983, net losses and operating losses were as severe as any incurred during the period covered by the investigation, other than those losses incurred in 1982. 194/ Imports actually declined during 1981-82, the period of the sharpest decline in consumption. 195/ In those years when the industry appeared to be going through a mild recovery, imports as a share of consumption were at a relatively high level compared with 1981 and 1982. 196/ Injury suffered by the industry is more clearly associated with the decline in U.S. consumption than an increase in imports. This decline mirrors factory sales during 1981-85 of class 6, 7, and 8 on-highway trucks in which beam hanger brackets are installed. 197/ In 1981, 244,088 of such trucks were sold, but in 1982, sales decreased to 156,838 trucks, or by 35.7 percent. 198/ In 1983, sales increased slightly to 166,315 trucks, but sales still remained well below 1981 sales. 199/ When sales of trucks increased in 1984, so did U.S. consumption of beam hanger brackets. 200/ During the same period, the ratio of imports to consumption decreased.

After considering alternative causes of injury to the domestic industry, and recognizing that there is insufficient relationship between the level of imports and the profitability of the domestic industry, we determine that

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193/ Report at II-74, table II-39.
194/ *Id*. at II-54, table II-25, and II-74, table II-39.
195/ *Id*. at II-74, table II-39.
196/ *Id*. at II-54, table II-25, and II-74, table II-39.
197/ *Id*. at II-82.
198/ *Id*.
199/ *Id*.
200/ *Id*. at II-74, table II-39, and II-82.

increased imports are not a substantial cause of the serious injury or threat experienced by the domestic industry. 201/

9. Sockets and suspension brackets for 5-ton military trucks ("sockets and suspension brackets").

The sockets and suspension brackets covered by our investigation are cast-steel parts used in the suspension system of 5-ton military trucks. Sockets weigh approximately 30 pounds, and are butt welded on each end of the truck's front axle to support the truck's front steering spindles. The suspension bracket weighs approximately 70 pounds, and is bolted to the rear axle and center of the leaf springs on a military truck. Sockets and suspension brackets are now only used on military vehicles, and are custom made to the military purchaser's specifications. The major domestic market for sockets and suspension brackets thus consists of the few producers of 5-ton military trucks. 202/

Increased imports--The volume of U.S. imports of sockets and suspension brackets increased, though irregularly, during the period of 1981-85. 203/ There were virtually no U.S. imports of sockets and suspension brackets during the period of 1981-84. 204/ In 1985, however, several hundred tons of

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201/ Vice Chairman Liebeler finds that the decrease in demand for beam hanger brackets is a more important cause of injury to the domestic industry than the shift in the import supply curve. She notes that consumption is not a good proxy for demand because consumption is the point of intersection of the demand curve and the supply curve. Thus, a shift inward of the supply curve (e.g., due to an increase in labor costs) results, ceteris paribus, in a decrease in consumption. For an explanation of her causation analysis, see Additional Views of Vice Chairman Liebeler and Commissioner Brunsdale which follow.

202/ Report at II-2.

203/ Id. at II-18, table II-3.

204/ Id.

sockets and suspension brackets were imported. 205/ In 1985, the only year in which there were any imports of consequence, there was an increase in the ratio of imports to domestic production. 206/ Inasmuch as there were almost no U.S. imports during 1981-84, imports in 1985 represented an increase in imports in absolute and relative terms from earlier levels.

Serious injury or threat thereof--During the period covered by our investigation, U.S. production of sockets and suspension brackets reached its lowest point in 1985. 207/ Capacity remained constant throughout the period while capacity utilization decreased irregularly. 208/ U.S. producers' shipments were at their highest level in 1981 and declined, though irregularly, during the period. 209/ Shipments showed the greatest declines in 1981-82 and 1984-85. 210/ Likewise, employment figures showed their greatest declines in 1981-82 and 1984-85. 211/ The number of production and related workers producing sockets and suspension brackets declined from 1981 to 1982, increased from 1982 to 1984, and fell to its lowest level in 1985. 212/ The hours worked by production and related workers, as well as wages and total compensation paid to such workers, fell irregularly during the period covered by our investigation. 213/ During that same period, however, average hourly wages of production and related workers producing sockets and suspension brackets rose steadily. 214/

205/ Id.
206/ Id. at II-19, table II-4.
207/ Id. at II-21, table II-5.
208/ Id. at II-22-23, table II-5.
209/ Id. at II-25, table II-6.
210/ Id.
211/ See Id. at II-33, table II-12.
212/ Id.
213/ Id.
214/ Id.

Aggregate net sales by U.S. producers of sockets and suspension brackets decreased irregularly, and fell to their lowest level in 1985. 215/ Producers reported aggregate operating losses and net losses throughout the period under investigation, 216/ with aggregate operating losses increasing dramatically between 1981 and 1984. 217/ Cash flow from operations was negative in each period. 218/ Virtually every indicator that we reviewed during the course of our investigation indicates that the industry is experiencing serious injury, or the threat thereof.

Substantial cause—We find that imports are not a substantial cause of the condition of the domestic industry. The only measurable import penetration occurred in 1985. 219/ Yet the domestic industry was seriously injured throughout the period covered by our investigation and faces basic structural problems. In fact, in absolute terms, the industry had the greatest negative cash flow and operating losses in 1983 and 1984, when there were virtually no imports. 220/ Throughout the period under investigation, capacity utilization never reached profitable levels. 221/ We therefore find no relationship whatsoever between the serious injury suffered by the domestic industry, and increased imports—much less that increased imports are a substantial cause of serious injury or threat thereof. 222/

215/ Id. at II-59, table II-29.
216/ Id.
217/ Id.
218/ Id.
219/ Id. at II-74, table II-39.
220/ Id. at II-59, table II-29.
221/ Id. at II-23, table II-5.
222/ Vice Chairman Liebeler finds decreased demand for sockets and suspension brackets to be a more important cause of injury to the domestic industry than increased imports, and therefore increased imports are not a substantial cause of serious injury. For an explanation of her causation analysis, see Additional Views of Vice Chairman Liebeler and Commissioner Brunsdale which follow.

10. Parts of valves. 223/

The steel valve castings subject to our investigation are cast component parts of steel valves, including investment castings and alloy steel and stainless steel castings. Steel valve castings are distinguished from completed valves which are not subject to this investigation. The steel valve castings covered include, but are not limited to, (1) the valve body (sometimes called the "shell") that holds other valve components together in the assembly; (2) the bonnet (the upper part of the valve body assembly which guides the stem and contains the stem packing assembly); (3) the stem (the rod or spindle to which motion is imparted outside the valve assembly to move the disc or wedge inside the valve); (4) the wedge (a flow-controlling element with inclined seating surfaces); (5) the handle (a device connected to the valve stem to permit manual operation); and (6) seat rings (a soft seat element which is usually an o-ring and is the contact surface of the seat). 224/

Steel valve castings are used in the production or repair of completed steel valves. Steel valves are used primarily in piping systems found in the petroleum refining, petrochemical, electrical power generation, and pulp and paper manufacturing industries. 225/ Such valves vary in size from a fraction of an inch to more than 30 feet in diameter. 226/ Valves are used

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223/ Commissioner Brunsdale concurs with the majority, but appends Additional Views (together with Vice Chairman Liebeler) as well as her Additional Findings setting forth her reasoning on how a decline in domestic demand can injure the domestic industry in the presence of a fixed world price for the imported product. See also, supra, n.103 for a discussion of this issue.

224/ Report at II-2-3.

225/ Id. at II-3.

226/ Id.

at pressures ranging from a vacuum to the highest pressures attainable today, and at a wide range of temperatures. 227/

Increased imports --U.S. imports of valve parts increased, though irregularly, during the period covered by our investigation. Imports of steel valve parts rose from 8,556 tons in 1981 to 12,067 tons in 1982. 228/ Imports then fell sharply to 4,302 tons in 1983, but by 1985 increased to 8,908 tons. 229/ Though the increase in volume of imports was gradual, the ratio of imports to U.S. production rose sharply from 1981 levels during the period covered by our investigation. 230/ We therefore find that the first statutory requirement--increased imports--is satisfied with respect to steel valve parts.

Serious injury or threat thereof--Reported U.S. production of steel valve parts dropped sharply from 47,115 tons in 1981 to 16,322 tons in 1983. 231/ Though production then increased to 22,942 tons in 1985, production in 1985 was still well below 1981 and 1982 levels. 232/ Domestic capacity to produce valve castings rose during the period covered by our investigation and capacity utilization fell sharply. 233/ Capacity utilization was 83.7 percent in 1981 before falling to 25.5 percent in 1983. 234/ Though capacity utilization then rose to 36.2 percent in 1985, capacity utilization never again approached 1981 levels. 235/ U.S. producers' shipments declined

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227/ Id.
228/ Id. at II-18, table II-3.
229/ Id.
230/ Id. at II-19, table II-4.
231/ Id. at II-21, table II-5.
232/ Id.
233/ Id. at II-22-23, table II-5.
234/ Id. at II-23, table II-5.
235/ Id.

sharply from 12,261 tons in 1981 to 5,285 tons in 1984, and though shipments increased in 1985, the level of shipments in 1985 was less than half that of 1981. 236/ The trend in the number of production and related workers employed producing valve parts paralleled the trend in volume of shipments. The domestic industry employed 3,652 production and related workers in 1981, but the number steadily declined to 1,955 workers in 1984, before rising slightly to 2,008 workers in 1985. 237/ The hours worked by production and related workers, as well as wages and total compensation paid to such workers, fell irregularly during the course of the investigation, with lowest levels attained in 1983. 238/

The financial performance of U.S. producers over the past five years has been bleak. Aggregate net sales of parts of valves plummeted from $96.5 million in 1981 to $47.5 million in 1983. 239/ Sales then increased, but only by 4 percent, to $49.3 million in 1985. 240/ Aggregate operating income dropped by 99 percent from $7.4 million, or 7.7 percent of sales in 1981, to $81,000, or 0.1 percent of sales, in 1982. 241/ Operating losses were incurred in 1983, 1984 and 1985. 242/ Cash flow from operations decreased from $9.0 million in 1981 to $1.9 million in 1982. In 1983, 1984 and 1985, the industry had a negative cash flow. 243/ On their overall or divisional operations, U.S. producers reported decreases in the value of total assets, equity and working capital, and a decrease in return on

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236/ *Id*. at II-25, table II-6.
237/ *Id*. at II-34, table II-13.
238/ *Id*.
239/ *Id*. at II-65, table II-33.
240/ *Id*. at II-64-65, table II-33.
241/ *Id*.
242/ *Id*. In 1983 and 1985, operating losses of $3.7 million, or 7.5 percent of sales, were incurred.
243/ *Id*. at II-64-65, table II-33.

investments. 244/ The negative financial, production, shipment, and employment data clearly show serious injury.

Substantial cause—Apart from unusually high levels in 1982 and low levels in 1983, the level of imports has been constant. But for high levels in 1982, import volume fluctuated between 4,302 tons in 1983 and 8,908 tons in 1985. 245/ After a sharp increase from 1981 to 1982, the ratio of imports to apparent consumption remained stable. 246/ Though, with the exception of aberrations in 1982 and 1983, the level of imports remained unchanged during the period of our investigation, apparent U.S. consumption dropped precipitously from 54,965 tons in 1981 to 20,663 tons in 1983. 247/ Consumption rose modestly after 1983, but never approached 1981 levels. 248/ A large contraction in the valve industry, and hence in the valve parts industry, took place in 1982 and 1983. 249/ The most significant purchasing sector for valves is the petrochemical industry. Demand for valves and valve parts is stimulated by capital expenditures on new pipeline projects, as well as on replacement valves in existing pipelines. 250/ In 1981-83, recessionary pressures caused a downturn in capital investments. Oil industry capital outlays will be an estimated $33.8

244/ Id. at II-69, table II-36.
245/ Id. at II-74, table II-39.
246/ Id.
247/ Id.
248/ Id.
249/ Id. at II-84. Demand for valve parts virtually collapsed starting in 1982, and has shown negligible recovery. Demand fell nearly 17 percent in 1982, then dropped more than 50 percent in 1983. Even with the recovery of demand in 1984 and 1985, apparent consumption is still little more than half of 1981 levels.
250/ Id.

billion in 1986, down 24 percent from 1985, and down 60 percent from the peak of $83 billion in 1981. 251/

We determine that increased imports are not a substantial cause of serious injury, or threat thereof, to the domestic industry. The downturn in consumer demand, and especially the downturn associated with the recession in the domestic petrochemical industry, has been a greater cause of serious injury, or threat thereof, to the steel valve parts industry than have increasing imports. 252/

11. Bronze ship propellers.

The bronze ship propellers covered in this investigation include ship and boat propellers ranging in diameter from 10 inches to 35 feet and in weight from a few pounds to over 200 tons. The domestic industry generally classifies the propellers covered by this investigation into three basic categories according to size and end use: (a) propellers for yachts and pleasure boats, under 36 inches in diameter; (b) propellers for commercial workboats and small military vessels, between 3 and 10 feet in diameter; and (c) ship propellers for oceangoing vessels, between 10 and 35 feet in diameter. The propellers subject to our investigation include those made of nickle-aluminum bronze as well as those made of manganese bronze. 253/

Increased imports--The volume and value of U.S. imports of bronze ship propellers both increased, albeit irregularly, during the course of our

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251/ Id.
252/ For an explanation of Vice Chairman Liebeler's causation analysis, see Additional Views of Vice Chairman Liebeler and Commissioner Brunsdale which follow.
253/ Report at III-1.

investigation. 254/ The volume of imports declined from 158 tons in 1981 to 109 tons in 1984, but then increased to 362 tons in 1985. 255/ The ratio of U.S imports to U.S. production more than doubled from levels of 1981 to 13.4 percent in 1985. 256/ We therefore find that the first statutory requirement—increased imports—is satisfied with respect to bronze ship propellers.

Serious injury or threat thereof—Despite some irregular declines in some factors, the basic productive facilities and plant utilization, employment and compensation, and financial position of the domestic industry remained generally intact and broadly stable during 1981-85. 257/ Capacity remained constant. 258/ After declining in 1981, production and capacity utilization remained steady during 1982-85, fluctuating within a relatively narrow band. Employment figures showed very little change throughout the period. 259/ The average number of production and related persons producing bronze ship propellers increased from 602 workers in 1981 to 641 workers in 1983, before declining to 583 workers in 1985, a level not far below 1981 levels of employment. 260/ Hours worked by production and related workers producing bronze ship propellers remained relatively constant throughout the period covered by our investigation. 261/ Wages and total compensation paid to such workers increased over the period covered by our investigation, and

254/ Id. at III-11, table III-1.
255/ Id.
256/ Id. at III-10.
257/ Id. at III-12, table III-2; III-15, table III-4; and III-17, table III-5.
258/ Id. at III-12, table III-2.
259/ Id. at III-15, table III-4.
260/ Id.
261/ Id.

average hourly wages rose during the period. 262/ Employment figures do not evidence injury.

On the other hand, the financial condition of the U.S. industry is somewhat mixed. Net sales have not fluctuated much during the period covered by our investigation, except for 1983 when sales fell somewhat. 263/ Cash flow from operations has remained positive, though it has dropped considerably from 1981 and 1982 levels. 264/ Net income and operating income was reported for each year covered by our investigation, but levels of such income were considerably lower in 1983, 1984, and 1985 than they had been in 1981 and 1982. 265/ Though income has been declining, other financial data has been positive. Throughout the period under investigation, research and development expenses have increased. 266/ Capital expenditures are up over 1981 levels, though not as high as they were in 1982 and 1983. 267/ Investment in property, plant, and equipment is stable, and total current assets have increased in each year covered by our investigation. 268/ Equity and working capital have increased, and the ratio of debt to equity ratio has decreased. 269/ There are, therefore, positive signs in the financial data. Moreover, year-end inventories of imported bronze ship propellers have been relatively constant during 1981-85. 270/ We find that though the financial data contain some negative signs as well as positive, relevant indicators do not evidence serious injury or threat thereof.

262/ Id.
263/ Id. at III-17, table III-5.
264/ Id.
265/ Id.
266/ Id. at III-20-21.
267/ Id.
268/ Id. at III-20, table III-7.
269/ Id.
270/ Id. at III-22.

ADDITIONAL VIEWS OF VICE CHAIRMAN LIEBELER AND COMMISSIONER BRUNSDALE

The general approach we adopt for analyzing the causation issue in Section 201 cases is explained in our earlier decision on Wood Shakes and Shingles.[1] As indicated there, this approach is guided by the principle that it is imperative to be able to distinguish between cause and effect. In addition, it is important to select a method of analysis that not only incorporates the specific variables cited by Congress as relevant to escape clause cases,[2] but does so in a manner that is coherent and internally consistent.[3]

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1 Inv. No. TA-201-56, USITC Pub. 1826 (1986) at 55 (hereinafter referred to as Wood Shakes and Shingles).

2 Some of these variables are capacity utilization, profits, sales, inventories, employment, and wages. H.R. Rep. 571, 93rd Cong., 1st Sess. 47 (1973).

3 "The Commission is directed to take into account all economic factors it considers relevant," H. Rep. 93-571, 93 Cong., 1st Sess. 47 (1973). Also, "The Commissioners will have to assure themselves that imports represent a substantial cause or threat of injury, and

(Footnote continued on next page)

The method of analysis we use is traditional demand and supply analysis.[4] This method enables us (1) to distinguish situations where "increased imports" are a substantial cause of serious injury from situations where the increase in imports is an effect of changes in other factors operating in the domestic market and (2) to determine whether increased imports are at least as important a cause of serious injury as any other cause. Demand and supply analysis is a flexible tool that can be applied to a wide variety of specific fact situations. For example, in Wood Shakes and Shingles the evidence indicated that the domestic and the imported product were essentially the same and could therefore be treated as a homogeneous good. Under these

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(Footnote continued from previous page)
not just one of a multitude of equal causes or threats of injury." S. Rep. 1298, 93rd Cong., 2nd Sess. 120 (1974).

4 Throughout these Views, the term "demand" refers to the relationship between the full range of prices and the quantities that would be purchased at each price. Similarly, the term "supply" refers to the relationship between the various possible prices and the quantities associated with each price that firms will produce and offer on the market. A "decline in demand", for instance, refers to a reduction in the aggregate quantity that consumers would purchase at any given price. Thus, the term "demand", referring to the entire relationship, should be carefully distinguished from the expression "quantity demanded", and similarly for "supply" and "quantity supplied". The basic concepts of demand and supply are explained in more detail in any principles of economics textbook, such as Samuelson and Nordhaus, Economics, 12th ed., chapter 4 (1985).

conditions, demand and supply analysis of causation requires an examination of three general components: (1) the domestic demand for the product, (2) the domestic supply of U.S. producers, and (3) the import supply of foreign producers. This led us to consider how each of these three general components (or curves) had changed during the period of investigation, and could therefore be called a "three-curve analysis."[5]

In the present case, however, the evidence concerning certain vehicular steel castings and valve parts indicates that purchasers do not consider the domestic product and the imported product to be the same (i.e., are not homogeneous).[6] Thus the domestic and imported products are properly analyzed as

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[5] Wood Shakes and Shingles, at 90. Note that a change in a component, such as an increase in import supply, means that there is a shift in the import supply curve. For this to occur there would need to be a change in one (or more) of the variables that influence import supply, such as foreign production capacity or technology. It is important to remember that an "increase in the quantity of imports" is not the same as an "increase in import supply." The former refers to a situation where the quantity of imports increases along an unchanging import supply curve, whereas the latter refers to a situation where the entire import supply curve has shifted outward. For a discussion of this crucial point, see Samuelson and Nordhaus, supra.

[6] Vice Chairman Liebeler notes that the same evidence indicates that the domestic axle parts, levers, drive sprockets, beam hanger brackets, and sockets and suspension brackets differ from the imports of these products.

differentiated products.[7] Under this fact situation, causation analysis using traditional demand and supply is more complex than in Wood Shakes and Shingles because it is necessary to assess how changing market conditions affect two products, not just one. To do this we examine four general components: (1) the domestic demand for the U.S. product, (2) the domestic demand for the imported product, (3) the domestic supply of the U.S. producers, and (4) the import supply of foreign producers. As is developed more fully below, this causation analysis will distinguish between the effects of changes in each of these four components (or curves) and therefore could be referred to as a "four-curve" analysis.[8]

The fact that a domestic product is not a perfect substitute for a similar imported product has not as far as we are aware

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Several studies have found that such product differentiation is appropriate for many manufactured products. See for example R. E. Baldwin and W. E. Lewis, "U.S. Tariff Effects on Trade and Employment in Detailed SIC Industries," in W. G. Dewald, ed., The Impact of International Trade and Investment on Employment, at 243.

8
Vice Chairman Liebeler's application of this causation analysis for the industries for which she found increased imports and serious injury is in the majority opinion at footnotes 92, 126, 149, 173, 201, 222, and 252 and in the accompanying text. This analysis indicates that in each of the industries she analyzed, the decrease in demand for domestic product due to exogenous factors was a greater cause of injury than the demand drop due to increased imports.

(Footnote continued on next page)

been formally analyzed in any Commission decision. However, the issue was raised by Commissioner Rohr in his Additional Views to Electric Shavers and Parts Thereof.[9] Specifically, Commissioner Rohr asserted that product differences resulted from the differences in "design age" of the domestic and imported shavers. Commissioner Rohr correctly recognizes the importance of taking product heterogeneity into account, where appropriate, in an analysis of domestic and international markets.

At this point we turn to an analysis of injury resulting from a contraction of domestic demand. This discussion explains the conditions that must be present for a decline in domestic demand to injure a domestic industry and shows how the impact of such a decline can be compared to the impact of increasing imports in determining the substantial cause of injury.

In a Section 201 case, where imports from all countries are considered, the United States often faces a highly elastic import supply. This is significant because it means that the product

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(Footnote continued from previous page)
Commissioner Brunsdale's causation analysis with respect to those industries for which she found serious injury is explained in her Additional Findings, which follow.

9 Inv. No. TA-201-57, USITC Pub. 1819 (1986). We did not reach the causation issue in Electric Shavers because we found no serious injury or threat thereof.

price is set in the global market and that domestic supply and demand conditions have only minor influences on domestic price. In such a case, a price reduction must have originated mainly in increased import supply, regardless of any dramatic reduction in demand by domestic consumers. The reason is that international suppliers always stand ready to act as residual sellers to domestic consumers at the world price.

It is nonetheless true, however, that there are two alternative market conditions in which reduced domestic demand might very well weigh more heavily than increased imports in the causation of serious injury. For instance, perhaps the United States faces a less-than-infinitely-elastic import supply,[10] such as might arise if the world quantity supplied increased with price and the United States, as a nation, was a "large" customer in the world market. In that case, domestic factors, such as demand, would not be negligible in setting world price and thus a decline in demand could be responsible for injuring domestic producers.

Alternatively, the imported and domestic products may not be homogeneous. If the products are differentiated (that is, not

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[10] Price elasticity of supply (demand) is a measure of the

(Footnote continued on next page)

perfect substitutes to consumers), then even if the United States faces an elastic import supply, a decline in domestic demand for the domestic product can indeed inflict serious injury.[11] In this situation, such a decline in demand can be a more important cause of such injury than imports. As noted earlier, we believe that the products under investigation in this case are heterogeneous.

Of course, it remains true that there are differing degrees of product heterogeneity. Thus, in many instances product heterogeneity, while undeniably present, will be sufficiently unimportant that it can be disregarded without interfering with valid reasoning and conclusions. This judgment will often rest on whether the ratio of the price of the imported article to that of the domestic article changes significantly over the period of investigation. A large relative price change would be consistent with less than perfect product substitutability.

Furthermore, in some cases, two heterogeneous products simply differ in the amount of a specific product attribute they

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(Footnote continued from previous page)
responsiveness of quantity supplied (demanded) to changes in price, and is defined as the percentage increase (reduction) in quantity supplied (demanded) associated with a one percent increase in price.

[11] In addition, it is necessary that domestic producers do not face an infinitely elastic foreign demand curve.

respectively embody. In such situations, the underlying demand is for the attribute. The analysis can then be simplified by reducing the two products to their common attribute and representing the products together in a single attribute market.[12]

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[12] For instance, some cars are more durable than others. Where such services may reasonably be isolated and measured, differentiated products could be appropriately recast into demand and supply for product services and thus reduced to a single market for services. See Kelvin Lancaster, "A New Approach to Consumer Theory," Journal of Political Economy, Vol. 74 (April 1966), at 132-57, and subsequent contributions to the literature on hedonic pricing that Lancaster pioneered. For instance, in Certain Portable Electronic Calculators (Inv. No. 337-TA-198), submissions received by the Commission argued persuasively that the common service was "calculating power" and showed that the prices of individual calculators could be predicted based on the amount of this quality attribute.

ADDITIONAL FINDINGS OF COMMISSIONER BRUNSDALE

As I indicated in footnotes 103 and 223 to the majority's views, I agree with the conclusion that imports are not a substantial cause of serious injury to domestic producers of beam hanger brackets, drive sprockets, levers, and axle parts, as well as parts of valves. As noted there, I believe the majority's analysis of causation for these products is obscure. In these Additional Findings, I apply the analysis discussed in my preceding Views with Vice Chairman Liebeler to the two industries where a decline in domestic demand must be considered as a possible cause of injury more important than increased import supply. These are the vehicular steel castings industry and the valve parts industry.

To provide the concrete framework required to apply these principles, certain more technical methods are presented in the accompanying appendix. (This framework is designed to use the type of data available to the Commission in its investigations.) Under the conditions elaborated there, a decline in domestic demand for the domestic product--a decline that is unrelated to increased import supply--can indeed cause injury to the domestic industry. Such injury must be weighed against any injury attributable to an independent decline in demand for the domestic product that is caused by increased import supply.

While this framework abstracts from several issues, it does provide a coherent and impartial way to understand the relative impacts of increased import supply and decreased domestic demand on the domestic industry. There are at least two major reasons why such an approach is desirable. For one thing, it is explicit, subject to examination by all who want to understand what underlies the determination. In addition, if the relative impacts of foreign and domestic causes are sufficiently divergent, the approach makes it possible to determine with great confidence whether the petitioners' claims are correct or without merit.

Vehicular Steel Castings

The vehicular steel castings industry is seriously injured. Although cash flow from operations fluctuated somewhat after 1981, it declined from a positive $1.4 million that year to a negative $1.3 million in 1985.[1] Furthermore, the majority found that each

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1 Table 1, INV-J-091.

of its defined industries producing respectively each of the five items comprising vehicular steel castings was seriously injured or threatened with serious injury. Thus, in finding serious injury to the more broadly defined vehicular steel castings industry, I am doing little more than agreeing with the implication of the majority's findings. Clearly, it would be most improbable for the entire industry not to be seriously injured if each of its component industries was.

Turning to causation, the first point to note is that imports of the subject vehicular steel castings increased only slightly between 1981 and 1985, from over 4,000 tons to 4,810 tons, and were actually lower in '85 than in '84. Second, domestic consumption fell by a significant amount, from 31,561 tons in 1981 to 24,632 tons in 1985,[2] indicating a sharp contraction in domestic demand.

Moreover, while the data on prices appear weak and somewhat in conflict,[3] they lead to two significant conclusions. First, consistent differences between the prices for domestic and imported items strongly suggest that domestic and imported vehicular castings are differentiated in the eyes of domestic consumers. Second, the price of the imported product appears to have declined, which in

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[2] INV-J-093.

[3] Report at II-76-II-79, tables II-40-II-44 and at II-82, table II-46.

this case indicates a downward shift in the import supply curve faced by U.S. consumers.[4] In addition, the United States is no longer a world giant in vehicle production, and faces highly elastic import supply for vehicle parts, including the steel castings considered here.

Demand has contracted, import supply has increased, and imports are elastically supplied. Thus, the conditions essential for applying the analytical framework developed in the appendix to these Findings are met. The analysis indicates that in the years 1981-85 the decline in domestic demand alone (that is, unrelated to increased imports) reduced consumption of the domestic product by roughly four times more than did the increase in import supply. Since the decline in demand is the more important cause, I find that imports are not a substantial cause of injury.

Certain Valve Parts

I concur with the majority with respect to increased imports and serious injury of the domestic industry producing certain valve

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4 In the absence of better price data, it is appropriate to extend

(Footnote continued on next page)

parts.

As for causation, the data are similar to those on vehicular steel castings. Imports of valve parts increased only slightly over the period of the investigation, from 8,556 tons in 1981 to 8,908 tons in 1985.[5] Moreover, domestic consumption decreased sharply from 54,965 tons in 1981 to 31,330 tons in 1985.[6] Unit values of import shipments also fell significantly over this period,[7] as did more narrowly defined prices.[8]

Since at least eleven major industrial countries, as well as other nations, export valve parts to the United States,[9] it appears likely that a large global market exists for this product, that the United States plays a reasonably small role in that market, and that U.S. consumers face highly elastic world supply for the product. Finally, since the price of the domestic product is about

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the benefit of the doubt to petitioners by assuming that any increase in the quantity of imports (after allowing for the general decline in demand allocated proportionally between the domestic and import product) is due to an increase in the supply of imports.

[5] Report at II-18, table II-3

[6] Id. at II-15, table II-2

[7] Id. at II-18, table II-3

[8] Id. at II-81, table II-45

[9] Id. at D-11.

twice that of the imported product,[10] it seems virtually certain that consumers do not view the imported product as identical to the domestic product.

Thus, once again, the conditions are present for applying the analytical framework set forth in these Findings. The analysis shows that the decline in domestic demand alone (that is, unrelated to increased imports) reduced consumption of the domestic product by roughly five times more in the years 1981-85 than did the increase in import supply. Since the decline in domestic demand is the more important cause, I find that imports are not a substantial cause of injury.

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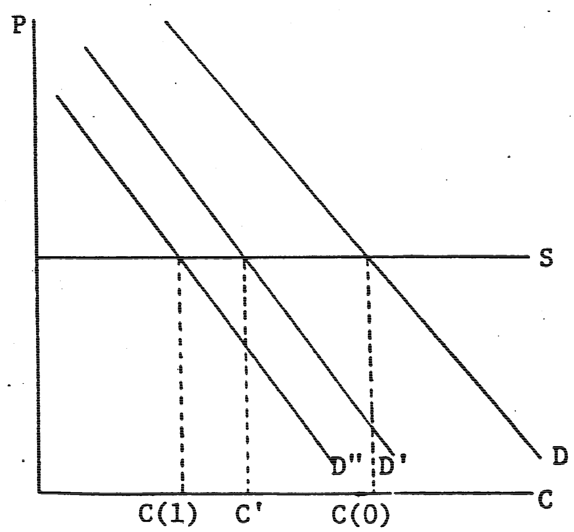
[10] Id. at II-81, table II-45

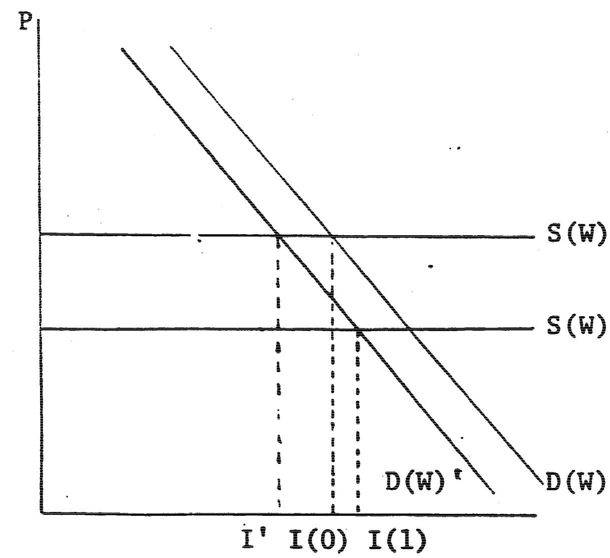
Appendix

If American consumers face infinitely elastic supply of a differentiated import product, but American producers do not face a horizontal world demand curve,[11] the situation may be portrayed in the following graphs:



GRAPH A

Domestic Product



GRAPH B

Imported Product

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The demand and supply relationships are represented geometrically as curves. See *supra* Additional Views of Vice Chairman Liebeler and Commissioner Brunsdale, n. 4.

In graph A, the S curve is domestic supply[12] while the D curve is initial domestic demand for the U.S. product. In graph B, S(w) is initial world supply of the imported product, while D(w) is U.S. demand for that product. In each graph, price is represented on the vertical axis, while quantity sold and consumed is represented on the horizontal axis. Thus, initial consumption of the domestic product is quantity C(0) while initial consumption by American consumers of the imported product is quantity I(0).

Now, suppose domestic demand contracts proportionally for both the U.S. product and imported product. This is shown as a leftward shift of both the D curve in graph A and the D(w) curve in graph B. The effect is to reduce the consumption of the domestic product to quantity C' and the imported product to quantity I'.

Next, let import supply increase. This is represented in graph B by a downward shift in world supply of the imported product from S(w) to S(w)', equivalent to a reduction in the price of that product. American consumers will thus increase their consumption of the imported product from quantity I' to quantity I(1), as

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[12] The injury attributable to the decline in domestic demand relative to that attributable to increased imports would remain unchanged even if the domestic supply curve were upward sloping, as is usually believed to be the case, provided the curve is reasonably linear. The absolute extent of injury imposed by each of the two causes would be affected, however.

illustrated in graph B. Since the imported product is highly (but not perfectly) substitutable for the domestic product, at least part of the increased consumption of the imported product will come at the expense of domestic producers, i.e. demand for the domestic product will decline further. This is pictured in graph A as a second leftward shift of curve D′ to position D′′. Since the products are imperfect substitutes, there is no reason to suppose that the reduction in demand for the domestic product will exceed the increase in quantity of the imported product demanded as a result of the increase in import supply.

This analysis presents the proper way to disaggregate the effects of a decline in domestic demand and an increase in import supply and to assign relative weights to each. Namely, C(0) minus C′ is the injury induced by falling demand, while C′ minus C(1) is the injury induced by increased import supply. If the ratio of the first to the second is greater than one, the decline in demand is a more important cause of injury than is the increase in import supply.

VIEWS OF CHAIRWOMAN STERN

FINDING INCREASED IMPORTS THE MOST IMPORTANT CAUSE OF SUBSTANTIAL INJURY AND THREAT OF SUBSTANTIAL INJURY TO THE BEAM HANGER AND SOCKETS AND SUSPENSION BRACKET INDUSTRIES

I agree with my colleagues that imports of beam hanger brackets and socket and suspension brackets have recently increased, and that the domestic industries producing these products are substantially injured. I also agree that a decline in demand for the primary end use products for these industries--highway trucks and five ton military trucks--has played an important role in their poor performance for the past five years. However, unlike my colleagues, I have found that imports have been or will be as important as this decline in consumption, and have therefore made affirmative determinations.

Beam Hanger Brackets

Between 1981 and 1982 beam hanger bracket production fell almost 70 percent. This was undoubtedly related to the fact that consumption of the product fell by almost one half during the year. Although the absolute quantity of beam hanger bracket imports fell between 1981 and 1982, as demand shrunk the market share of low-priced imports [1/] increased considerably, to almost 70 percent. Thus, both a considerable decline in demand for the product and the stronger foothold gained by imports on the domestic market contributed equally to the financial about-face of the industry, from modest profitability in 1981 to gigantic losses in 1982. [2/]

In 1983, the absolute quantity of imports increased only slightly. But consumption fell again, albeit less

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1/ Pricing data from Commission questionnaires were limited to one U.S. producer and two importers. Such a limited sample has obvious shortcomings for specific price comparisons, but in light of the small size of this industry, is indicative of price trends throughout the period of investigation. Exact figures are confidential, but show that imports consistently undersold the domestic product by considerable margins. Report at II-79, Table II-43.

2/ See Report at II-54, Table II-25.

dramatically than in 1982, and domestic beam hanger bracket production plummeted to only a fraction of its level in 1981. Imports now clearly dominated the market with an 86 percent market share. And the immense losses of 1982 became staggering losses in 1983.[3/]

Significantly, in 1984, when total consumption of beam hanger brackets completely recovered, domestic production was only a third of its level in 1981, and import penetration remained at a high 82 percent. The industry appears to have stabilized in 1985 at low plateau: demand for beam hanger brackets is back, but now the market for domestic producers is one characterized by huge losses, low production and shipment levels, and a domestic market share of only 23 percent.

While lower demand for the end-use product[4/] may have precipitated the influx of imports in 1982 and contributed to the industry's injury in 1983, the very high and stable

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3/ See Report at II-54, Table II-25.

4/ It was argued that legislation passed in 1980 and 1982, the Motor Carrier Act and the Surface Transportation Assistance Act, were causes of injury more important than imports because the allowance of more cargo per truckload adversely affected demand for highway trucks. However, figures indicate that sales of trucks in 1985 were higher--not lower--than in 1981. See Report at II-82.

market share of imports for the past three years, coincident with enduring losses in production and shipment levels, demonstrates that in the most recent period imports have been the major cause of substantial injury to the domestic beam hanger bracket industry, and thus an affirmative determination is warranted.

Sockets and Suspension Brackets

This industry was clearly experiencing serious injury throughout the period of investigation, before imports entered the domestic market in a major way in 1985. 5/ However, in 1985, imports suddenly took more than one quarter of the domestic market. Coupled with this sizable increase in imports was a worsening of the industry's condition. 6/ In addition to the abrupt appearance of a significant import market share, another problem confronted the industry in

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5/ Shipments and production fell significantly between 1981 and 1982, and financial losses were considerable every year. See Report at II-59, Table II-29

6/ Production, employment and shipments all fell substantially, and financial losses were even heavier than in previous years.

1985: a significant decline in demand for the end-use product, 5-ton military trucks.[7/] Thus both imports and a decline in demand for the end use product employing sockets and suspension brackets played a role in the further deterioration of the industry in 1985.

The Commission is thus presented with a weakened domestic industry that has just encountered a sudden flux of imports in 1985. The question, then, is one of threat--what is the likelihood that imports will continue to increase and thus be the primary cause of the domestic socket and suspension bracket industry's serious injury? Pricing data, although limited, indicates that imports are priced below the domestic product.[8/] Information available to the Commission[9/] demonstrates the probability that imports of sockets and suspension brackets will continue at their current level or increase. I therefore find that increased imports of sockets and suspension brackets is the substantial cause of a threat of serious injury to this domestic industry.

7/ See Report at II-81.

8/ See Report at II-80, Table II-44.

9/ Because of the small size of the domestic industry producing these products, specifics concerning the market participants and their future plans are confidential.

Views of Commissioner Eckes

In this investigation, I concur with the negative determinations of a majority of the Commission, except for imports of cast steel valve parts. Regarding the latter item, it is clear, as the majority notes, that such imports are increasing and that the domestic industry producing valve parts is experiencing serious injury. However, unlike my colleagues, I determine that the increased imports of valve parts are a substantial cause of serious injury to the domestic industry producing cast steel valve parts. Consequently, these dissenting views will concentrate on this point of dispute, the causation issue.

Imports of valve parts increased their market share sharply in 1982, rising from 15.6 percent in 1981 to 26.4 percent in 1982. In 1983, as apparent U.S. consumption of valve parts contracted sharply, import share declined to 20.8 percent, a market share larger than imports held in 1981. Consumption began to recover in 1984 and 1985; in the face of that recovery, import market share sharply increased to their highest levels--28.6 percent in 1984 and 28.4 percent in 1985. Absolute levels of imports doubled from 1983 to 1985. Thus, unlike import trends for other products in this investigation where declining demand has been a factor in the market, these penetrations are sizable and remain larger than for the period preceding any contraction in demand.

It is clear to me from these data that imports are an important cause of the serious injury the industry is experiencing. Unlike my colleagues, I also believe that imports are a cause more important than any other cause of the industry's problems. In reaching their negative determination, the majority may have focused too extensively on the consumption cycle. Although consumption did plummet in 1983, and then turned slowly upward during the next two years, the domestic industry has not shared in that upturn. During the period 1983-1985, import penetration increased almost 8 percentage points--to a level 13 percentage points higher than 1981 levels. At the same time the performance of this seriously injured industry has improved only marginally, remaining below 1981 and 1982 levels.

It is true that changes in demand for valve parts have resulted from problems in the petroleum industry, the primary consumer of such parts. But this decline in demand occurred in 1982 and 1983, while the sharp rise in import penetration occurred in 1984 and 1985. As I discussed in my dissenting views in Potassium Permanganate,

> "Neither the statute nor the legislative history establishes a time-frame for considering serious injury. Thus, the Commission has discretion to determine the appropriate period based on the facts of each investigation. . . .It is evident from both the statute and Commission practice that the focus of the Commission's determination is on the impact of increasing imports and the performance of the industry. 1/

1/ Potassium Permanganate, Inv. No. TA-201-54, USITC Pub. 1682 (1985), Views of Commissioner Eckes, at 40.

In the present investigation, the most appropriate period for the focus of the Commission's causation analysis is the most recent three-year period. Since the downturn occurred in 1982 and 1983, imports have increased their market share by nearly 8 percentage points. Imports have increased both absolutely and relatively during the period in which the industry has been experiencing serious injury. These trends in the most recent periods have been inconsistent with historical patterns.

Also, data on oil industry capital outlays indicate a 60 percent reduction for the period 1981-1986 on such outlays. By comparison, apparent U.S. consumption of valve parts has shown a 50 percent increase since 1983. Thus, oil industry trends alone cannot explain adequately changes in consumption levels for this industry.

Such consumption changes, sometimes described as responding to "recessionary pressures," are often merely the aggregation of many marketplace forces. Moreover, as I concluded in my views in Heavyweight Motorcycles:

> Without a doubt the unusual length and severity of the present recession has created unique problems for the domestic motorcycle industry. Without a doubt the rise in joblessness, particularly among blue-collar workers, who constitute the prime market for heavyweight motorcycles, has had a severe impact on the domestic industry. Nonetheless, if the Commission were to analyze the causation question in this way, it would be impossible in many cases for a cyclical industry experiencing serious injury to obtain relief under section 201 during a recession. In my opinion Congress could not have intended for the Commission to interpret the law this way. 2/

2/ Heavyweight Motorcycles, and Engines and Power Train Subassemblies Therefor, Inv. No. TA-201-47, USITC Pub. 1342 (1983), Views of Chairman Eckes, at 14-15.

In this investigation, it is evident that imports have taken advantage of the contraction in domestic demand, and have captured and maintained a larger and increasing share of the market than they held before the impact of other market forces.

INFORMATION OBTAINED IN THE INVESTIGATION

Introduction

Following receipt of a petition filed on December 2, 1985, and amended on December 12, 1985, and December 18, 1985, on behalf of the Cast Metals Federation, the U.S. International Trade Commission instituted investigation No. TA-201-58 under section 201(b)(1) of the Trade Act of 1974 to determine whether the following metal castings, whether or not advanced beyond cleaning, and whether or not machined beyond the removal of fins, gates, sprues, and risers or to permit location in finishing machinery, are being imported into the United States in such increased quantities as to be a substantial cause of serious injury, or the threat thereof, to the U.S. industry producing articles like or directly competitive with the imported articles:

- Iron castings and ductile iron castings:
  - Construction castings, specifically, manhole covers, rings, and frames, catch basin grates and frames, cleanout covers and frames, and valve, service, and meter boxes, provided for in items 657.09, 657.10, and 657.25 of the Tariff Schedules of the United States (TSUS);
  - Pressure pipe fittings for water mains, provided for in TSUS items 610.62, 610.63, 610.70, 610.71, 610.74, and 610.82;
  - Housings for compressors, provided for in TSUS item 661.10; and
  - Brake drums and rotors, provided for in TSUS items 692.32 and 692.33.
- Steel castings:
  - Parts of valves, including the bodies (or "shells"), bonnets, stems, wedges, handles, and seat rings, provided for in TSUS items 680.17, 680.25, and 680.27; and
  - Parts for construction equipment, tractors, and trucks, specifically:
    - Axle parts, including housings and spindles, for off-highway heavy construction vehicles, provided for in TSUS item 664.08;
    - Levers for front-end loaders and crawler tractors, provided for in TSUS item 664.08;
    - Drive sprockets for track-laying construction machinery and track-laying tractors, provided for in TSUS items 664.08, 692.34, and 692.35;
    - Beam hanger brackets for class 6, 7, and 8 on-highway trucks, provided for in TSUS items 692.32 and 692.33; and
    - Sockets and suspension brackets for 5-ton military trucks, provided for in TSUS item 692.32.
- Bronze castings:
  - Ship propellers, provided for in TSUS items 657.35, 678.50, and 696.15.

The amendments to the petition principally expand the scope of the petition to include imports from Canada of certain covered products that enter duty free as original motor-vehicle equipment and, with respect to all covered products, imports that have been machined.

Notice of the Commission's institution of its investigation and the scheduling of a public hearing to be held in connection therewith was given by posting copies of the notice in the Office of the Secretary, U.S. International Trade Commission, Washington, DC, and by publishing the notice in the Federal Register of January 2, 1986 (51 F.R. 130). 1/ The public hearing was held in Washington, DC, on March 18 and 19, 1986. 2/ The Commission must report its determination(s) and recommendations in connection with this investigation to the President by June 2, 1986.

Previous Commission Investigations

Some of the products subject to this investigation were included among the products subject to the Commission's investigation No. 332-176, Competitive Assessment of the U.S. Foundry Industry, USITC Publication 1582, September 1984. Investigation No. 332-176, conducted under section 332(g) of the Tariff Act of 1930, was instituted by the Commission on January 19, 1984, in response to a request from the United States Trade Representative, at the direction of the President. The investigation examined the competitive position of the U.S. foundry industry in domestic and world markets and included an overview of the U.S. foundry industry, together with a detailed analysis of selected key products that were considered to be representative of major segments of the industry in terms of manufacturing process, shipments, import competition, marketing, and financial condition. Among the selected key products in investigation No. 332-176 were iron construction castings, cast-iron pipe and tube fittings of all types and sizes, cast-iron compressor housings for compressors rated 10 horsepower and under, and certain cast-steel valves and parts thereof. Accordingly, several of the product categories in this investigation under section 201 of the Trade Act of 1974 were partially or wholly included among the specific key products studied in investigation No. 332-176.

Only one of the product categories in this investigation, iron and ductile iron construction castings, has been the subject of previous Commission investigations other than investigation No. 332-176. A discussion of the several investigations conducted on iron construction castings appears in appendix C.

Discussion of Report Format

This report is organized into three major parts on the basis of product groupings. Each of the parts presents information collected on the U.S. industry or industries producing castings like or directly competitive with imported castings subject to the investigation. Part I, entitled "Certain Iron Castings," covers the subject construction castings, pressure pipe fittings, compressor housings, and brake drums and rotors. Part II, entitled "Certain Steel Castings," covers the subject steel valve parts and, separately, the subject steel parts for construction equipment, tractors, and trucks. Part III, entitled "Bronze Ship Propellers," covers only bronze ship propellers. In addition, the introductory portion of the report contains an

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1/ A copy of the Commission's notice is presented in app. A.
2/ A list of witnesses appearing at the hearing is presented in app. B.

overview of the castings process and the U.S. foundry industry as well as discussions on foreign industries, exchange rates, and other topics that are not product specific.

The information in this report was obtained from responses to the Commission's questionnaires and from secondary data sources. Questionnaires were sent to 142 U.S. firms believed to produce the subject iron castings, 106 U.S. firms believed to produce the subject steel castings, and 22 U.S. firms believed to produce bronze ship propellers. Questionnaires were also sent to over 500 firms believed to import one or more of the subject castings and to 25 major purchasers of selected castings. The data obtained from the Commission's questionnaires are for the last 5 full years, 1981-85.

Overview on Castings and on the U.S. Foundry Industry

Castings

Casting is a manufacturing process by which liquid metal is poured or injected into a mold cavity, allowed to cool and solidify, and then released from the mold for finishing and use. It is a widely used method of manufacturing metal products because it affords the producer significantly larger options in terms of product size, constituent materials, surface texture, complexity of design, and shape than other metal-forming methods such as metal forging and stamping.

Sand casting 1/ is the simplest and the most widely used casting process, accounting for more than 90 percent of all metal poured. The sand-casting method can be employed in producing all types of ferrous and nonferrous castings and is generally the least expensive method of producing foundry products. This process also affords a great variety in size and complexity of castings poured but it is dimensionally less accurate and slower than other casting methods.

Briefly, sand casting involves making a mold by forming an indention in a flask of sand with a pattern bearing the external shape of the final casting, filling the mold with molten metal, and allowing the metal to cool and solidify. 2/ Each mold consists of two flasks of sand--the "cope" with the pattern of the casting's top half and the "drag" with the pattern of the bottom half. After the sand has been packed in firmly, the patterns are removed and the cope and drag are joined in such a way that an internal cavity having the shape of the entire casting is created. Some castings have inner surfaces that are formed with sand "cores" inserted into the cavity before the cope and drag are closed. Molten metal is poured into the mold cavity via a hole ("sprue") cut through the sand. After the metal solidifies and cools,

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1/ The sand used in this production process consists of selected sand that has been processed and sized; the sand is generally mixed with water-based or organic binders for use in the casting process.

2/ Molding equipment differs from foundry to foundry, but jolt-squeeze molding machines are among the most commonly used casting machines. These pneumatic machines press the sand into flasks. Special facing sands are used against the pattern while backing sand is used to fill the flask.

the casting is removed from the sand using a shaker machine, 1/ and the sand from the molds and cores is reprocessed for further use. The casting is then particle blasted or ground to remove rough edges and overpourings.

Green sand molding is the most frequent sand-casting method used in foundries for the production of subject products. The properties of green sand (sand mixed with a water-base binder such as bentonite) are adjustable within wide limits, allowing it to be used with all types of molding equipment, including high-pressure molding machinery. Large, heavy castings such as iron construction castings are typically made by the green-sand method. A variation of sand casting used for some of the lighter castings is the shell-mold process that is similar to the green-sand method, except that the cores are made of resin-treated sand and baked. There are several other sand-casting methods including hard-sand casting and oil-sand casting.

Nonsand casting methods include plaster-mold casting, investment casting, permanent-mold casting, and die casting. Each of these methods has its particular advantages and disadvantages with regard to dimensional accuracy, surface quality, complex configurations, size and weight limitations, tooling costs, and other criteria.

Modern casting methods have become increasingly complex. However, despite several advances in foundry technology, most casting techniques still produce metal products at a slower rate than rolling, stamping, and other metal-working production processes. But no other process allows a greater variety of shapes, intricacy of design, or closer dimensional tolerance. 2/

Castings are widely used in virtually all types of transportation equipment and machinery, as well as in building construction and water and sewer systems. Demand for castings is directly influenced by the degree of activity in the end-use sectors. 3/

The U.S. foundry industry

The U.S. foundry industry is composed of those firms that manufacture metal products by means of the casting process. 4/ It is estimated that there are over 3,000 foundries in the United States that collectively produce a large and diverse array of products (perhaps as many as 100,000 distinct

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1/ The shakeout machine can be a vibrating deck or grate, shaker pan conveyor, or any other type of vibratory machine. Often the shakeout operation is combined with a means of conveying the casting to the next location.

2/ There have been a number of labor-saving technological improvements in sand casting, including semiautomatic machines with high-pressure hydraulic squeezes, which are standard in most modern plants, automatic impact-type molding machines, and computer-controlled fully automatic molding machines.

3/ 1986 Industrial Outlook, Prospects for Over 350 Industries, U.S. Department of Commerce, January 1986.

4/ The industry does not include those firms that cast metal into semifinished forms for subsequent rolling or drawing into finished products, such as plates, sheets, or wire.

products), ranging in size from very small artificial heart valves to presses and mill frames weighing more than 200 tons. Castings are sometimes used as produced, but more often are machined or heat treated and used as components of assembled products. They are used in many manufactured goods and in virtually all machinery used in manufacturing.

There are two basic types of foundries: production foundries, which concentrate production within a limited product and size range and manufacture castings at relatively high volumes, and contract or jobbing foundries, which produce small amounts of a large variety of castings. Jobbing foundries predominate in terms of numbers, as 80 percent of U.S. foundries employ fewer than 100 workers. Both types of foundries are located throughout the United States, with a concentration of facilities in the Great Lakes area. Major producing States for ferrous foundry products are Michigan, Ohio, and Pennsylvania, which together accounted for 38 percent of ferrous castings shipments in 1983. In recent years, the foundry industry has undergone unprecedented contraction, with more than 500 foundries closing since 1980, of which more than 250 manufactured ferrous castings. 1/ Selected data on iron and steel foundries and foundry products are presented in table 1.

Foundries may also be classified by the type of metal cast, i.e., iron, steel, bronze, and other nonferrous metals. Rarely do foundries produce both iron and steel castings or a combination of either iron or steel castings and nonferrous castings. In this investigation, only two foundries reported producing castings of more than one type of metal. However, within a particular foundry, any number of products may be produced.

In general, producers of the four iron foundry products subject to this investigation tend to be production foundries, and the subject products account for a large percentage of their output. However, combinations of construction castings, pipe fittings for water mains, compressor housings, and brake drums and rotors are unusual; only six foundries reported producing castings of more than one of the four iron products.

On the other hand, manufacturers of the steel castings subject to the investigation tend to produce a wide variety of steel products. There is a distinction between foundries producing cast-steel parts of valves and those foundries producing one or more of the cast-steel parts for construction equipment, tractors, and trucks; only two foundries produce both cast-steel parts of valves and cast-steel parts for construction equipment, tractors, and trucks. However, two of the seven major producers of cast-steel parts for construction equipment, tractors, and trucks manufacture four of the five subject products included in that category, and two others each produce two of the products.

Manufacturers of bronze ship propellers are highly specialized—most do not produce other bronze castings, although some do manufacture other marine products.

1/ 1986 Industrial Outlook, Prospects for Over 350 Industries, U.S. Department of Commerce, January 1986.

Table 1.--U.S. iron and steel foundries: Selected industry 1/ and product 2/ data, 1981-85

Item	1981	1982	1983	1984	1985
Industry data: 1/					
Value of shipments million dollars---	12,947	9,641	9,280	3/ 11,025	3/ 10,897
Total employment 1,000 employees---	207	157	138	3/ 147	3/ 141
Production workers 1,000 employees---	168	124	109	3/ 120	3/ 115
Average hourly earnings of production workers---	$9.40	$10.13	$10.67	$11.10	$11.55
Product data: 2/					
Value of shipments million dollars---	13,034	9,632	9,192	3/ 10,921	3/ 10,795
Shipments price index (1982=100)---	95.0	100.0	102.3	104.3	107.4

1/ Includes data on all operations of companies whose principal line of business is iron and steel castings.
2/ Includes data on shipments of foundry products from all companies, whether or not their principal line of business is iron and steel castings.
3/ Estimated.

Source: 1986 Industrial Outlook, Prospects for Over 350 Industries, U.S. Department of Commerce, January 1986.

In this investigation, the petitioners have taken the approach of selecting 11 specific foundry products that they felt were particularly affected by competition from imports and alleging that there are 11 domestic industries producing like or directly competitive products. Those parties in opposition to the petition that have commented on the definition of the domestic industry have agreed that there are at least 11 domestic industries producing articles like or directly competitive with the 11 imported products. 1/ However, the petitioners have argued that the Commission should examine U.S. industry data for the specific products subject to the investigation, 2/ whereas parties in opposition have argued that because of the difficulty of making the allocations required to provide certain product-specific data, it is necessary and appropriate to examine the total foundry operations of producers of the subject products. 3/

1/ See for example prehearing brief of Korea Foundry & Forging Cooperative Association, p. 6; prehearing brief of Brazilian Foundry Association, pp. 29-30; prehearing brief of Hitachi Metals America, pp. 6-7; and prehearing brief of J.I. Case Co., pp. 1-7.
2/ Posthearing brief of petitioners, pp. 32-34.
3/ See for example posthearing brief of H. Bowen Co., Inc., pp. 3-6; posthearing brief of Canadian Foundry Association, pp. 17-18; and prehearing brief of Hitachi Metals America, pp. 7-10.

As previously stated, most manufacturers of the subject products also produce other castings of the same type of metal in the same facilities, utilizing the same labor and capital resources in the production of covered and noncovered products. Consequently, certain data, particularly those on capacity, employment, and profitability, are generally maintained only for total plant operations, and allocations must be made in order to report data on a product line basis. To the extent possible, data in this report are presented for covered products as well as for other castings of the same metal that are produced by the same firms producing the covered products.

The petitioners contend that the domestic industries consist of foundries that produce the castings or, in some cases, machine (or otherwise advance) the castings. They further contend that the domestic industries do not include machine shops or other entities that advance but do not produce the castings. Some respondents have disagreed, arguing that some of the imported products, notably brake drums and rotors, are often more advanced than the U.S. product as sold by the foundries and, therefore, the domestic industries should include machine shops as well as foundries. The staff has collected data on U.S. production and imports of both rough and machined castings for each product. For the most part, both the domestic and imported products were comparable in terms of the degree of machining; differences are explained and analyzed in the sections of the report that pertain to the products in question.

Imports From Designated Caribbean Basin Countries

In addition to its determination under section 201 of the Trade Act of 1974, the Commission is required by the Caribbean Basin Economic Recovery Act (CBERA) to make findings on whether and to what extent its findings and recommendations apply to imports of the subject products from certain countries in the Caribbean Basin area. The CBERA created a program of nonreciprocal tariff preferences granted by the United States to developing countries in the Caribbean Basin area to aid their economic development by encouraging greater diversification and expansion of their production and exports. The CBERA, as enacted in title II of Public Law 98-67 and implemented by Presidential Proclamations Nos. 5133 of November 30, 1983, and 5142 of December 29, 1983, provides duty-free entry to eligible articles imported directly from designated countries in the Caribbean Basin area. 1/ The CBERA applies to merchandise entered, or withdrawn from warehouse for consumption, on or after January 1, 1984, and is scheduled to remain in effect until September 30, 1995.

1/ The designated CBERA beneficiary countries are as follows: Antigua and Barbuda, Aruba, Barbados, Belize, Costa Rica, Dominica, Dominican Republic, El Salvador, Grenada, Guatemala, Haiti, Honduras, Jamaica, Montserrat, Netherlands Antilles, Panama, Saint Christopher-Nevis, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago, and the British Virgin Islands.

Section 213(e)(2) of title II of Public Law 98-67 provides the following:

> In any report by the International Trade Commission to the President under section 201(d)(1) of the Trade Act of 1974 regarding any article for which duty-free treatment has been proclaimed by the President pursuant to this title, the Commission shall state whether and to what extent its findings and recommendations apply to such article when imported from beneficiary countries.

No imports of the subject products from designated Caribbean Basin countries have been reported.

Imports From Israel

The Commission is also required by the United States-Israel Free Trade Area Implementation Act of 1985 to make findings on whether and to what extent its findings and recommendations apply to imports of the subject products from Israel. On April 22, 1985, representatives of the United States and Israel signed an "Agreement on the Establishment of a Free Trade Area between the Government of the United States and the Government of Israel." This agreement, authorized in title IV of Public Law 98-573, provides for the reduction or elimination of duties applicable to certain articles imported from Israel. The agreement applies to merchandise entered, or withdrawn from warehouse for consumption, on or after September 1, 1985, and is scheduled to remain in effect indefinitely.

Section 403(b) of title IV of Public Law 98-573 provides the following:

> In any report by the United States International Trade Commission to the President under section 201(d)(1) of the Trade Act of 1974 regarding any article for which a reduction or elimination of any duty is provided under a trade agreement entered into with Israel under section 102(b)(1) of the Trade Act of 1974, the Commission shall state whether and to what extent its findings and recommendations apply to such article when imported from Israel.

The only product subject to this investigation that reportedly may be imported from Israel is cast-steel parts of valves. Counsel for the Government of Israel Trade Center submitted a letter on March 28, 1986, urging the Commission to find that any injury to the domestic valve castings industry has not resulted from the reduction or elimination of duties applicable to imports from Israel and that such imports are not a substantial cause of injury or threat of injury to the domestic industry producing a like or directly competitive product. The Trade Center pointed out in its letter that imports of these products from Israel were already receiving duty-free treatment under the Generalized System of Preferences and that the U.S.-Israel agreement did not go into effect until September 1985.

The Foreign Industries

The Commission obtained limited data on foreign producers' capacity, production, home-market shipments, and exports of the subject products from telegrams and from counsel for various foreign producers. For the most part, such data were reported in less detail than requested and for broader product categories than those covered by the investigation. An analysis of such data, reported by country, follows.

Brazil

Data on the Brazilian foundry industry were reported for all iron castings, all steel castings, and all nonferrous castings (table 2). Capacity to produce iron and steel castings declined from 1981 to 1983 and then increased from 1983 to 1985. Capacity to produce nonferrous castings was constant during 1981-85. Production of the three categories of castings fell from 1981 to 1983 and then rose from 1983 to 1985. Capacity utilization with respect to iron castings dropped from * * * percent in 1981 to * * * percent in 1983 and then increased to * * * percent in 1985. Capacity utilization with respect to steel castings similarly decreased from * * * percent in 1981 to * * * percent in 1983 and then rose to * * * percent in 1985. Utilization of capacity to produce nonferrous castings was constant at about * * * percent during 1981-83 and then increased to * * * percent in 1985.

Shipments to the Brazilian market followed the same trend as production and accounted for * * * percent or more of total shipments of each of the three categories of castings. Brazil's exports of iron castings increased by * * * percent during 1981-85, whereas exports of steel castings were relatively constant. Exports of nonferrous castings increased by * * * percent from 1981 to 1982 and then stabilized. Brazil's exports of all metal castings to the United States * * * from 1981 to 1985, accounting for * * * percent of total exports in 1985. Exports to other countries declined by * * * percent from 1981 to 1983 and then rose by * * * percent from 1983 to 1985.

Canada

Data on the Canadian foundry industry were reported for all iron and all steel castings (table 3). The value of production of iron castings grew steadily from 1981 to 1984 and then dropped in 1985. Production of steel castings declined in value from 1981 to 1983, increased in 1984, and fell again in 1985. Capacity utilization with respect to iron castings dropped from 62 percent in 1981 to 52 percent in 1982, rose to 68 percent in 1984, and then decreased to 62 percent in 1985. Utilization of capacity to produce steel castings decreased from 60 percent in 1981 to 50 percent in 1982 and 1983, climbed to 58 percent in 1984, and then fell to 52 percent in 1985.

Table 2.--Iron, steel, and nonferrous castings: Brazilian capacity, production, capacity utilization, home-market shipments, and exports, 1981-85 1/

Item	1981	1982	1983	1984	1985
Capacity: 2/					
Iron castings--1,000 tons	***	***	***	***	***
Steel castings--do	***	***	***	***	***
Nonferrous castings--do	***	***	***	***	***
Production:					
Iron castings--do	***	***	***	***	***
Steel castings--do	***	***	***	***	***
Nonferrous castings--do	***	***	***	***	***
Capacity utilization:					
Iron castings--percent	***	***	***	***	***
Steel castings--do	***	***	***	***	***
Nonferrous castings--do	***	***	***	***	***
Shipments:					
Home-market:					
Iron castings 1,000 tons	***	***	***	***	***
Steel castings--do	***	***	***	***	***
Nonferrous castings do	***	***	***	***	***
Exports: 3/					
Iron castings--do	***	***	***	***	4/ ***
Steel castings--do	***	***	***	***	4/ ***
Nonferrous castings do	***	***	***	***	4/ ***
Total shipments:					
Iron castings--do	***	***	***	***	***
Steel castings--do	***	***	***	***	***
Nonferrous castings do	***	***	***	***	***
Exports of all metal castings to--					
United States 1,000 dollars	***	***	***	***	5/ ***
Other countries--do	***	***	***	***	5/ ***
All countries--do	***	***	***	***	5/ ***

1/ Except as noted, data were reported on the basis of metric tons and converted to short tons (1 metric ton = 2,204.62 pounds or 1.10231 short tons).
2/ Reported on the basis of "effective" capacity rather than "theoretical" capacity.
3/ Exports of iron, steel, and nonferrous castings by country are not available.
4/ Projected on the basis of January-September data.
5/ Projected on the basis of January-November data.

Source: Report from U.S. Embassy, Sao Paulo, 1986.

Table 3.—Iron and steel castings: Canadian production, capacity utilization, and exports, 1981-85

Item	1981	1982	1983	1984	1985
Production:					
Iron castings million dollars	530	547	655	750	660
Steel castings million dollars	263	198	180	210	172
Capacity utilization:					
Iron castings—percent	62	52	58	68	62
Steel castings—do	60	50	50	58	52
Exports:					
Iron castings to:					
The United States—tons	85,248	62,055	73,037	87,151	80,434
Other countries—do	573	2,064	1,490	310	91
Total—do	85,821	64,119	74,527	87,461	80,525
Steel castings to:					
The United States—tons	4,159	4,264	3,919	7,209	3,758
Other countries—do	141	380	78	50	56
Total—do	4,300	4,644	3,997	7,259	3,814

Source: Report from U.S. Embassy, Ottawa, 1986.

Canada's exports of iron castings to the United States fluctuated during 1981-85, from a low of 62,000 tons in 1982 to a high of 87,000 tons in 1984, and accounted for more than 96 percent of total iron castings exports in each of the 5 years. Exports of steel castings to the United States, which accounted for more than 91 percent of total exports of steel castings in each year, were approximately 4,000 tons annually during 1981-85 except during 1984 when 7,200 tons were exported to the United States.

Federal Republic of Germany

Data on the West German foundry industry were reported for all iron and steel castings combined for 1981-84 only (table 4). Production declined irregularly during 1981-84, dropping by 8 percent overall. Home-market shipments, which accounted for 82 to 84 percent of total shipments, followed a similar trend, decreasing by 12 percent overall. Exports increased by 8 percent during the same period. Capacity data were not provided; however, the number of foundries in West Germany declined steadily from 560 in 1981 to 476 in 1985.

Table 4.—Iron and steel castings: 1/ Federal Republic of Germany production, home-market shipments, exports, inventories, number of producers, and employment, 1981-84 2/

Item	1981	1982	1983	1984
Production—1,000 tons	4,061	3,859	3,651	3,734
Home-market shipments—do	3,364	3,168	2,954	2,968
Exports—do	618	628	617	670
Total shipments—do	3,982	3,796	3,571	3,638
Inventories—do	1,021	804	845	862
Number of producing firms 3/	560	537	501	476
Employment 3/	4/	4/	79,879	75,867

1/ Includes other castings in addition to those subject to this investigation.

2/ Tonnage data were reported on the basis of metric tons and converted to short tons (1 metric ton = 2,204.62 pounds or 1.10231 short tons).

3/ Data are for all foundries, not just those producing products subject to this investigation.

4/ Not available.

Source: Report from U.S. Embassy, Bonn, 1986.

France

Data on the French foundry industry were reported for all iron castings, all steel castings, and all bronze castings for 1981-84 only (table 5). Production of iron and steel castings declined by 39 percent and 33 percent, respectively, during 1981-84, and production of bronze castings fell by 20 percent during 1982-84. Home-market shipments, which accounted for an average of 86 percent of French production of iron and bronze castings and 65 percent of production of steel castings, followed a similar trend. Total exports of iron castings increased by 52 percent during 1981-84, whereas exports of steel castings decreased by 19 percent during the same period. Exports of bronze castings rose slightly from 1982 to 1983 and then fell by 13 percent in 1984. Capacity data were not provided; however, the number of foundries in France declined steadily from 777 in 1981 to 682 in 1984, and employment dropped by 21 percent.

Table 5.—Iron, steel, and bronze castings: 1/ French production, home-market shipments, exports, number of producers, and employment, 1981-84

Item	1981	1982	1983	1984
Production: 2/				
Iron castings------tons--	64,639	57,203	49,010	39,131
Steel castings------do----	222,177	198,821	156,985	149,745
Bronze castings------do----	3/	5,914	4,937	4,751
Home-market shipments: 2/				
Iron castings------do----	56,646	50,417	42,963	30,947
Steel castings------do----	139,805	129,118	106,919	98,515
Bronze castings------do----	3/	5,174	4,274	4,045
Exports: 2/				
Iron castings------do----	5,512	5,801	6,198	8,401
Steel castings------do----	54,515	50,188	42,518	44,321
Bronze castings------do----	3/	388	396	344
Number of producing firms 4/------	777	760	726	682
Number of production workers 4/------	64,105	61,764	56,833	50,900

1/ Includes other castings in addition to those subject to this investigation.
2/ Data were reported on the basis of metric tons and converted to short tons (1 metric ton = 2,204.62 pounds or 1.10231 short tons).
3/ Not available.
4/ Data are for all foundries, not just those producing products subject to this investigation.

Source: Report from U.S. Embassy, Paris, 1986.

Japan

Limited data on Japanese production and exports were provided for product categories that are broader than those covered by the investigation but narrower than all iron, steel, and bronze castings (table 6). Production of iron castings for automobiles increased irregularly from 2.1 million tons in 1981 to 2.4 million tons in 1985. Production of steel valve castings generally decreased during the period, ranging from a high to 84,000 tons in 1982 to a low of 50,000 tons in 1983. Steel castings production for civil engineering, construction, and mining equipment fell steadily from 162,000 tons in 1981 to 117,000 tons in 1985. Finally, production of copper alloy castings for shipbuilding and harbor equipment fluctuated within a fairly narrow range of 15,000 to 18,000 tons during 1981-85.

Table 6.—Certain metal castings: 1/ Japanese production and exports, 1981-85

Item	1981	1982	1983	1984	1985
Production:					
Iron castings for automobiles————1,000 tons—	2,145	2,017	2,085	2,268	2,409
Steel valve castings 1,000 tons—	76	84	50	54	63
Steel castings for civil engineering, construction, and mining equipment———1,000 tons—	162	160	137	117	117
Copper alloy castings for shipbuilding and harbor equipment———1,000 tons—	18	16	15	18	17
Exports of marine propellers 2/ to—					
The United States———tons—	149	84	74	241	495
Other countries————do———	3,673	3,581	2,921	4,150	3,624
Total————————do———	3,822	3,665	2,995	4,391	4,119

1/ Includes other castings in addition to those subject to this investigation.
2/ Includes propellers of other metals besides bronze.

Source: Report from U.S. Embassy, Tokyo, 1986.

Japanese exports of all marine propellers (including bronze) to the United States declined by 50 percent from 1981 to 1983 and then increased more than fivefold from 1983 to 1985. Such exports to the United States accounted for less than 6 percent of total marine propeller exports during 1981-84 and 12 percent in 1985. No other relevant export data were available.

People's Republic of China

Table 7 provides data on exports of iron construction castings and cast-steel truck and machinery components from the People's Republic of China (China). Exports of iron construction castings to the United States increased from 670 tons, or 1 percent of total exports in 1981 to 15,500 tons, or 18 percent of total exports, in 1985. Exports of this product to other countries declined from 1981 to 1982, increased from 1982 to 1984, and fell again in 1985. Cast-steel truck and machinery components were exported in much smaller quantities. Exports to the United States rose from 28 tons in 1981 to 565 tons in 1982 and then decreased steadily to 10 tons in 1985. Exports to other countries increased steadily from 55 tons in 1981 to 551 tons in 1985.

Table 7.—Iron construction castings and cast-steel truck and machinery components: Exports 1/ from the People's Republic of China, 1981-85

Item	1981	1982	1983	1984	1985
Exports of iron construction castings to—					
The United States——tons—:	670	3,384	6,340	13,694	15,500
Other countries————do———:	74,446	64,128	74,489	87,130	68,324
Total——————————do———:	75,116	67,512	80,829	100,824	83,824
Exports of cast-steel truck and machinery components to—					
The United States——tons—:	28	565	106	42	10
Other countries————do———:	55	77	331	360	551
Total——————————do———:	83	642	437	402	561

1/ Data were reported on the basis of metric tons and converted to short tons (1 metric ton = 2,204.62 pounds or 1.10231 short tons).

Source: Report from U.S. Embassy, Beijing, 1986.

Republic of Korea

Korean industry data were provided for two specific products subject to this investigation—cast-iron pressure pipe fittings for water mains and cast-steel valve parts (table 8). Capacity to produce pressure pipe fittings for water mains increased by * * * percent from 1981 to 1985. Production of such pipe fittings rose nearly * * * during the same period, and capacity utilization increased from * * * percent in 1981 to * * * percent in 1984 before dropping slightly to * * * percent in 1985. Home-market shipments increased nearly * * * from 1981 to 1983 and then leveled off. Such shipments accounted for a steadily decreasing share of total shipments, falling from * * * percent in 1981 to * * * percent in 1985. Exports of such pipe fittings to the United States were more than * * * times as great in 1985 as those in 1981. The United States has been Korea's largest export market for this product. Other export markets, which accounted for * * * percent of total exports in 1983 and * * * percent in 1984, all but disappeared in 1985 when exports to the United States accounted for * * * percent of the total.

Capacity to produce cast-steel valves and parts of valves increased by * * * percent from 1981 to 1985. Production declined slightly from 1981 to 1982 and then * * * during 1982-85, and capacity utilization increased from * * * percent in 1981 to * * * percent in 1985. Home-market shipments of valve parts followed a trend similar to that of production. Such shipments accounted for a steadily decreasing share of total shipments, falling from * * * percent in 1981 to * * * percent in 1985. Exports of valve parts to the United States were relatively constant from 1981 to 1983, then increased by * * * percent in 1984, and * * * in 1985. The United States has been Korea's

Table 8.--Pressure pipe fittings for water mains and valve parts: Korean capacity, production, capacity utilization, home-market shipments, and exports, 1981-85 1/

Item	1981	1982	1983	1984	1985
	Pressure pipe fittings for water mains 2/				
Capacity----------tons---	***	***	***	***	***
Production----------do---	***	***	***	***	***
Capacity utilization percent---	***	***	***	***	***
Shipments:					
Home-market----------tons---	***	***	***	***	***
Exports to--					
The United States---do---	***	***	2/ ***	2/ ***	2/ ***
Other countries-----do---	***	***	***	***	***
Total exports-----do---	***	***	***	***	***
Total shipments-----do---	***	***	***	***	***
	Valve parts 3/				
Capacity 4/----------tons---	***	***	***	***	***
Production 4/----------do---	***	***	***	***	***
Capacity utilization 4/ percent---	***	***	***	***	***
Shipments:					
Home-market----------tons---	***	***	***	***	***
Exports to--					
The United States---do---	***	***	***	***	***
Other countries-----do---	***	***	***	***	***
Total exports-----do---	***	***	***	***	***
Total shipments-----do---	***	***	***	***	***

1/ Data were reported on the basis of metric tons and converted to short tons (1 metric ton = 2,204.62 pounds or 1.10231 short tons).

2/ In a telephone conversation on May 7, 1986, counsel for the Korea Foundry & Forging Cooperative Association provided data on exports to the United States during 1983-85 of products that more closely conform to the description of the subject cast-iron pipe fittings. Such exports reportedly increased from * * * tons in 1983 to * * * tons in 1984 and * * * tons in 1985.

3/ Data may include other types of fittings not covered by the investigation.

4/ Data are for valves and valve parts.

Source: Compiled from data submitted by counsel for the Korea Foundry & Forging Cooperative Association.

largest export market for this product, accounting for * * * to * * * percent of total exports.

Spain

Table 9 provides data on Spain's exports of iron construction castings, pressure pipe fittings for water mains, and bronze ship propellers for 1981-84 only. Spain did not export construction castings or water main pipe fittings to the United States until 1984 when 35 tons of the former product and 21 tons of the latter product were exported. These quantities are insignificant relative to total exports to other markets. Bronze ship propellers were not exported to the United States during 1981-84.

Table 9.—Iron construction castings, pressure pipe fittings for water mains, and bronze ship propellers: Exports 1/ from Spain, 1981-84

Item	1981	1982	1983	1984
Exports of iron construction castings to—				
The United States—tons	0	0	0	35
Other countries—do	1,195	4,605	1,606	2,436
Total—do	1,195	4,605	1,606	2,471
Exports of pressure pipe fittings for water mains to—				
The United States—tons	0	0	0	21
Other countries—do	893	1,150	1,294	1,798
Total—do	893	1,150	1,294	1,819
Exports of bronze ship propellers to—				
The United States—1,000 US dollars	0	0	0	0
Other countries—do	217	305	148	337
Total—do	217	305	148	337

1/ Except as noted, data were reported on the basis of metric tons and converted to short tons (1 metric ton = 2,204.62 pounds or 1.10231 short tons).

Source: Report from U.S. Embassy, Madrid, 1986.

United Kingdom

Data on the steel foundry industry in the United Kingdom are presented in table 10. Capacity to produce steel castings in the United Kingdom decreased by 39 percent from 1981 to 1985, and production fell by 25 percent. Capacity utilization increased from 58 percent in 1981 to 71 percent in 1982 and then remained at about that level during 1983-85. Home-market shipments declined by 23 percent during 1981-85 but remained at about 80 percent of total shipments. Exports of steel castings to the United States dropped from 1981 to 1983 and then returned to slightly above the 1981 level in 1985, never exceeding 15 percent of total exports.

Table 10.—Steel castings: United Kingdom capacity, production, capacity utilization, home-market shipments, and exports, 1981-85

Item	1981	1982	1983	1984	1985
Capacity————1,000 tons—	267	217	168	168	162
Production————do———	155	154	116	117	116
Capacity utilization percent—	58.1	71.0	69.0	69.6	71.6
Shipments:					
Home-market————tons—	124,000	121,000	94,000	98,000	95,000
Exports to—					
The United States—do———	3,005	2,534	2,070	2,367	3,136
Other countries——do———	27,811	30,325	19,628	16,794	18,084
Total exports——do———	30,816	32,859	21,698	19,161	21,220
Total shipments——do———	154,816	153,859	115,698	117,161	116,220
Exports of cast-steel valve parts to—					
The United States——tons—	1,833	1,534	132	274	372
Other countries————do———	163	270	74	100	128
Total——————do———	1,996	1,804	206	374	500
Exports of cast-steel parts for construction equipment, tractors, and trucks to—					
The United States——tons—	58	74	73	314	618
Other countries————do———	871	1,418	2,051	913	1,086
Total——————do———	929	1,492	2,124	1,227	1,704

Source: Report from U.S. Embassy, London, 1986.

U.K. exports of cast-steel valve parts to the United States declined sharply from 1,833 tons in 1981 to 132 tons in 1983 and then increased to 372 tons in 1985. Exports to the United States accounted for 64 to 92 percent of total exports of this product during 1981-85. U.K. exports to the United States of cast-steel parts for construction equipment, tractors, and trucks increased from 58 tons, or 6 percent of total exports, in 1981 to 618 tons, or 36 percent of total exports, in 1985.

Exchange Rates

One of the factors considered in examining the competitive position of U.S. producers vis-a-vis foreign producers of the subject foundry products is the change in the exchange rates between the U.S. dollar and the currencies of the foreign supplying countries. Quarterly indexes of exchange rates and producer prices of the top 12 supplying foreign countries of the subject foundry products were compiled from data reported by the International Monetary Fund. 1/ During January 1981-December 1985 the nominal value of currencies of the 12 major supplying countries generally depreciated relative to the U.S. dollar, ranging from approximately 1 to 99 percent (table 11). 2/ Except for Japan and Taiwan, the high inflation rates in the other 10 countries relative to inflation in the United States over the 20-quarter period resulted in less of a real devaluation of their currencies compared with the nominal devaluations. In real terms, currency devaluations of the latter 10 countries ranged from approximately 2 to 32 percent relative to the U.S. dollar. 3/ The rates of inflation in Japan and Taiwan, however, were less than that in the United States over the same period, so that the yen and the New Taiwan dollar depreciated in real terms against the U.S. dollar by somewhat more than their nominal devaluations. In nominal terms, the Japanese yen depreciated by 0.7 percent against the U.S. dollar during January 1981-December 1985, but in real terms it depreciated by 10.3 percent. During this same period, the New Taiwan dollar depreciated against the U.S. dollar by 10.3 percent in nominal terms and 19.6 percent in real terms.

1/ The 12 foreign countries are Brazil, Canada, India, Italy, Japan, Korea, Mexico, Netherlands, Spain, Taiwan, United Kingdom, and West Germany.

2/ During the end of this period most of these foreign currencies appreciated somewhat against the U.S. dollar. This appreciation of the foreign currencies against the dollar may continue as the United States and some of its major trading partners agreed in September 1985 to intervene in the foreign exchange markets to reduce the value of the U.S. dollar. Such foreign currency appreciations could reduce the relative competitiveness of the subject foreign foundry products sold in the U.S. market.

3/ The real depreciation of the foreign currencies against the U.S. dollar from the reference period January-March 1981 indicates the maximum amount that a foreign foundry or its agent can reduce its dollar prices of the foreign foundry products in the U.S. market without increasing its profits assuming it has no dollar-denominated costs. A foreign producer, however, may choose to increase its profits by not reducing its dollar prices or by reducing its dollar prices by less than the depreciation would allow.

Table 11.—Exchange rates: 1/ Indexes of the nominal and real exchange rates between the U.S. dollar and currencies of 12 selected countries, and indexes of producer prices in the United States and the selected foreign countries, 2/ by quarters, January 1981–December 1985

Period	U.S. Producer Price Index	Brazil: Producer price index	Brazil: Nominal-exchange-rate index	Brazil: Real-exchange-rate index 3/	Canada: Producer price index	Canada: Nominal-exchange-rate index	Canada: Real-exchange-rate index 3/	India: Producer price index	India: Nominal-exchange-rate index	India: Real-exchange-rate index 3/	Italy: Producer price index	Italy: Nominal-exchange-rate index	Italy: Real-exchange-rate index 3/
			—US dollars/cruzeiro—			—US dol./CAN dol.—			—US dollars/rupee—			—US dollars/lira—	
1981:													
Jan.-Mar	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Apr.-June	102.2	119.7	84.4	98.8	102.2	99.6	99.6	104.3	96.5	98.5	105.1	88.3	90.8
July-Sept	102.9	138.2	71.0	95.4	104.4	98.5	99.9	107.3	90.3	94.2	108.9	82.4	87.3
Oct.-Dec	102.8	160.5	60.0	93.6	105.7	100.2	103.0	105.5	88.9	91.2	113.2	83.7	92.2
1982:													
Jan.-Mar	103.7	188.4	51.3	93.3	107.2	98.7	102.0	104.5	88.2	88.8	116.8	79.4	89.4
Apr.-June	103.8	227.5	44.2	96.8	109.3	95.9	100.9	104.9	86.7	87.6	119.2	75.9	87.2
July-Sept	104.3	269.1	37.3	96.4	110.1	95.5	100.8	109.5	84.8	89.0	123.1	71.9	84.8
Oct.-Dec	104.4	310.8	30.7	91.5	110.5	96.9	102.6	108.2	83.6	86.6	127.2	69.8	85.0
1983:													
Jan.-Mar	104.5	388.0	21.7	80.5	111.2	97.3	103.5	109.3	82.0	85.8	129.2	71.6	88.6
Apr.-June	104.8	513.0	14.9	72.8	112.9	97.0	104.5	113.9	81.1	88.1	131.3	67.8	85.0
July-Sept	105.8	734.9	11.1	77.0	113.8	96.8	104.2	118.1	79.9	89.2	134.3	63.6	80.8
Oct.-Dec	106.4	1,035.7	8.2	79.5	114.3	96.4	103.6	119.3	78.4	87.9	138.8	61.6	80.4
1984:													
Jan.-Mar	107.5	1,365.2	6.2	78.8	116.2	95.1	102.8	120.9	75.5	84.9	143.2	60.2	80.3
Apr.-June	108.2	1,813.6	4.7	78.3	117.6	92.3	100.3	123.0	73.9	84.0	146.4	59.8	80.9
July-Sept	107.9	2,420.0	3.5	79.2	118.3	90.8	99.5	128.7	70.1	83.5	148.3	55.6	76.4
Oct.-Dec	107.7	3,381.9	2.6	81.4	118.6	90.5	99.7	127.5	66.7	79.0	151.1	53.0	74.3
1985:													
Jan.-Mar	107.5	4,660.9	1.9	81.6	119.9	88.2	98.4	127.4	63.2	74.9	155.1	49.5	71.4
Apr.-June	107.6	5,960.7	1.4	75.0	120.6	87.2	97.7	132.1	64.9	79.7	158.6	50.8	74.9
July-Sept	106.8	7,829.0	1.0	76.3	120.9	87.8	99.3	135.2	67.3	85.2	158.5	52.8	78.4
Oct.-Dec	107.5	11088.4	0.8	81.1	121.7	86.5	98.0	133.9	67.1	83.6	166.2	57.2	88.5

See notes at the end of the table.

Table 11.—Exchange rates: 1/ Indexes of the nominal and real exchange rates between the U.S. dollar and currencies of 12 selected countries, and indexes of producer prices in the United States and the selected foreign countries, 2/ by quarters, January 1981–December 1985—Continued

Period	U.S. Producer Price Index	Japan: Producer price index	Japan: Nominal-exchange-rate index	Japan: Real-exchange-rate index 3/	Korea: Producer price index	Korea: Nominal-exchange-rate index	Korea: Real-exchange-rate index 3/	Mexico: Producer price index	Mexico: Nominal-exchange-rate index	Mexico: Real-exchange-rate index 3/	Netherlands: Producer price index	Netherlands: Nominal-exchange-rate index	Netherlands: Real-exchange-rate index 3/
			US dollars/yen			US dollars/won			US dollars/peso			US dollars/guilder	
1981:													
Jan.-Mar—	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Apr.-June–	102.2	101.1	93.4	92.4	105.8	98.0	101.4	106.1	97.5	101.3	102.1	90.4	90.2
July-Sept–	102.9	102.4	88.6	88.2	108.3	97.3	102.4	111.6	94.8	102.7	104.6	84.5	85.9
Oct.-Dec—	102.8	102.1	91.5	90.9	108.4	96.7	102.0	118.4	91.5	105.4	105.8	92.5	95.2
1982:													
Jan.-Mar—	103.7	102.5	88.0	87.0	110.0	93.9	99.6	132.3	68.4	87.2	108.6	88.7	92.8
Apr.-June–	103.8	102.8	84.2	83.3	110.4	91.6	97.4	152.8	50.2	73.9	109.7	86.6	91.5
July-Sept–	104.3	103.8	79.4	79.0	110.8	90.0	95.6	181.9	33.0	57.6	110.7	83.7	88.8
Oct.-Dec—	104.4	103.7	79.2	78.6	111.1	89.6	95.4	213.8	32.0	65.6	110.7	83.4	88.4
1983:													
Jan.-Mar—	104.5	101.7	87.2	84.9	111.6	88.5	94.5	276.7	23.0	61.0	110.8	85.8	91.0
Apr.-June–	104.8	100.7	86.5	83.2	110.7	86.7	91.6	335.7	20.6	65.9	111.1	81.8	86.8
July-Sept–	105.8	100.9	84.7	80.8	110.4	84.9	88.6	378.9	18.6	66.7	112.7	77.2	82.3
Oct.-Dec—	106.4	100.3	87.7	82.7	110.4	83.9	87.1	420.6	17.0	67.3	112.9	76.0	80.7
1984:													
Jan.-Mar—	107.5	100.4	89.0	83.1	110.8	83.9	86.4	501.1	15.7	73.0	115.7	75.0	80.7
Apr.-June–	108.2	100.3	89.5	83.0	111.1	83.6	85.8	579.5	14.5	77.7	116.4	74.9	80.5
July-Sept–	107.9	101.1	84.4	79.1	112.1	82.3	85.5	628.4	13.5	78.7	117.1	69.4	75.3
Oct.-Dec—	107.7	100.8	83.6	78.2	112.2	81.4	84.8	695.9	12.6	81.7	117.3	66.3	72.2
1985:													
Jan.-Mar—	107.5	101.2	79.8	75.1	112.2	79.5	83.0	785.1	11.7	85.6	118.1	62.0	68.1
Apr.-June–	107.6	100.5	82.0	76.6	112.3	76.9	80.3	877.0	10.7	87.6	119.3	65.5	72.6
July-Sept–	106.8	99.4	86.1	80.1	112.5	75.6	79.6	950.3	8.6	76.1	118.9	71.2	79.3
Oct.-Dec—	107.5	97.1	99.3	89.7	113.2	74.8	78.8	1,036.4	7.0	4/ 67.9	117.6	78.4	4/ 85.8

See notes at the end of the table.

Table 11.--Exchange rates: 1/ Indexes of the nominal and real exchange rates between the U.S. dollar and currencies of 12 selected countries, and indexes of producer prices in the United States and the selected foreign countries, 2/ by quarters, January 1981–December 1985--Continued

Period	U.S. Producer Price Index	Spain: Producer price index	Spain: Nominal-exchange-rate index	Spain: Real-exchange-rate index 3/	Taiwan: Producer price index	Taiwan: Nominal-exchange-rate index	Taiwan: Real-exchange-rate index 3/	United Kingdom: Producer price index	United Kingdom: Nominal-exchange-rate index	United Kingdom: Real-exchange-rate index 3/	West Germany: Producer price index	West Germany: Nominal-exchange-rate index	West Germany: Real-exchange-rate index 3/
			--US dollars/peseta--			-US $s/New Taiwan $-			--US dollars/pound--			--US dollars/mark--	
1981:													
Jan.-Mar---	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Apr.-June--	102.2	105.3	92.2	95.0	100.6	99.1	97.5	103.3	90.4	91.4	102.5	91.7	91.9
July-Sept--	102.9	108.3	85.8	90.3	94.8	97.0	89.4	104.5	79.5	80.8	104.7	85.8	87.3
Oct.-Dec---	102.8	111.1	87.5	94.5	97.5	95.3	90.4	106.7	81.5	84.6	106.2	93.0	96.1
1982:													
Jan.-Mar---	103.7	115.2	83.1	92.3	100.3	95.1	91.9	109.5	80.0	84.4	108.1	89.9	93.7
Apr.-June--	103.8	118.3	79.3	90.3	100.6	93.0	90.2	111.2	77.0	82.5	109.1	87.7	92.2
July-Sept--	104.3	120.1	74.9	86.3	100.4	90.8	87.4	112.3	74.7	80.4	110.1	84.1	88.7
Oct.-Dec---	104.4	122.7	70.0	82.3	100.0	89.7	85.9	113.6	71.4	77.7	110.5	83.4	88.3
1983:													
Jan.-Mar---	104.5	130.5	64.7	80.8	98.2	90.3	84.9	115.2	66.3	73.2	110.2	86.7	91.4
Apr.-June--	104.8	134.2	60.5	77.5	98.9	90.0	85.0	117.5	67.3	75.5	110.5	84.0	88.6
July-Sept--	105.8	137.3	55.9	72.6	99.2	89.8	84.2	118.4	65.4	73.1	111.4	79.0	83.1
Oct.-Dec---	106.4	142.3	54.4	72.8	99.3	89.7	83.7	120.0	63.6	71.8	112.1	77.9	82.1
1984:													
Jan.-Mar---	107.5	148.3	54.4	75.1	99.6	89.8	83.2	122.0	62.1	70.5	113.1	77.2	81.3
Apr.-June--	108.2	152.2	55.0	77.3	100.2	90.7	84.0	124.9	60.5	69.8	114.0	77.0	81.1
July-Sept--	107.9	154.1	55.9	79.8	99.6	92.0	84.8	125.6	56.2	65.4	114.5	71.5	75.8
Oct.-Dec---	107.7	156.2	49.3	71.5	99.0	91.6	84.2	127.2	52.6	62.2	115.3	68.3	73.2
1985:													
Jan.-Mar---	107.5	161.8	46.7	70.3	98.1	91.7	83.7	129.3	48.3	58.1	116.5	64.1	69.5
Apr.-June--	107.6	164.4	48.3	73.8	97.3	90.6	81.9	131.9	54.4	66.7	117.0	67.6	73.5
July-Sept--	106.8	165.7	50.3	78.1	96.7	89.4	80.9	132.6	59.6	74.0	117.0	73.2	80.2
Oct.-Dec---	107.5	167.3	52.9	82.3	5/96.3	89.7	5/ 80.4	133.7	62.2	77.4	116.8	80.8	87.7

1/ Based on exchange rates expressed in U.S. dollars per unit of the subject foreign currency.

2/ The producer price indexes are aggregate measures of inflation at the wholesale level in the subject countries. As a result, these indexes may only approximate actual price changes of the subject foundry products in the respective countries. Producer prices in the United States increased by 7.5 percent during January 1981–December 1985 compared with increases in the same period of 10,988.4 percent in Brazil, 21.7 percent in Canada, 33.9 percent in India, 66.2 percent in Italy, 13.2 percent in Korea, 936.4 percent in Mexico, 17.6 percent in the Netherlands, 67.3 percent in Spain, 33.7 percent in the United Kingdom, and 16.8 percent in West Germany. In contrast, prices in Japan and Taiwan decreased by 2.9 and 3.7 percent, respectively, during the same period. Although the producer price index in Taiwan generally declined during the period, producer prices in Japan initially increased by 3.8 percent during January 1981–September 1982, but generally fell thereafter by 6.5 percent by December 1985.

3/ The real value of a currency is the nominal value adjusted for the difference between inflation rates as measured by the producer price index in the United States and in the foreign country.

4/ Derived from preliminary foreign producer price data for October and November only, the latest data available.

5/ Derived from preliminary Taiwan producer price data for October only, the latest data available.

Source: International Monetary Fund, International Financial Statistics, April 1985 and March 1986; Central Bank of China, Financial Statistics, November 1983 and December 1985.

Note.--January-March 1981=100.

CERTAIN IRON CASTINGS

Introduction

This part of the report presents information relating specifically to the following four iron foundry products:

iron construction castings (construction castings),
cast-iron fittings for water main pressure pipes (pipe fittings),
cast-iron compressor housings (compressor housings), and
cast-iron brake drums and rotors (brake drums and rotors).

The Products

Description and uses

Construction castings.—The iron construction castings covered by this investigation include manhole covers, rings, and frames; catch basin grates and frames; cleanout covers and frames; and valve, service, and meter boxes. These articles are cast primarily from gray iron, but are occasionally made of malleable or ductile iron. 1/

Iron construction castings may be divided into two categories—so called heavy castings, which usually have walls of 1 inch or greater thickness and generally range in weight from 270 to 1,000 pounds, and light castings, which typically have 1/4-inch thick walls and generally range in weight from 10 to 120 pounds. The heavy construction castings consist of manhole covers, rings, and frames; catch basin grates and frames; and cleanout covers and frames. These products are used for drainage or access purposes in utility, water, and sanitary systems. Manhole sets, consisting of a cover and a frame, and sometimes accessory parts such as rings, constitute the bulk of both U.S. production and imports of heavy construction castings. The light construction castings consist of valve, service, and meter boxes. These products are used to encase the underground valves and meters of water, gas, or other utilities, and to provide access to this equipment for periodic adjustment or reading. Light castings are also manufactured in sets, usually containing three pieces—a base, a top, and a cover with lettering and/or a pattern.

These construction products are usually made of gray iron, but other materials are being used in increasing amounts. The underground sections (and occasionally the covers) of valve, service, and meter boxes, for example, are

1/ Gray iron, the most widely used cast iron, has the majority of its carbon or graphite content in the form of flakes that are interspersed throughout the metal. Gray-iron products are brittle, having little or no ductility, but they have good wear resistance and high vibration absorption and can be machined easily. The graphite content of ductile iron, the second most widely used cast iron, is present in nodular or spheroidal form. The metallurgy required to produce ductile iron is more complex than for gray iron and requires close process control. Products are made of ductile iron when reduced brittleness and increased strength is required. Malleable iron has the majority of its graphite in irregularly shaped nodules and, unlike the other forms of cast iron, requires annealing by heating rapidly to 1,750°F and then cooling, to achieve the graphite configuration and the desired ductility, hardness, and other properties required in the cast product.

currently being made predominantly of plastics and processed paper. Ductile iron, a stronger and more expensive material than gray iron, can be poured into molds designed for gray iron to produce construction castings for certain applications where high performance is essential or desirable, such as construction castings used in airport runways. Ductile iron can also be poured into specially designed molds to produce thin-walled construction castings that use less metal to attain equivalent performance and therefore have less weight; all imports of manhole covers, rings, and frames from France are believed to be produced from ductile iron in this way. Ductile iron currently has a small share of the construction castings market in the United States; however, some industry sources expect that ductile iron will be used in increasing quantities in construction castings, primarily for weight reasons. 1/

There is a difference in the product definition for the construction castings included within the scope of this investigation and those subject to several recent title VII investigations. All manhole covers, rings, and frames, all catch basin grates and frames, and all cleanout covers and frames, if made of iron and classified in the applicable tariff items, are included in this investigation regardless of the amount of special machining that has been accomplished. The title VII investigations limited the scope of their product coverage to standard items and excluded "specials," such as lock-down and water-tight manhole covers.

Pipe fittings.—Iron pressure pipe fittings for water mains are used to join pipes, to change the direction or diameter of pipe, or to provide access for cleaning. These fittings are used in water distribution systems that deliver water from the water authorities to homes, commercial buildings, and other facilities. Standard dimensions of cast fittings for water mains range from 3 to 48 inches. Fittings are cast in various shapes such as tees, 90-degree elbows, bends, variations of Y's, crosses, and other shapes.

Water main fittings are made principally from gray and ductile iron. Standards are established by the American Water Works Association (AWWA) and approved by the American National Standards Institute, Inc. (ANSI) for ductile-iron compact fittings (3 to 12 inches) and for ductile-iron and gray-iron fittings (3 to 48 inches). Some manufacturers make fittings with dimensions that range from 2 to 54 inches as standard production items. Fittings larger than 54 inches can be produced as "specials" by a few foundries. Such nonstandard fittings as laterals, eccentric reducers, and reducing-on-the-run tees, can be cast according to manufacturers' standards.

Although gray iron was until recently the metal most often used for water main fittings, ductile iron is increasing in popularity. It is estimated that ductile iron now accounts for approximately 50 percent of U.S. production of pipe fittings, based on the number of fittings produced, and about 30 percent based on the tonnage produced. 2/ Industry sources 3/ indicate that the

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1/ Counsel for the French producer of construction castings points out that fewer people are required to lift and position the lighter weight products during installation, thereby reducing the risks of injury and lessening the possibility of personal liability claims by the installers against the municipalities or utilities.

2/ Discussions with Mr. R. Schofield, General Manager, Union Foundry, Anniston, AL.

3/ Discussions with Mr. Charles Roche, president, NAPPCO, and Mr. Joseph T. Donahue, v.p. of marketing, U.S. Pipe & Foundry Co.

increased popularity of ductile fittings is due to their lighter weight and higher tensile strength. The major advantages of ductile fittings are that they are able to withstand greater pressures than gray-iron fittings (340 versus 250 pounds per square inch, respectively), and can be cast in shorter lengths and with thinner walls. Gray- and ductile-iron water main fittings are interchangeable.

Municipal water systems constitute the primary market (over 80 percent) for gray- and ductile-iron water main fittings. Sewer systems and industrial uses, which consist primarily of water main fittings in fire protection systems, account for the remaining usage.

<u>Compressor housings</u>.—Compressors with cast-iron housings are used mainly for cooling- and heating-type applications (e.g., supermarket and restaurant refrigerators, freezers, commercial air-conditioning units, heat pumps, and residential heating and air-conditioning systems) and for compressing air (for such applications as paint spraying, tire inflation, and pneumatic tools of all sizes).

The cast-iron housing (also referred to as "body," "frame," or "crankcase") of a compressor contains, holds, supports, or anchors the compressor's operating parts (e.g., gears, bearings, pistons, and shaft). Some compressors, commonly known as hermetically sealed compressors, have a pressed steel exterior housing that surrounds the assembled compressor, including the cast-iron (internal) housing. Only cast-iron housings are subject to this investigation.

A cast-iron compressor housing may be a single casting or may have been cast in several pieces. The weight of compressor housings ranges from approximately 10 to 200 pounds for refrigeration and air-conditioning compressors in the 1/4- to 125-horsepower range, and up to many thousands of pounds for large air and gas compressors that are rated up to approximately 4,000 horsepower. In nearly all situations, cast-iron compressor housings are made of gray iron.

Most changes in compressors over the years have involved the internal moving parts; there has been little modification in the design of the housings, except for technical changes to meet modifications in energy efficiency requirements. There are few apparent physical differences between domestically produced and imported cast-iron compressor housings since these components are generally made to manufacturers' specifications. However, there are significant differences in the configuration of the housings depending on the type of compressor.

<u>Brake drums and rotors</u>.—Motor-vehicle brake systems, regardless of design, require a rotating and a nonrotating unit. As the stationary braking surface meets the rotating surface, friction develops and creates the controlled force necessary to slow the moving surface. The nonrotating unit incorporates brake pads; the rotating unit contains either brake drums or brake rotors, also called discs.

In systems using brake drums, the drum is secured to the motor-vehicle wheel. The brake pads contact the drum through either contraction of externally located brake pads against the outside of the drum or expansion of internally located pads against the inside of the drum. Most drum systems presently in use are the internal expansion type because they are more compact, lighter, and more economical than the external contraction type. Cast-iron brake drums provide excellent strength, heat dissipation, and friction characteristics. Cast-iron, however, weighs considerably more than pressed steel. Therefore, a steel drum will frequently use a cast-iron liner, either externally or internally, to permit a lighter total unit with sufficient strength and friction generation. The majority of these units, whether all iron or a steel and iron combination, are used in heavy-duty vehicles (construction and mining equipment and class 2-8 trucks).

In a disc brake system, the friction force develops when two brake pads mounted on nonrotating calipers contact the rotating surface of a cast-iron rotor. This rotor is secured behind the wheel hub so that the hub and rotor rotate about the axle spindle or steering knuckle simultaneously. The rotor (or disc) system is increasingly dominant in passenger cars because it is lighter in weight than the drum system; certain recent car models use steel-backed rotors to further decrease weight. Though some mid-class trucks use front disc brakes, disc systems generally are not powerful enough for heavy-duty vehicles. Electronic and computerized disc systems have been developed that eliminate wheel "lockup."

Manufacturing processes

Construction castings.—Foundries produce construction castings by pouring molten iron into molds, allowing the iron to cool and solidify, and removing ("shaking out") the iron products from the mold for finishing. The molten iron is produced from pig or scrap iron, 1/ coke, and limestone in cupola furnaces, but can also be made in electric furnaces. 2/ The green-sand casting method, previously discussed in the introductory section of this report, is used to produce heavy construction castings and, in some foundries, light castings. After cleaning and removal of the overflows, the casting is dip painted or sold as is.

The shell-mold process is used by some producers to make light construction castings. Others produce light castings in permanent molds; these molds are made of a metal with a higher melting point than that of the cast gray iron and, instead of being discarded after each pour, are used for several thousand pours. However, initial tooling costs are high and therefore the process is economical only for high-volume, standardized production.

Pipe fittings.—Pipe fittings are cast using sand-cast methods. The fittings are then cleaned, inspected, gauged for dimensional accuracy, weighed, drilled and/or machined, lined, and coated as required.

Although there is some use of ductile iron in the production of construction castings, pipe fittings are the only subject product made of

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1/ The basic raw material used by U.S. and Canadian producers is scrap iron, whereas, the Brazilian, Chinese, and Indian producers generally use pig iron.

2/ Some producers of iron construction castings, as well as foundries producing other products, have changed from melting iron in cupola furnaces to melting in various types of electric furnaces, largely to comply with Federal, State, and local pollution standards. Generally, larger foundries prefer cupola furnaces for melting, as they are more efficient when large quantities of iron need to be melted, whereas, smaller foundries often find electric furnaces to be more appropriate to their limited needs.

ductile iron in substantial quantities. Ductile iron requires the production of low sulfur base iron with adequate carbon, silicon, and other materials in a cupola furnace. Then, the base iron is subjected to pure magnesium in a controlled atmosphere, which converts the carbon in the iron from graphite flakes to nodular graphite. Raw materials used in the production of ductile iron have to be of a higher quality than those used in the production of gray iron because high amounts of chrome, phosphorus, copper, and manganese cannot be tolerated in ductile iron.

Compressor housings.—The majority of U.S. foundries use the sand-cast method to produce cast-iron compressor housings. In nearly all cases U.S. foundries do not perform any finishing operations on the cast-iron compressor housings, except for removal of gates, sprues, and risers and cleaning the casting. Instead, U.S. foundries ship the rough castings 1/ to the compressor manufacturers that perform finishing operations, such as drilling bolt holes and machining surfaces.

During the last decade, manufacturers of compressor housings have increasingly turned to new technologies, including automated molding machines, microprocessors that ensure quality and production standards, and robotics that replace manual handling of unfinished castings.

Brake drums and rotors.—In the production of brake drums and rotors, foundries make the cope and drag segments of the mold using the green-sand method, and the core is produced using one of several variations of sand casting. One method that illustrates the fundamental technique is known as the hot box process. Here, sand combined with a resin containing ammonium chloride is introduced into a preheated box die to form the core shape. The temperature of the box causes the ammonium chloride to break down, releasing a hydrochloric acid vapor that immediately hardens the resin-treated sand. Another common variation uses sulfur dioxide-treated sand injected with hydrogen peroxide.

Electric holding furnaces are used that permit constant spectrographic analysis of the metal. Automated equipment, using a computer-aided process, matches the amount of metal poured to the mold requirements, thereby reducing the amount of overflow. The cast brake drums and rotors are cleaned and trimmed to remove overflows and then sold rough. These castings do not generally require a great deal of advanced machining. The purchaser, frequently a brake manufacturer, usually will perform any advancement.

U.S. tariff treatment

Construction castings.—Imports of the iron construction castings subject to this investigation are classified in TSUS items 657.09, 657.10, and 657.25. For statistical reporting purposes, imports under item 657.09 are further broken out into the following TSUSA items: (a) manhole covers, rings, and frames (TSUSA item 657.0950), and (b) other castings (TSUSA item

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1/ In the remainder of this report, the term "rough castings" refers to castings that are not advanced beyond cleaning and not machined beyond the removal of fins, gates, sprues, and risers or beyond what is necessary to permit location in finishing machinery; "advanced castings" refers to castings that have been advanced or machined beyond the rough castings.

657.0990). The column 1 rates of duty 1/ for TSUS items 657.09, 657.10, and 657.25 are free, 3.2 percent ad valorem, and 6.2 percent ad valorem, respectively. The column 2 rates are 10 percent, 20 percent, and 45 percent ad valorem. Imports from least developed developing countries (LDDC's) under TSUS items 657.10 and 657.25 are afforded rates of 3.1 percent ad valorem and 5.7 percent ad valorem, respectively; imports from Israel and those countries eligible for the Generalized System of Preferences (GSP) or CBERA benefits enter free of duty. 2/ Table I-1 shows the column 1 and column 2 rates of duty, including the staged reductions of the column 1 rates resulting from the Tokyo Round of the Multilateral Trade Negotiations.

Pipe fittings.—Imported cast-iron and ductile-iron fittings are classified under TSUS items 610.62, 610.63, 610.70, 610.71, 610.74, and 610.82. The column 1 rates for these items range from 5.6 to 7.4 percent ad valorem, and the column 2 rates range from 20 to 45 percent. Imports under TSUS items 610.63 and 610.71 are also subject to additional duties with respect to chromium, molybdenum, tungsten, and vanadium content, as provided in headnote 4, subpart B, part 2, schedule 6 of the Tariff Schedules. Imports of pipe fittings from Israel and those countries eligible for GSP and CBERA benefits enter duty free. However, imports under TSUS items 610.70 from Taiwan, 610.74 from the Republic of Korea and Taiwan, and 610.82 from the Republic of Korea are not eligible for GSP treatment. Where the column 1 rate of duty is being reduced, imports from LDDC's are afforded the final (1987) staged rate.

Compressor housings.—Compressor housings are classified in TSUSA item 661.1072, effective January 1, 1986; prior to that date, they were reported under the residual or "basket" TSUSA item 661.1090 (parts of compressors). The column 1 rate of duty is 3.5 percent ad valorem and the column 2 rate is 35 percent. Compressor housings from Israel and countries eligible for GSP and CBERA benefits enter free of duty.

Brake drums and rotors.—Brake drums and rotors are classified in TSUSA item 692.3262, effective January 1, 1986; prior to that date, brake drums and rotors were reported under TSUSA item 692.3272 (brakes and parts thereof for motor vehicles). A separate tariff item exists to grant duty-free entry to components from Canada imported as original motor-vehicle equipment. This provision, TSUS item 692.33 (more specifically, TSUSA item 692.3372), was established pursuant to the Automotive Products Trade Act of 1965 (APTA), implementing the U.S.-Canadian auto pact.

Brake parts imported under 692.32 are eligible for duty-free treatment if the product of Israel or countries eligible for GSP or CBERA. However, imports from Mexico, Brazil, and Taiwan currently exceed the competitive-need limits under the GSP program and therefore do not receive such duty-free treatment.

1/ The rates of duty in col. 1 are most-favored-nation (MFN) rates and are applicable to imported products from all countries except those Communist countries and areas enumerated in general headnote 3(d) of the TSUS (which receive the col. 2 rate of duty).

2/ Imports are eligible for duty-free entry under the GSP, if the products of designated beneficiary countries (enumerated in general headnote 3(e)(v) of the TSUS); duty-free entry is also granted to eligible articles both from Israel under the United States-Israel Free Trade Agreement and from designated CBERA beneficiary countries. Imports from Taiwan under TSUS item 657.25 are not eligible for GSP benefits.

Table I-1.--Certain iron castings: U.S. rates of duty, by TSUS items, 1986-87

TSUS item No.	Description 1/	Pre-MTN col 1. rate of duty 2/	Col. 1 rate of duty effective with respect to articles entered on or after Jan. 1--		Col 2 rate of duty
			1986	1987	
	Nonmalleable cast-iron fittings:				
	For cast-iron pipe:				
610.62	Nonalloy cast iron	10%	6.5%	5.8%	25%.
610.63	Alloy cast iron	12% + AD 3/	7.4% + AD 3/	6.5% + AD 3/	33% + AD. 3/
	Malleable cast-iron fittings:				
	Not advanced:				
610.70	Nonalloy cast iron	8%	5.6%	5.1%	20%.
610.71	Alloy cast iron	10% + AD 3/	6.5% + AD 3/	5.8% + AD 3/	28% + AD. 3/
610.74	Advanced	11%	7%	6.2%	45%.
610.82 4/	Ductile fittings	11%	7%	6.2%	45%.
	Nonalloyed cast-iron articles:				
657.09	Not malleable	Free	Free	Free	10%.
657.10	Malleable	4%	3.2%	3.1%	20%.
657.25	Certain alloy iron articles	9.5%	6.2%	5.7%	45%.
661.10 5/	Certain compressors; parts of compressors	4.5%	3.5%	3.4%	35%.
692.32	Certain motor-vehicle parts	4%	3.2%	3.1%	25%.

1/ Rate effective prior to Jan. 1, 1980; pursuant to negotiations in the Tokyo Round of the MTN, are staged reductions in the rates of duty effective Jan. 1 of each year during 1980-87.

2/ Tariff Schedules of the United States should be consulted for a more complete description of the additional duties and for further definitions.

3/ "AD" denotes additional duties are also applicable.

4/ As of Apr. 1, 1984, item 610.82 and several other items were established and item 610.80 was discontinued.

5/ As of Mar. 31, 1982, items 661.09 and 661.10 were established and item 661.12 was discontinued.

U.S. Producers

Over 80 foundries are believed to produce the subject iron castings in the United States. The petition in this investigation names 24 producers of construction castings, 7 producers of pipe fittings, 29 producers of compressor housings, and 22 producers of brake drums and rotors. Sixty-two producers provided usable data in response to the Commission's questionnaire. These 62 firms are believed to account for a very substantial share of total

U.S. production of subject iron castings. Of the 62 producers, 1/ 25 produce construction castings, 10 produce pipe fittings, 19 produce compressor housings, and 15 produce brake drums and rotors.

Construction castings

There were 31 producers of construction castings responding to the Commission's questionnaire, of which 25 firms provided usable data. Of the 25 firms providing usable data, 13 firms reported producing no other iron castings and the remaining 12 reported producing iron castings other than those covered by this investigation. Additionally, two of the firms reported producing pipe fittings, one reported producing compressor housings, and one reported producing brake drums and rotors. * * * account for the largest tonnage production of the 25 producers and together accounted for * * * percent of production of construction castings in 1985, as shown in the following tabulation (in percent of tonnage produced):

Producer	Share of production 1984	1985
Almo Iron Works	***	***
Alhambra Foundry Co., Ltd	***	***
Allegheny Foundry	***	***
American Brass & Iron Foundry	***	***
Campbell Foundry Co	***	***
Charlotte Pipe & Foundry Co	***	***
Draper Corp	***	***
Deeter Foundry, Inc	***	***
East Jordan Iron Works, Inc	***	***
Etheridge Foundry & Machine Co	***	***
John Bouchard & Sons Co	***	***
LeBaron Foundry, Inc	***	***
Leed Foundry, Inc	***	***
Mabry Foundry	***	***
McKinley Iron Works	***	***
Memphis Machine Works	***	***
Miles Foundry	***	***
Moritz Foundry	***	***
Municipal Castings, Inc	***	***
Neenah Foundry Co	***	***
Olympic Foundry	***	***
Pinkerton Foundry, Inc	***	***
Russell Pipe & Foundry Co., Inc	***	***
Tyler Pipe Industries	***	***
U.S. Foundry & Manufacturing Corp	***	***

See footnotes at end of tabulation.

1/ Four producers of construction castings also produce other subject products—two firms also produce pipe fittings, the third firm produces compressor housings, and the fourth firm also produces brake drums and rotors. Three firms produce both compressor housings and brake drums and rotors.

Producer	Share of production 1984	1985
VanRich Casting Corp	***	***
Vestal Manufacturing Co	***	***
Virginia Industries, Inc:		
Bingham & Taylor	***	***
Opelika Foundry Co	***	***
Vulcan Foundry	***	***
Western Foundry Co	***	***
Western Iron Works, Inc	***	***
Total	100.0	100.0

* * * * * * *

About * * * percent of the reported production of construction castings was from firms located in the North Central States of Michigan, Minnesota, and Wisconsin. Most other production was of foundries located in the Southern or Eastern States.

Pipe fittings

There are 12 firms known to be producing pipe fittings for water mains. These firms and their shares of 1984 and 1985 reported production are shown in the following tabulation (in percent of tonnage produced):

Producer	Share of production 1984	1985
American Cast Iron Pipe Co	***	***
Backman Foundry & Machine, Inc	***	***
Clow Water Systems Corp	***	***
Dayton Foundry Co	***	***
Griffin Pipe Products Co	***	***
Russell Pipe & Foundry Co., Inc	***	***
Texas Foundries, Inc	***	***
Trinity Valley Iron & Steel Co	***	***
Tyler Pipe Industries	***	***
Union Foundry Co	***	***
United States Pipe & Foundry Co	***	***
Western Foundry Co	***	***
Total	100.0	100.0

* * * * * * *

As shown, the three largest producers, * * *, accounted for nearly * * * of production in 1985 and the five largest producers accounted for * * * percent. The bulk of foundries producing pipe fittings are located in the Southern States of Alabama and Texas.

Compressor housings

There are 21 firms known to be producing compressor housings. These firms and their shares of 1984 and 1985 reported production are shown in the following tabulation (in percent of tonnage produced):

Producer	Share of production 1984	1985
Amcast	***	***
Benton Foundry, Inc	***	***
Bloomfield Foundry, Inc	***	***
Brillion Iron Works, Inc	***	***
Buckeye Foundry Co	***	***
Flynn & Emrich Co	***	***
General Casting Co	***	***
Hayes-Albion Corp	***	***
ITT Grinnell Corp	***	***
Ingersoll-Rand Co	***	***
Larson Consolidated, Inc	***	***
Lynchburg Foundry Co	***	***
Macaulay Foundry, Inc	***	***
Midwest Foundry	***	***
Neenah Foundry Co	***	***
Roberts Foundry	***	***
Sinking Spring Foundry	***	***
T&B Foundry Co	***	***
The Dalton Foundries, Inc	***	***
The G & C Foundry Co	***	***
Tioga Casting Facilities	***	***
Total	100.0	100.0

* * * * * * *

As shown, the two largest producers, * * *, accounted for over * * * of production in 1985 and the remaining producers accounted for less than * * * percent each.

Brake drums and rotors

There are 15 firms known to be producing the brake drums and rotors subject to this investigation. These firms and their shares of 1984 and 1985 reported production are shown in the following tabulation (in percent of tonnage produced):

Producer	Share of production 1984	Share of production 1985
Dayton Walther Corp	***	***
Durametal Corp	***	***
EMI Co	***	***
East Jordan Iron Works, Inc	***	***
General Motors Corp	***	***
Hayes-Albion Corp	***	***
ITT Grinnell Corp	***	***
Kelsey-Hayes Co	***	***
Motor Wheel Corp	***	***
Navistar International Corp	***	***
Reyco Industries, Inc	***	***
Sinking Spring Foundry	***	***
The Wheland Foundry	***	***
Wagner Div., Cooper Industries	***	***
Waupacca Foundry, Inc	***	***
Total	100.0	100.0

*   *   *   *   *   *   *

As shown, the four largest producers, * * *, accounted for nearly * * * of production in 1985. Two of these producers, * * *.

U.S. Importers

Importers' questionnaires were sent to nearly 150 firms identified either on the net import file of the U.S. Customs Service or by the petitioners. Ninety-four importers provided usable data in response to the Commission's questionnaire. Most of the remaining firms responded that they did not import the subject iron castings during 1981-85.

Construction castings

There are 52 known importers of construction castings; these importers and their shares of reported 1985 imports are shown in the following tabulation (in percent of imported tonnage):

*   *   *   *   *   *   *

As shown, the importation of construction castings is widely spread among many firms. The six largest, * * *, accounted for about * * * of 1985 imports.

Pipe fittings

There are 13 known importers of pipe fittings; these importers and their shares of reported 1985 imports are shown in the following tabulation (in percent of tonnage imported):

* * * * * * *

As shown, the four largest importing firms, * * *, accounted for over * * * of 1985 imports.

Compressor housings

There are eight known importers of compressor housings. Each of these importers is a compressor manufacturer that consumes the housings that it imports. The three largest importers, * * *, accounted for more than * * * of the imports of compressor housings in 1985. Importers of compressor housings and their shares of reported 1985 imports are shown in the following tabulation (in percent of tonnage imported):

* * * * * * *

Brake drums and rotors

There are 24 known importers of brake drums and rotors; these importers and their shares of reported 1985 imports are shown in the following tabulation (in percent of tonnage imported):

* * * * * * *

The largest three importing firms, * * *, accounted for * * * percent of imports in 1985 and the largest seven firms accounted for * * * percent.

The U.S. Market

Apparent U.S. consumption

Construction castings.—Apparent U.S. consumption of construction castings decreased from 179,034 tons 1/ in 1981 to 177,293 tons in 1982, or by 1 percent, increased at an average annual rate of 22 percent to 264,637 tons

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1/ Unless otherwise noted, the term "ton" refers to a short ton (2,000 pounds).

in 1984, and then increased by another 8 percent to 286,307 tons in 1985 (table I-2).

Pipe fittings.—Consumption of pipe fittings decreased from * * * tons in 1981 to 97,316 tons in 1982, or by * * * percent, increased at an average annual rate of 14 percent to 127,084 tons in 1984, and then increased slightly to 127,436 tons in 1985. 1/

Compressor housings.—Consumption of compressor housings decreased from 108,787 tons in 1981 to 75,542 tons in 1982, or by 31 percent, increased at an average annual rate of 24 percent to 116,537 tons in 1984, and then fell by 28 percent to 84,042 tons in 1985.

Brake drums and rotors.—Consumption of brake drums and rotors decreased from 506,706 tons in 1981 to 456,989 tons in 1982, or by 10 percent, increased at an average annual rate of 26 percent to 728,456 tons in 1984, and then decreased by 4 percent to 698,551 tons in 1985. Consumption of brake drums and rotors, the largest of any of the subject iron castings during 1981-85, accounted for 57 to 59 percent of the consumption of the subject iron castings in each year.

Factors affecting total demand for iron castings

Total U.S. demand for the subject iron castings is directly influenced by activity in the end-use sectors. 2/ For instance, demand for construction castings is heavily influenced by construction of highways and buildings, demand for pipe fittings is related to construction of water supply facilities and sewer systems, demand for compressor housings is related to the level of U.S.-produced compressors, and demand for brake drums and rotors, to the level of U.S. motor-vehicle production. In turn, activity in these end-use sectors is heavily influenced by changes in the general level of business activity as measured by real gross national product (GNP). Indexes of real U.S. GNP and activity in the various end-use markets are presented in table I-3 for the period of 1981-85. As shown in the table, activity fell in 1982 in all categories but rebounded strongly in 1983 and 1984 for most of the categories before increasing at a somewhat slower rate in 1985. 3/ Construction of water

1/ The switch from gray iron to ductile iron in the production of pipe fittings suggests that units might be a better indication of consumption than tonnage because ductile iron may be poured in compact molds resulting in thinner walled, lighter fittings, or may be poured in regular (gray-iron) molds. However, data on units produced and/or shipped were not requested in the Commission's questionnaire. Because of this shift to the lighter ductile-iron fittings during 1981-85, which is evident from questionnaire responses, consumption measured in units, if available, would show an even greater percentage increase during 1981-85.

2/ Other factors affecting demand for iron castings include downsizing of certain products (such as pipe fittings and brake drums), resulting in less tonnage requirements, and increased imports of downstream products (such as brake assemblies and compressors or refrigerators and automobiles). These factors are discussed in the section entitled "Possible Causes of Injury Other Than Imports."

3/ The U.S. economy experienced a serious recession from July 1981 through November 1982. Despite the recession in the last half of 1981, moderate growth in January-June resulted in about a 2-percent increase in real GNP in that year. But real output fell in 1982 for most sectors of the economy.

Table I-2.—Certain iron castings: Apparent U.S. consumption, 1981-85

(In short tons)

Item	1981	1982	1983	1984	1985
Construction castings	179,034	177,293	212,436	264,637	286,307
Pipe fittings	***	97,316	111,247	127,084	127,436
Compressor housings	108,787	75,542	90,292	116,537	84,042
Brake drums and rotors	506,706	456,989	577,292	728,456	698,551

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table I-3.—Index of real U.S. GNP and indexes of activity in the end-use sectors for the subject iron casting products, by years, 1981-85

Year	Real U.S. GNP 1/	Construction of highways and buildings 2/	Construction of water and sewer systems 2/	Domestic production of compressors 3/	Domestic production of motor vehicles 4/
1981	100.0	100.0	100.0	100.0	100.0
1982	97.5	97.7	88.9	92.0	87.9
1983	100.9	116.1	77.8	94.5	115.2
1984	107.5	132.3	90.5	5/ 98.1	134.6
1985	109.9	139.9	96.8	5/ 103.0	141.4

1/ Based on real GNP measured in 1982 dollars.

2/ Based on the real value of new construction put in place, measured in 1977 dollars.

3/ Based on the real value of U.S. producers' shipments of domestically produced compressors, including exports, measured in 1981 dollars. Current dollar values were deflated by the U.S. Producer Price Index with 1981 as the base year.

4/ Based on the number of units of U.S. producers' shipments of domestically produced motor vehicles, including exports.

5/ Estimates of the Commission staff with assistance from private sector analysts including trade associations and individual compressor manufacturers.

Source: Compiled from data reported by the U.S. Department of Commerce, the Air Conditioning and Refrigeration Institute, and the Motor Vehicle Manufacturers Association of the United States.

Note: 1981=100.

and sewer systems and domestic production of compressors, however, rebounded more slowly from the 1982 downturns.

Channels of distribution

Construction castings.—According to information obtained in the Commission study on the competitiveness of the U.S. Foundry Industry (henceforth referred to as the ITC foundry study) 1/ the marketing of iron construction castings in the United States differs from that of most other foundry products. First, iron construction castings are consumed in nearly the same condition and dimensions in which they have been cast with a minimum of machining or finishing. Second, the vast bulk of construction castings are ultimately purchased and used by utilities, municipalities, and other such entities for civil construction purposes. Hence, iron construction castings have limited channels of distribution and end markets.

The ITC foundry study found that 35 percent of U.S. producers' shipments of iron construction castings went to distributors and 65 percent went to nonspecified markets (e.g., contractors, firms that construct municipal water and other utility systems, municipalities, and so forth) or original-equipment manufacturers, whereas, 60 percent of importers' shipments went to distributors. The higher proportion of sales to distributors by importers is typical of metalworking industries' markets.

U.S. foundries, by virtue of their proximity to the municipalities and construction supply distributors, require relatively short leadtimes and can fill most orders for less popular construction castings or customized models without maintaining inventories of such items. Importers, with the longer leadtimes that they require, generally handle only the faster moving, more standardized models because of the resulting inventory carrying costs necessary to supply a complete range of products. Thus, although U.S. producers may typically handle 4,000 to 5,000 items, importers may carry only 150 to 200.

Pipe fittings.—U.S. producers that manufacture pipe fittings but do not also make pipes principally sell the fittings through an estimated 250 to 300 waterworks distributors that specialize in underground utility work. Sales of pipe fittings by producers that also make pipes are principally made directly to municipal and private utilities and through contractors working on water and sewer projects. The largest distributors have numerous distribution facilities or branches and usually stock and sell only products related to water works. Most producers ship to customers located throughout the United States. For example, one of the largest manufacturers of pipe fittings sells to distributors in 40 States.

Compressor housings.—Approximately 90 to 95 percent of compressor housings produced by U.S. foundries are sold directly to firms that assemble compressors, and the remainder of sales are typically made to distributors for resale in the market for replacement and service parts (called the aftermarket). The majority of imports of compressor housings is likewise sold directly to compressor manufacturers.

1/ Competitive Assessment of the U.S. Foundry Industry (Investigation No. 332-176), USITC Publication 1582, p. III-15.

U.S. foundries have certain distinct advantages over foreign competition in marketing their products to compressor manufacturers. Normally these producers are within relatively close proximity of their major industrial consumers, allowing for greater ease in production schedules, lower transportation costs, and prompt delivery.

Brake drums and rotors.—Motor-vehicle parts, including brake components, are used in two primary markets: the market for parts to be used in the production of motor vehicles, called the original-equipment (OE) market, and the aftermarket. According to both foundry and automaker sources, over 95 percent of the brake casting needs in the OE market are met by North American sources. Several of these foundry operations are subsidiaries of the automakers themselves. Distribution is either directly from the foundry to the automakers' machine shops or through an independent machining center to the auto companies.

The majority of brake drum and rotor imports, with the exception of imports entered from Canada under the APTA, are destined for the aftermarket. Distribution in the aftermarket for motor-vehicle parts typically consists of a manufacturer or importer selling to a warehouse distributor (WD), or group of WD's known as program distributors, that in turn sells to various parts jobbers. The jobbers, which number some 35,000 in the United States, sell primarily to the independent service channels (e.g., service stations, repair shops, and independent car dealers) and to retail customers. The aftermarket also includes the service bays of car dealers; however, these dealers receive most parts through their affiliated automakers' distribution networks.

The Question of Increased Imports

U.S. imports

U.S. imports of the subject iron castings during 1981-85 are presented in table I-4; imports by the rough and advanced categories, as well as units of imports for compressor housings and brake drums and rotors, are presented in appendix D, table D-1; 1985 imports by sources are presented in tables D-2 through D-5. Import trends for each of the product categories are discussed below.

Construction castings.—Total reported U.S. imports of iron construction castings increased by nearly threefold, from 20,682 tons in 1981 to 77,763 tons in 1985. The value of total imports of construction castings increased from $8.7 million in 1981 to $37.4 million in 1985. The bulk of these imports consisted of advanced castings during 1981-82 and rough castings during 1983-85. Data on U.S. imports of rough and advanced construction castings, by import source, in 1985 are presented in table D-2. The principal source was India, which accounted for 51 percent of the import tonnage; Canada accounted for 20 percent of 1985 imports, and Brazil and China accounted for 11 percent each.

Pipe fittings.—Total reported U.S. imports of cast-iron pipe fittings irregularly increased from * * * tons in 1981 to 10,594 tons in 1985. The value of total imports of castings of pipe fittings increased throughout the period from $*** in 1981 to $10.9 million in 1985. Ductile-iron castings accounted for * * * of the imports in 1981, about * * * percent in 1982 and

Table I-4.--Certain iron castings: U.S. imports for consumption, by types, 1981-85

Item	1981	1982	1983	1984	1985
	Quantity (tons)				
Construction castings	20,682	24,867	41,837	66,899	77,763
Pipe fittings:					
Ductile	***	***	***	3,372	5,884
Other	***	***	***	2,983	4,710
Total	***	4,148	4,136	6,355	10,594
Compressor housings	1,876	978	720	1,761	2,168
Brake drums and rotors	26,866	31,285	49,876	61,208	91,137
	Value (1,000 dollars)				
Construction castings	8,740	10,320	17,902	34,330	37,438
Pipe fittings:					
Ductile	***	***	***	4,699	6,486
Other	***	***	***	2,911	4,381
Total	***	3,764	4,190	7,610	10,867
Compressor housings	***	1,304	1,052	1,516	2,080
Brake drums and rotors	25,697	27,783	44,423	58,188	80,854
	Unit value (per ton)				
Construction castings	$423	$415	$428	$513	$481
Pipe fittings:					
Ductile	***	***	***	1,394	1,102
Other	***	***	***	976	930
Average	***	907	1,013	1,197	1,026
Compressor housings	***	1,333	1,461	861	959
Brake drums and rotors	956	888	891	951	887

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

1983, 53 percent of the imports in 1984, and 56 percent in 1985. The Republic of Korea was the principal source, accounting for 71 percent of the quantity of U.S. imports of cast-iron pipe fittings in 1985 (table D-3).

Compressor housings.--Total reported U.S. imports of cast-iron compressor housings decreased by 62 percent, from 1,876 tons in 1981 to 720 tons in 1983 and then exhibited a twofold increase to 2,168 tons in 1985. Except for 1981, rough castings made up the bulk of imports of compressor housings throughout the period. The value of total imports of compressor housings ranged from $1.1 million in 1983 to $*** in 1981, the year when the bulk of compressor housings were imported in the advanced state. Brazil was the principal source of U.S. imports of compressor housings in 1985, accounting for * * * percent of the tonnage, followed by the United Kingdom with * * * percent (table D-4).

Brake drums and rotors.—Total reported U.S. imports of brake drums and rotors increased by more than twofold, from 26,866 tons in 1981 to 91,137 tons in 1985. The value of total imports of brake drums and rotors increased steadily from $25.7 million in 1981 to $80.9 million in 1985. The bulk of imports in 1981, 1982, and 1985 consisted of rough castings. Although advanced castings were reported as being imported from several countries in 1985, rough brake drums and rotors were only reported as being imported from Canada. Canada and Mexico were the largest sources of U.S. imports of brake drums and rotors in 1985, accounting for 75 percent and 20 percent, respectively, of the tonnage (table D-5).

Ratio of imports to production

The ratios of reported U.S. imports to reported U.S. production of the subject iron castings are shown in table I-5. A discussion of the ratios for each of the subject products appears below.

Table I-5.—Certain iron castings: Ratios of imports to reported U.S. production, by types, 1981-85

(In percent)

Item	1981	1982	1983	1984	1985
Construction castings	12.7	16.5	24.5	33.3	36.6
Pipe fittings:					
Ductile	***	***	***	11.0	13.3
Other	***	***	***	3.1	6.0
Average	***	4.3	3.8	5.0	8.6
Compressor housings	1.7	1.3	.8	1.5	2.6
Brake drums and rotors	5.5	7.3	9.2	9.0	14.7

Source: Data presented in tables I-3 and I-5 of this report.

Construction castings.—U.S. imports of construction castings were equivalent to 12.7 percent of U.S. production of construction castings in 1981; the imports-to-production ratio increased during 1981-85 to reach 36.6 percent in 1985.

Pipe fittings.—The imports-to-production ratio for pipe fittings increased irregularly from * * * percent in 1981 to 8.6 percent in 1985. Except for 1981, the ratio of imports to production for ductile fittings considerably exceeded the ratio for nonductile fittings.

Compressor housings.—Imports of compressor housings decreased from 1.7 percent of U.S. production of compressor housings in 1981 to 0.8 percent in 1983 and then increased to 2.6 percent of production in 1985. This was the lowest imports-to-production ratio of any of the subject iron castings in each year of the period.

Brake drums and rotors.—Imports of brake drums and rotors were equivalent to 5.5 percent of production of such products in 1981; the imports-to-production ratio increased to reach 14.7 percent in 1985. The units of brake drums and rotors imported and produced and the ratio of such imports to production are presented in the following tabulation:

	1981	1982	1983	1984	1985
Imports—1,000 units—	2,471	2,985	4,578	5,701	8,356
Production———do———	35,801	32,585	38,362	47,131	45,234
Import to production ratio————percent—	6.9	9.2	11.9	12.1	18.5

The Question of Serious Injury

In order to gather data on the question of serious injury to U.S. producers of the subject iron castings, questionnaires were sent to the 70 represented producers listed in the petition, the 7 unrepresented producers listed in the petition, and to 65 other companies that may produce the subject castings. The data appearing in this section of the report are aggregated data of the 62 producers that provided usable data in response to the Commission's questionnaire. 1/

U.S. production, capacity, and capacity utilization

Production data presented in this section consist of data reported by U.S. producers on production of the subject iron products and of other iron castings produced by those firms. Producers were also asked to report the average annual practical capacity of their U.S. establishments to produce iron castings. 2/ The data obtained on U.S. production, 3/ capacity, and capacity utilization of iron castings are shown in table I-6.

1/ Most of the remaining firms responded that they did not cast the subject products during 1981-85.

2/ Practical capacity was defined as the greatest level of output a plant can achieve within the framework of a realistic work pattern. Producers were asked to consider, among other factors, a normal product mix and an expansion of operations that could be reasonably attained in their industry and locality in setting capacity in terms of the number of shifts and hours of plant operation.

3/ Production data were obtained for rough and advanced castings and are presented in app. E, table E-1. Production data based on weight alone may be misleading because of the downsizing of certain products, e.g., brake drums and rotors (which are of less weight on the smaller automobiles and trucks) and pipe fittings (which are of less weight when made of ductile iron in compact ductile-iron molds). Data on units of production were collected in the Commission's questionnaire for compressor housings and brake drums and rotors and are also presented in table E-1. There are no data available on units of construction castings or pipe fittings produced.

Table I-6.--Iron castings: U.S. production, capacity, and capacity utilization, by types, 1981-85

Item	1981	1982	1983	1984	1985
	Production (short tons) 1/				
By producers of construction castings:					
Construction castings 2/	162,313	150,375	171,002	200,977	212,571
Other iron castings 2/	307,053	248,898	260,415	302,740	291,625
Total	469,366	399,273	431,417	503,717	504,196
By producers of pipe fittings:					
Pipe fittings:					
Ductile 3/	10,702	16,452	17,918	30,561	44,124
Other	92,511	81,107	90,974	95,576	78,556
Total	103,213	97,559	108,892	126,137	122,680
Other iron castings 4/	422,287	391,007	405,327	448,048	440,907
Total 4/	525,500	488,566	514,219	574,185	563,587
By producers of compressor housings:					
Compressor housings	107,447	73,505	89,593	116,141	81,979
Other iron castings	542,285	386,863	503,099	610,944	559,833
Total	649,732	460,368	592,692	727,085	641,812
By producers of brake drums and rotors:					
Brake drums and rotors	487,773	428,559	539,477	679,912	618,496
Other iron castings	1,451,734	1,278,699	1,513,884	1,777,867	1,766,514
Total	1,939,507	1,707,258	2,053,361	2,457,779	2,385,010
	Capacity (short tons)				
Of producers of construction castings:					
Construction castings	368,375	373,325	384,746	399,469	455,184
Other iron castings	411,197	409,037	407,796	408,563	422,438
Total	779,572	782,362	792,542	808,032	877,622
Of producers of pipe fittings:					
Pipe fittings	169,587	188,228	191,056	191,412	195,773
Other iron castings 5/	488,462	488,233	487,911	487,628	488,963
Total 5/	658,049	676,461	678,967	679,040	684,736
Of producers of compressor housings:					
Compressor housings 6/	***	***	***	***	***
Other iron castings 6/	***	***	***	***	***
Total 6/	1,145,210	1,178,210	1,107,560	1,008,960	1,024,760
Of producers of brake drums and rotors:					
Brake drums and rotors	966,945	979,055	994,929	980,461	970,631
Other iron castings	1,883,874	1,841,912	1,869,167	2,758,263	2,533,894
Total	2,850,819	2,820,967	2,864,096	3,738,724	3,504,525

See footnotes at end of table.

Table I-6.--Iron castings: U.S. production, capacity, and capacity utilization, by types, 1981-85--Continued

Item	1981	1982	1983	1984	1985
	Capacity utilization (percent)				
By producers of construction castings:					
Construction castings	44.4	40.3	44.4	50.3	46.7
Other iron castings	74.7	60.8	63.9	74.1	69.0
Average	60.2	51.0	54.4	62.3	57.5
By producers of pipe fittings:					
Pipe fittings	60.9	51.8	57.0	65.9	62.7
Other iron castings	86.5	80.1	83.1	91.9	90.2
Average	79.9	72.2	75.7	84.6	82.3
By producers of compressor housings:					
Compressor housings 7/	55.3	37.2	47.2	60.4	42.9
Other iron castings 7/	54.2	38.2	52.1	67.7	61.7
Average	56.7	39.1	53.5	72.1	60.0
By producers of brake drums and rotors:					
Brake drums and rotors	50.4	43.8	54.2	69.3	63.7
Other iron castings	77.1	69.4	81.0	64.4	69.7
Average	68.0	60.5	71.7	65.7	68.1

1/ Information on rough and advanced production of subject products as well as available data on units of production are presented in table E-1 in app. E.

2/ * * *; therefore, reported data for construction castings are understated and reported data for other iron castings are overstated.

3/ Although ductile iron may be used to make compact fittings, considerable production of ductile-iron pipe fittings are cast in noncompact gray-iron molds. During 1981-83, virtually no ductile iron was cast in compact molds and less than one half of the tonnage of ductile-iron pipe fittings produced during 1984-85 was cast in compact molds.

4/ Gray and ductile pipe constitute the bulk of the production of and capacity for products other than pipe fittings. * * *, which shipped * * * tons of pipe in 1985, was unable to provide data on production and capacity for pipe at the facilities producing pipe fittings; therefore, data presented are understated.

5/ The bulk of the production of products other than pipe fittings was of gray and ductile pipe that was centrifugally cast on equipment unsuitable for the production of pipe fittings.

6/ * * * producers of compressor housings, which accounted for * * * tons per year of compressor housing production during 1981-85 and * * * tons of other iron castings, elected to not allocate capacity to the production of specific products inasmuch as the same equipment is used to produce all of their products. The total reported capacity of these producers was * * * tons during 1981-83, * * * tons in 1984, and * * * tons in 1985.

7/ Computed from data of firms providing both production and capacity data.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Note.--Because of rounding, figures may not add to the totals shown.

<u>Construction castings</u>.—U.S. production of construction castings decreased from 162,313 tons in 1981 to 150,375 tons in 1982, or by 7 percent, and then increased to 212,571 tons in 1985, or at an average annual rate of 12 percent. Rough castings accounted for the bulk of the total production of construction castings throughout the period. Capacity to produce construction castings increased at an average annual rate of 3 percent from 368,375 tons in 1981 to 399,469 tons in 1984 and then rose by 14 percent to 455,184 tons in 1985. Capacity utilization ranged from 40.3 percent in 1982 to 50.3 percent in 1984.

Construction castings accounted for 35 percent of the production of all iron castings by firms producing construction castings in 1981, 38 percent in 1982, 40 percent in 1983 and 1984, and 42 percent in 1985. Reported capacity to produce construction castings as a share of capacity to produce all iron castings similarly increased from 47 percent in 1981 to 52 percent in 1985. Generally, the same equipment that is used to make the construction castings is also used by the producers to make other castings. However, capacity utilization for construction castings was significantly less in each year than capacity utilization for all iron castings for these firms.

<u>Pipe fittings</u>.—U.S. production of castings of the subject pipe fittings decreased from 103,213 tons in 1981 to 97,559 tons in 1982, or by 5 percent, increased to 126,137 tons in 1984, or at an average annual rate of 14 percent, and then decreased by 3 percent to 122,680 tons in 1985. Except for a dip in 1983, ductile increased its share of the total production of pipe fittings from 10 percent in 1981 to 35 percent in 1985. The bulk of reported production was of advanced castings throughout the period, accounting for * * * to * * * percent of the total. Capacity to produce cast-iron pipe fittings increased from 169,587 tons in 1981 to 191,056 tons in 1983, increased only slightly in 1984, and then rose to 195,773 tons in 1985. Capacity utilization decreased from 60.9 percent in 1981 to 51.8 percent in 1982, increased to 65.9 percent in 1984, and decreased to 62.7 percent in 1985.

Pipe fittings accounted for about one-fifth of the production of all iron castings by firms producing pipe fittings during 1981-85. Reported capacity to produce pipe fittings as a share of capacity to produce all iron castings increased from 25 percent in 1981 to 29 percent in 1985. The capacity utilization for pipe fittings was significantly less in each year than the capacity utilization for all iron castings for these firms. Most of the other iron castings produced by producers of pipe fittings consist of water and soil pipe that is centrifugally cast on molding equipment unsuitable for use in the production of pipe fittings, and the pipe fittings are cast using molding equipment unsuitable for the production of pipe. A few producers produce other products on the same equipment as the pipe fittings, for example, cast-iron valve parts; however, these other castings are insignificant compared with both the pipe and pipe fittings production tonnages.

<u>Compressor housings</u>.—U.S. production of compressor housings decreased from 107,447 tons in 1981 to 73,505 tons in 1982, or by 32 percent, increased to 116,141 tons in 1984, and then decreased by 29 percent to 81,979 tons in 1985. Annual capacity to produce compressor housings increased from * * * tons in 1981 to * * * tons in 1985. Capacity utilization of castings of compressor housings decreased from 55.3 percent in 1981 to 37.2 percent in 1982, increased to 60.4 percent in 1984, and decreased to 42.9 percent in 1985.

Compressor housings irregularly decreased as a share of the production of all iron castings by firms producing compressor housings from 17 percent in 1981 to 13 percent in 1985. Reported capacity to produce compressor housings as a share of capacity to produce all iron castings ranged from 15 percent in 1982 to 19 percent in 1985. Although some equipment may be used exclusively for compressor housing production when there are enough orders, generally, the same equipment that is used to make the compressor housings is also used by the producers to make other castings. However, the capacity utilization of compressor housings, which approximated the capacity utilization of all iron castings by these firms in 1981, exhibited an increasing divergence until, in 1985 capacity utilization for compressor housings was 17 percentage points lower than capacity utilization for all iron castings for these firms.

Brake drums and rotors.—U.S. production of castings of brake drums and rotors decreased from 487,773 tons in 1981 to 428,559 tons in 1982, or by 12 percent, increased to 679,912 tons in 1984, or at an average annual rate of 26 percent, and then decreased by 9 percent to 618,496 tons in 1985. Over 92 percent of the units of rough brake drum and rotor castings produced during 1981-85 were for the OE market, as was over 89 percent of the production of advanced brake drum and rotor units. Annual capacity to produce brake drums and rotors increased from 966,945 tons in 1981 to 994,929 tons in 1983 and decreased to 970,631 tons in 1985. Capacity utilization of brake drums and rotors decreased from 50.4 percent in 1981 to 43.8 percent in 1982, increased to 69.3 percent in 1984, and decreased to 63.7 percent in 1985.

Production of brake drums and rotors accounted for 25 to 28 percent of the production of all iron castings by firms producing brake drums and rotors during 1981-85. Reported capacity to produce brake drums and rotors as a share of capacity to produce all iron castings was 34 to 35 percent during 1981-83 and dropped to 26 to 28 percent in 1984-85. Generally, the same equipment that is used to make the brake drums and rotors is also used by the producers to make other castings; however, if there are sufficient orders, particular molding lines may be dedicated for long periods of time exclusively to the production of brake drums and rotors. Although the capacity utilization for brake drums and rotors was substantially less than the capacity utilization for those firms to produce all iron castings during 1981-83, in 1984, capacity utilization for brake drums and rotors exceeded that for all iron castings, and in 1985 lagged by only 4 percentage points.

U.S. producers' shipments

Construction castings.—U.S. producers' shipments of construction castings decreased from 158,352 tons in 1981 to 152,426 tons in 1982, or by 4 percent, then increased at an annual rate of 14 percent to 197,738 tons in 1984; shipments continued to rise by 5 percent in 1985 (table I-7). Construction castings was the only subject iron casting to experience an increase in producers' shipments in 1985.

Pipe fittings.—U.S. producers' shipments of pipe fittings decreased from 99,736 tons in 1981 to 93,168 tons in 1982, or by 7 percent, increased at an annual rate of 14 percent to 120,729 tons in 1984, and then fell by 3 percent to 116,842 tons in 1985.

Table I-7.--Certain iron castings: U.S. producers' shipments, 1/ by types, 1981-85

Item	1981	1982	1983	1984	1985
	Quantity (tons)				
Construction castings:					
Intra- and inter-company transfers	***	***	***	***	***
Domestic shipments	***	***	***	***	***
Total	158,352	152,426	170,599	197,738	208,544
Pipe fittings:					
Intra- and inter-company transfers	***	***	***	11,376	12,335
Domestic shipments	***	***	***	109,353	104,507
Total	99,736	93,168	107,111	120,729	116,842
Compressor housings:					
Intra- and inter-company transfers	***	***	***	***	***
Domestic shipments	***	***	***	***	***
Total	106,911	74,564	89,572	114,776	81,874
Brake drums and rotors:					
Intra- and inter-company transfers	213,220	174,711	209,821	279,420	252,632
Domestic shipments	266,620	250,993	317,595	387,828	354,782
Total	479,840	425,704	527,416	667,248	607,414
	Value (1,000 dollars)				
Construction castings:					
Intra- and inter-company transfers	***	***	***	***	***
Domestic shipments	***	***	***	***	***
Total	103,785	101,015	113,253	133,441	143,525
Pipe fittings:					
Intra- and inter-company transfers	***	***	***	11,519	14,642
Domestic shipments	***	***	***	142,052	153,890
Total	124,255	113,467	131,259	153,571	168,532
Compressor housings:					
Intra- and inter-company transfers	***	***	***	***	***
Domestic shipments	***	***	***	***	***
Total	88,954	61,882	67,603	90,040	69,131
Brake drums and rotors:					
Intra- and inter-company transfers	142,469	124,202	143,205	215,085	188,740
Domestic shipments	178,097	167,555	203,435	254,722	242,911
Total	320,566	291,757	346,640	469,807	431,651

1/ Includes shipments within the United States (i.e., intra- and intercompany transfers and domestic shipments); export shipments are presented in table I-8.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Compressor housings.—U.S. producers' shipments of compressor housings decreased from 106,911 tons in 1981 to 74,564 tons in 1982, or by 30 percent, increased at an annual rate of 24 percent to 114,776 tons in 1984, and then fell by 29 percent to 81,874 tons in 1985. Proportionately, compressor housings experienced greater fluctuations in the quantity of shipments than any of the other subject iron products during 1981-85.

Brake drums and rotors.—U.S. producers' shipments of brake drums and rotors decreased from 479,840 tons in 1981 to 425,704 tons in 1982, or by 11 percent, increased at an annual rate of 25 percent to 667,248 tons in 1984, and then decreased by 9 percent to 607,414 tons in 1985. Shipments of brake drums and rotors, the largest of any of the subject iron castings during 1981-85, accounted for 57 to 61 percent of the shipments of the subject iron castings in each year. Brake drums and rotors are the only subject casting with large intra- and intercompany transfers, ranging from 40 to 44 percent of producers' shipments during 1981-85.

U.S. producers' exports

U.S. exports reported by U.S. producers of the subject iron castings were small compared with the combined total of domestic shipments and intra- and intercompany transfers (producers' shipments). Exports of construction castings and compressor housings by producers, as a ratio to producers' shipments, were * * * percent during 1981-85 (table I-8). Exports by U.S. producers of pipe fittings increased from 2,405 tons, or 2.4 percent of producers' shipments, in 1981 to 3,579 tons, or 3.8 percent of producers' shipments, in 1982 and then decreased to 990 tons, or 0.8 percent of producers' shipments, in 1985. The largest exports of the subject products by producers during 1981-85 were of brake drums and rotors; such exports decreased from 4,975 tons, or 1.0 percent of producers shipments in 1981 to 3,824 tons, or 0.9 percent of producers' shipments in 1982 and then increased to 8,370 tons, or 1.4 percent of producers' shipments in 1985.

Table I-8.—Certain iron castings: U.S. producers' exports of domestic merchandise, by types, 1981-85

Item	1981	1982	1983	1984	1985
	Quantity (tons)				
Construction castings	***	***	***	***	***
Pipe fittings	2,405	3,579	2,768	2,124	990
Compressor housings	***	***	***	***	***
Brake drums and rotors	4,975	3,824	4,970	7,056	8,370
	Value (1,000 dollars)				
Construction castings	***	***	***	***	***
Pipe fittings	3,958	9,388	5,700	5,748	2,325
Compressor housings	***	***	***	***	***
Brake drums and rotors	12,244	6,439	8,299	10,514	11,862

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

U.S. producers' inventories

U.S. producers' yearend inventories of their own production of iron castings are presented in table I-9. The ratios of these inventories to producers' shipments, including domestic shipments and intra- and intercompany transfers, are also presented.

Table I-9.—Certain iron castings: U.S. producers' yearend inventories, by types, 1981-85

Item	1981	1982	1983	1984	1985
	Quantity (tons)				
Construction castings	39,011	36,113	35,736	40,580	43,274
Pipe fittings	38,747	37,685	35,524	36,667	39,535
Compressor housings	***	2,084	2,310	***	***
Brake drums and rotors	28,582	24,656	31,757	37,223	43,668
	Share of producers' shipments 1/ (percent)				
Construction castings	24.6	23.7	20.9	20.5	20.8
Pipe fittings	38.8	40.4	33.2	30.4	33.8
Compressor housings	***	2.8	2.6	***	***
Brake drums and rotors	6.0	5.8	6.0	5.6	7.2

1/ Includes intra- and intercompany transfers and domestic shipments.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Construction castings.—Producers' inventories of construction castings decreased from 39,011 tons in 1981 to 35,736 tons in 1983 and then increased to 43,274 tons in 1985. The ratio of producers' inventories to shipments ranged from 20.5 to 24.6 percent during 1981-85.

Pipe fittings.—Producers' inventories of pipe fittings decreased from 38,747 tons in 1981 to 35,524 tons in 1983 and then increased to 39,535 tons in 1985. The ratio of producers' inventories to shipments ranged from 30.4 to 40.4 percent during 1981-85.

Compressor housings.—Producers' inventories of compressor housings decreased from * * * tons in 1981 to 2,084 tons in 1982, increased to * * * tons in 1984, and then decreased to * * * tons in 1985. The ratio of producers' inventories to shipments ranged from 2.6 to * * * percent during 1981-85.

Brake drums and rotors.—Producers' inventories of brake drums and rotors decreased from 28,582 tons in 1981 to 24,656 tons in 1982 and then increased to 43,668 tons in 1985. The ratio of producers' inventories to shipments ranged from 5.6 to 7.2 percent during 1981-85.

U.S. employment and productivity

Data collected on employment, hours worked, wages paid, total compensation paid, average hourly wages, and productivity are presented below for each of the subject products. In some cases the producing firms were unable to estimate the number of production and related workers and the related hours, wages, and total compensation on a product basis since the same workers produce several products, not just the subject products. For this reason, in addition to employment information for the subject product, the accompanying tables also contain employment information relative to the production of all iron castings by reporting producers.

Construction castings.—The average number of production and related workers producing construction castings was 1,625 in 1981, decreased by 10 percent in 1982, and then increased at an annual rate of 6 percent to 1,722 workers in 1985 (table I-10). Hours worked by these workers likewise decreased by 10 percent in 1982 and then increased by 7 percent in 1983, 10 percent in 1984, and 11 percent in 1985. Wages and total compensation paid to production and related workers followed the same general trend. Hourly wages paid to production and related workers increased from $7.10 in 1981 to $8.31 in 1984 and then fell to $8.06 in 1985. The output per 1,000 hours worked increased by 3 percent in 1982, 6 percent in 1983, and 7 percent in 1984; in 1985, such output declined by 5 percent.

Pipe fittings.—The average number of production and related workers producing pipe fittings was 1,698 in 1981, decreased by 7 percent in 1982, increased by 4 percent in 1983 and by 1 percent in 1984, and then decreased by 8 percent to a period low of 1,505 workers in 1985 (table I-11). Hours worked by these workers decreased by 8 percent in 1982, increased by 8 percent in 1983 and 5 percent in 1984, and then decreased by 2 percent in 1985. Wages and total compensation paid to production and related workers decreased by 3 percent in 1982 and then increased by 36 percent to their 1985 levels. Hourly wages paid to production and related workers increased throughout the period from $6.27 in 1981 to $8.83 in 1985. The output per 1,000 hours worked increased by 28 percent between 1981 and 1984 and then dropped by 1 percent in 1985.

Compressor housings.—The average number of production and related workers producing compressor housings was 1,040 in 1981, fell to 643 in 1983, increased to 797 in 1984, and then decreased to 650 workers in 1985 (table I-12). Hours worked by these workers and both wages and total compensation paid them followed the same general trend as employment, falling between 1981 and 1983, increasing in 1984, and decreasing again in 1985. Hourly wages paid to production and related workers increased throughout the period from $8.20 in 1981 to $9.42 in 1985. The output per 1,000 hours worked decreased by 4 percent between 1981 and 1982, jumped by 28 percent in 1983, and then dropped by 5 percent from 1983 to 1985.

Brake drums and rotors.—The average number of production and related workers producing brake drums and rotors was 2,604 in 1981, fell to 2,318 in 1982, increased to 2,622 in 1984, and then decreased to 2,612 workers in 1985 (table I-13). Hours worked by these workers and both wages and total compensation paid them followed the same general trend as employment, falling between 1981 and 1982, increasing in 1983 and 1984, and decreasing again in 1985. Hourly wages paid to production and related workers increased

Table I-10.--Average number of production and related workers employed in establishments 1/ of firms that produced construction castings, hours worked by, wages paid to, and total compensation of such workers, average hourly wages paid, and productivity, 1981-85 2/

Product	1981	1982	1983	1984	1985
Production and related workers producing--					
Construction castings	1,625	1,465	1,530	1,680	1,722
All iron castings	5,085	4,579	4,474	4,822	4,744
Hours worked by production and related workers producing--					
Construction castings 1,000 hours	3,120	2,815	3,014	3,312	3,678
All iron castings do	9,758	7,851	8,192	9,264	9,703
Wages paid to production and related workers producing--					
Construction castings 1,000 dollars	22,163	21,042	23,616	27,512	29,649
All iron castings do	77,817	70,495	74,357	86,161	90,779
Total compensation paid to production and related workers producing--					
Construction castings 1,000 dollars	26,533	25,428	28,414	33,538	36,254
All iron castings do	98,222	90,146	94,798	105,939	114,917
Average hourly wages of production and related workers producing--					
Construction castings	$7.10	$7.47	$7.84	$8.31	$8.06
All iron castings	$7.97	$8.98	$9.08	$9.30	$9.36
Output per 1,000 hours worked by production and related workers producing-- 3/					
Construction castings-tons	51.4	52.9	56.2	60.1	57.2
All iron castings do	46.5	49.1	51.0	52.8	50.4

1/ The questionnaire defined establishments as the facilities of a firm wherein all iron castings (not just subject products of investigation No. 201-TA-58) are produced. Some firms have reported on a more narrow scope, limiting the establishment to those facilities wherein subject products are produced.

2/ Data presented for construction castings are for 22 producers that together accounted for * * * percent of construction castings production and * * * percent of all iron castings production in 1985. Data presented for all iron castings are for 23 producers that together accounted for * * * percent of construction castings production and * * * percent of all iron castings production in 1985.

3/ Based only on firms that reported both production data and data on hours worked.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table I-11.—Average number of production and related workers employed in establishments 1/ of firms that produced pipe fittings, hours worked by, wages paid to, and total compensation of such workers, average hourly wages paid, and productivity, 1981-85 2/

Product	1981	1982	1983	1984	1985
Production and related workers producing—					
Pipe fittings	1,698	1,574	1,631	1,644	1,505
All iron castings	5,286	5,135	5,139	5,277	5,112
Hours worked by production and related workers producing—					
Pipe fittings—1,000 hours	3,269	2,734	2,966	3,113	3,064
All iron castings—do	9,992	8,836	9,396	10,091	9,986
Wages paid to production and related workers producing—					
Pipe fittings 1,000 dollars	20,501	19,908	22,996	25,367	27,069
All iron castings—do	77,336	80,087	88,295	97,549	98,953
Total compensation paid to production and related workers producing—					
Pipe fittings 1,000 dollars	25,322	24,544	27,796	31,063	33,275
All iron castings—do	100,766	104,255	113,121	121,606	127,773
Average hourly wages of production and related workers producing—					
Pipe fittings	$6.27	$7.28	$7.75	$8.15	$8.83
All iron castings	$7.74	$9.06	$9.40	$9.67	$9.91
Output per 1,000 hours worked by production and related workers producing— 3/					
Pipe fittings—tons	31.6	35.7	36.7	40.5	40.0
All iron castings—do	52.5	55.1	54.6	56.8	56.3

1/ The questionnaire defined establishments as the facilities of a firm wherein all iron castings (not just subject products of investigation No. 201-TA-58) are produced. Some firms have reported on a more narrow scope, limiting the establishment to those facilities wherein subject products are produced.

2/ Data presented for pipe fittings are for nine producers that together accounted for * * * percent of both pipe fittings production and all iron castings production in 1985.

3/ Based only on firms that reported both production data and data on hours worked.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table I-12.—Average number of production and related workers employed in establishments 1/ of firms that produced compressor housings, hours worked by, wages paid to, and total compensation of such workers, average hourly wages paid, and productivity, 1981-85 2/

Product	1981	1982	1983	1984	1985
Production and related workers producing—					
Compressor housings	1,040	818	643	797	650
All iron castings	8,821	6,541	6,258	7,050	6,213
Hours worked by production and related workers producing—					
Compressor housings 1,000 hours	1,882	1,306	1,208	1,507	1,128
All iron castings do	16,036	11,143	11,820	13,819	11,822
Wages paid to production and related workers producing—					
Compressor housings 1,000 dollars	15,436	11,107	10,882	13,616	10,627
All iron castings do	142,992	105,811	125,391	147,443	129,905
Total compensation paid to production and related workers producing—					
Compressor housings 1,000 dollars	20,126	15,173	14,869	16,231	15,377
All iron castings do	174,737	136,052	154,371	178,247	158,171
Average hourly wages of production and related workers producing—					
Compressor housings	$8.20	$8.50	$9.01	$9.04	$9.42
All iron castings	$8.92	$9.50	$10.61	$10.67	$10.99
Output per 1,000 hours worked by production and related workers producing— 3/					
Compressor housings tons	42.8	41.3	50.7	50.3	48.2
All iron castings do	40.4	41.2	50.1	52.5	54.2

1/ The questionnaire defined establishments as the facilities of a firm wherein all iron castings (not just subject products of investigation No. 201-TA-58) are produced. Some firms have reported on a more narrow scope, limiting the establishment to those facilities wherein subject products are produced.

2/ Data presented for compressor housings are for 12 producers that together accounted for * * * percent of compressor housings production and * * * percent of all iron castings production in 1985. Data presented for all iron castings are for 17 producers that together accounted for * * * percent of both compressor housings production and all iron castings production in 1985.

3/ Based only on firms that reported both production data and data on hours worked.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table I-13.—Average number of production and related workers employed in establishments 1/ of firms that produced brake drums and rotors, hours worked by, wages paid to, and total compensation of such workers, average hourly wages paid, and productivity, 1981-85 2/

Product	1981	1982	1983	1984	1985
Production and related workers producing—					
Brake drums and rotors	2,604	2,318	2,426	2,622	2,612
All iron castings	4,963	4,225	4,258	4,915	4,822
Hours worked by production and related workers producing—					
Brake drums and rotors 1,000 hours	4,754	4,433	4,780	5,521	5,296
All iron castings do	9,251	8,028	8,377	10,568	9,919
Wages paid to production and related workers producing—					
Brake drums and rotors 1,000 dollars	42,806	40,179	47,179	57,727	55,863
All iron castings do	86,889	75,959	87,430	116,751	113,204
Total compensation paid to production and related workers producing—					
Brake drums and rotors 1,000 dollars	55,543	52,498	61,388	74,885	74,583
All iron castings do	112,983	101,622	111,141	145,050	142,916
Average hourly wages of production and related workers producing—					
Brake drums and rotors	$9.00	$9.06	$9.87	$10.46	$10.55
All iron castings	$9.39	$9.46	$10.44	$11.05	$11.41
Output per 1,000 hours worked by production and related workers producing— 3/					
Brake drums and rotors tons	79.0	76.0	94.1	97.5	95.1
All iron castings do	62.7	61.8	78.8	79.4	78.5

1/ The questionnaire defined establishments as the facilities of a firm wherein all iron castings (not just subject products of investigation No. 201-TA-58) are produced. Some firms have reported on a more narrow scope, limiting the establishment to those facilities wherein subject products are produced.

2/ Data presented for brake drums and rotors are for 14 producers that together accounted for * * * percent of brake drums and rotors production and * * * percent of all iron castings production in 1985.

3/ Based only on firms that reported both production data and data on hours worked.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

throughout the period from $9.00 in 1981 to $10.55 in 1985. The output per 1,000 hours worked decreased by 4 percent in 1982, jumped by 24 percent in 1983, increased by an additional 4 percent in 1984, and then dropped by 2 percent in 1985.

Financial experience of U.S. producers

Most of the machinery and equipment in the responding foundries within which the subject products are produced is used in the production of more than one product. Producers generally do not maintain complete income-and-loss data on each product line. Depending on the cost accounting system employed, some costs are directly charged to a product line, whereas other costs are allocated through various means. The basis used for allocating the various costs and expenses to each product varied from producer to producer. There are no perfect or standard methods for allocating manufacturing overhead costs and other expenses, but each basis of allocation should have a logical and close relationship to actual production practices in order to apply appropriate or reasonable costs and expenses to each product. Generally, each company uses allocation methods that are based on each firm's objectives for cost control and other management needs, and that take into consideration the cost-benefit rule for the company as a whole.

There are fewer allocations of costs and expenses involved at the level of all iron castings operations than at the product line level. The same is true for divisional operations compared with all iron castings operations. However, there are still some allocations of corporate costs at the divisional level. Hence, the income-and-loss data on different levels of operations that are presented below for the responding firms are limited in their use as an absolute measure of profitability. However, if each producer was consistent from year to year in its bases for allocating costs (and there is no evidence to the contrary), the data presented in this section should reflect, with a reasonable degree of accuracy, profit trends at each level of operations.

Financial experience of U.S. producers of construction castings. 1/— Nineteen producers of construction castings, which together accounted for * * * percent of reported production of construction castings in 1984, provided the Commission with usable financial information. These data, which include income-and-loss information and selected indicators of the financial condition of the industry, are presented below. 2/

1/ Because of differences in product coverage, these data are not identical to data reported in the recent title VII investigations on iron construction castings. See discussion on p. I-2.

2/ Data for 13 firms are the same for construction castings and all iron castings operations because they make only one cast-iron product. Eleven of these 13 firms made no special allocations to derive the reported data; 1 firm allocated only its general, selling, and administrative (GS&A) expenses on the basis of sales, and another firm allocated some of its factory costs and GS&A expenses on the basis of estimated efforts expended on these product lines. Three of the remaining five firms made no special allocations to derive data on all iron castings operations; one firm made allocations for only GS&A expenses based on sales dollars. Three of the five firms used standard cost systems and, consequently allocated only variances on the basis of pounds produced, whereas two firms allocated all manufacturing costs on the basis of pounds produced. Most allocated their GS&A expenses on the basis of sales dollars.

<u>Construction castings</u>.—Eighteen U.S. producers of construction castings supplied usable income-and-loss data for 1981-84 and 17 producers supplied such data for the interim periods ended December 31, 1984, and December 31, 1985. Aggregate net sales of construction castings declined slightly from $101.3 million in 1981 to $100.4 million in 1982, or by 1 percent, and then increased by 31 percent to $131.5 million in 1984 (table I-14). During the interim periods ended December 31, sales grew from $109.3 million in 1984 to $116.0 million in 1985, or by 6 percent.

Aggregate operating income fell faster than sales during 1981-82, declining from $5.0 million, or 5.0 percent of sales, in 1981 to $4.2 million, or 4.2 percent of sales, in 1982. In 1983, operating income increased by 47 percent to $6.2 million, or 5.6 percent of sales, then rose again by 50 percent in 1984 to $9.3 million, or 7.1 percent of sales. During the interim periods ended December 31, operating income increased from $8.3 million in 1984 to $8.8 million in 1985, representing an increase of 7 percent. The interim period operating margins in 1984 and 1985 were both 7.6 percent. Pretax net income margins (ratio of net income before income taxes to net sales) followed a trend similar to the operating income margins, except for a slight decline in the interim period of 1985.

Cash flow from operations decreased from $9.6 million in 1981 to $9.0 million in 1982 and then increased to $13.6 million in 1984. Cash flow rose to $12.9 million in the interim period of 1985 compared with $11.6 million in the interim period of 1984. Operating losses were reported by 7 of the 18 producers in 1981; such losses were sustained by 5 firms in 1982, 4 firms in 1983, and 3 firms in 1984. During the interim periods ended December 31, operating losses were sustained by 3 of the 17 reporting firms in 1984 and by 5 of the 17 firms in 1985.

<u>All iron castings</u>.—Usable income-and-loss data were received from 19 U.S. producers of construction castings on their operations producing all iron castings for fiscal years 1981-84 and from 18 U.S. producers for the interim periods ended December 31, 1984, and December 31, 1985. Reported net sales of all iron castings by the responding U.S. producers fell from $301.4 million in 1981 to $262.9 million in 1982, or by 13 percent, and then increased by 33 percent to $348.7 million in 1984 (table I-15). During the interim periods ended December 31, sales increased slightly from $304.4 million in 1984 to $305.6 million in 1985, or by 0.4 percent.

Aggregate operating income declined by 47 percent from $26.4 million, or 8.8 percent of sales, in 1981 to $14.0 million, or 5.3 percent of sales, in 1982, and then rose to $36.7 million, or 10.5 percent of sales, in 1984. During the interim periods ended December 31, operating income dipped by 14 percent, from $34.7 million, or 11.4 percent of sales, in 1984 to $29.9 million, or 9.8 percent of net sales, in 1985. The pretax net income margin followed the same trend as the operating income margin.

Cash flow from operations declined from $37.0 million in 1981 to $23.4 million in 1982 and then rose to $29.9 million in 1983 and $45.4 million in 1984. Such cash flow dropped to $36.1 million during the interim period of 1985, compared with $41.3 million during the interim period of 1984.

Operating losses were sustained by 8 of the 19 reporting firms in 1981 and 1982; such losses were reported by 4 firms during 1983-84. In both of the interim periods, 4 of the 18 firms sustained operating losses.

Table I-14.--Income-and-loss experience of 18 U.S. producers 1/ on their operations producing construction castings, accounting years 1981-84 and interim periods ended Dec. 31, 1984, and Dec. 31, 1985

Item	1981	1982	1983	1984	Interim period ended Dec. 31-- 1984	Interim period ended Dec. 31-- 1985
Net sales:						
Trade------1,000 dollars--	***	***	***	***	***	***
Intra- and intercompany transfers--1,000 dollars--	***	***	***	***	***	***
Total----------do----	101,345	100,361	111,102	131,464	109,297	116,049
Cost of goods sold------do----	78,529	76,958	83,973	99,686	81,880	87,040
Gross profit---------do----	22,816	23,403	27,129	31,778	27,417	29,009
General, selling, and administrative expenses 1,000 dollars--	17,790	19,173	20,918	22,459	19,157	20,180
Operating income-------do----	5,026	4,230	6,211	9,319	8,260	8,829
Interest expense 2/----do----	381	428	469	582	505	445
Other income 2/-------do----	908	667	585	725	688	206
Net income before income taxes 2/----1,000 dollars--	5,553	4,469	6,327	9,462	8,443	8,590
Depreciation and amortization expense 3/ included above 1,000 dollars--	4,086	4,538	4,118	4,179	3,117	4,274
Cash flow from operations 4/ 1,000 dollars--	9,639	9,007	10,445	13,641	11,560	12,864
As a share of net sales:						
Cost of goods sold percent--	77.5	76.7	75.6	75.8	74.9	75.0
Gross profit---------do----	22.5	23.3	24.4	24.2	25.1	25.0
General, selling, and administrative expenses percent--	17.6	19.1	18.8	17.1	17.5	17.4
Operating income------do----	5.0	4.2	5.6	7.1	7.6	7.6
Net income 2/ before income taxes----------percent--	5.5	4.5	5.7	7.2	7.7	7.4
Number of firms reporting operating losses--------------	7	5	4	3	3	5
Number of firms reporting net losses----------------	7	7	5	4	4	5

1/ These firms accounted for * * * percent of reported U.S. production in 1984. There are 17 firms reporting for both interim periods.

2/ * * * firms, which accounted for * * * percent of reported 1984 net sales, did not provide the Commission with data on interest expenses and other income and expenses; hence, net income before taxes may be overstated or understated.

3/ * * * firms, which accounted for * * * percent of reported 1984 net sales, did not provide the Commission with data on depreciation and amortization.

4/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table I-15.—Income-and-loss experience of 19 U.S. producers of construction castings 1/ on their operations producing all iron castings, accounting years 1981-84 and interim periods ended Dec. 31, 1984, and Dec. 31, 1985

Item	1981	1982	1983	1984	Interim period ended Dec. 31— 1984	Interim period ended Dec. 31— 1985
Net sales:						
Trade—1,000 dollars	***	***	***	***	***	***
Intra- and intercompany transfers—1,000 dollars	***	***	***	***	***	***
Total—do	301,440	262,854	292,011	348,650	304,426	305,564
Cost of goods sold—do	238,959	210,816	231,105	268,761	232,671	235,107
Gross profit—do	62,481	52,038	60,906	79,889	71,755	70,457
General, selling, and administrative expenses 1,000 dollars	36,048	38,052	39,476	43,165	37,098	40,542
Operating income—do	26,433	13,986	21,430	36,724	34,657	29,915
Interest expense 2/—do	729	646	701	901	668	629
Other income 2/—do	4,254	3,020	2,514	2,884	2,536	874
Net income before income taxes 2/—1,000 dollars	29,958	16,360	23,243	38,707	36,525	30,160
Depreciation and amortization expense 3/ included above 1,000 dollars	7,087	7,068	6,685	6,681	4,808	5,954
Cash flow from operations 4/ 1,000 dollars	37,045	23,428	29,928	45,388	41,333	36,114
As a share of net sales:						
Cost of goods sold percent	79.3	80.2	79.1	77.1	76.4	76.9
Gross profit—do	20.7	19.8	20.9	22.9	23.6	23.1
General, selling, and administrative expenses percent	12.0	14.5	13.5	12.4	12.2	13.3
Operating income—do	8.8	5.3	7.3	10.5	11.4	9.8
Net income 2/ before income taxes—percent	9.9	6.2	8.0	11.1	12.0	9.9
Number of firms reporting operating losses	8	8	4	4	4	4
Number of firms reporting net losses	6	9	4	4	4	5

1/ These firms accounted for * * * percent of reported U.S. production of construction castings in 1984. There are 18 firms reporting for both interim periods.

2/ * * * firms, which accounted for * * * percent of reported 1984 net sales, did not provide the Commission with data on interest expenses and other income and expenses; hence, net income before taxes may be overstated or understated.

3/ * * * firms, which accounted for * * * percent of reported 1984 net sales, did not provide the Commission with data on depreciation and amortization.

4/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Total net sales of construction castings reported by 18 firms (see table I-14) ranged between * * * and * * * percent of total net sales of their all iron castings during 1981-85. The income-and-loss data on all iron castings operations of those 18 firms that supplied such data on their construction castings operations are summarized in the following tabulation:

* * * * * * *

Overall operations.--Seventeen U.S. producers of construction castings supplied financial data on their companies' overall or divisional operations for accounting years 1981-85. Net sales declined annually from $349.4 million in 1981 to $324.3 million in 1983, or by 7 percent, and then increased to $399.4 million in 1985 (table I-16). Aggregate operating income, which dropped faster than net sales, fell by 41 percent from $33.2 million in 1981 (9.5 percent of net sales) to $19.6 million in 1983 (6.1 percent of net sales); such income rose to $35.4 million (9.5 percent of net sales) in 1984 and then declined to $32.1 million (8.0 percent of net sales) in 1985. Aggregate pretax net income margins were higher than the operating income margins but followed a similar trend.

Financial condition of U.S. producers.--Key balance sheet information and selected financial ratios of the 17 U.S. producers of construction castings that provided income-and-loss data on their overall or divisional operations are presented in table I-17.

A comparison of current assets with current liabilities provides an indication of the ability of the company to pay its short-term debts. One such indicator is the ratio of current assets to current liabilities, commonly known as the current ratio. The current ratio for the reporting producers increased from 3.62 in 1981 to 3.92 in 1983 and then declined to 3.22 in 1984 and 2.81 in 1985. A current ratio of more than 2.0 is normally considered to be strong. Another primary indication of short-run solvency is working capital. Aggregate working capital increased from $74.9 million in 1981 to $86.5 million in 1984, or by 15 percent, and then dropped by 14 percent to $74.3 million in 1985. The net value of property, plant, and equipment declined from $74.2 million in 1981 to $70.4 million in 1983 and then increased to $90.4 million in 1985. Total assets increased by 17 percent during 1981-85.

The ratio of debt to equity indicates the relationship between capital provided by creditors and capital contributed by owners. A falling ratio indicates a decline in total liabilities relative to total equity. The ratio of debt to equity for the 17 firms declined by 28 percent during 1981-83 and then increased by 22 percent during 1983-85.

The return-on-investment ratios measure the effectiveness of management in employing the resources available to it. The return is measured by various types of investment as presented in the table. All of the different measures of return on investment showed a similar trend, declining from 1981 to 1983, rising in 1984 to about the levels of 1981, and then dropping again in 1985.

Table I-16.—Income-and-loss experience of 17 U.S. producers of construction castings 1/ on their companies' overall or divisional operations, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales——1,000 dollars—	349,394	340,057	324,308	373,806	399,403
Cost of goods sold——do——	274,529	267,461	256,692	286,508	311,574
Gross profit——do——	74,865	72,596	67,616	87,298	87,829
General, selling, and administrative expenses 1,000 dollars—	41,646	46,098	47,974	51,871	55,712
Operating income——do——	33,219	26,498	19,642	35,427	32,117
Interest income, net 2/-do——	1,534	2,627	1,996	1,690	2,195
Other income 2/——do——	440	1,103	725	652	122
Net income before income taxes 2/——1,000 dollars—	35,193	30,228	22,363	37,769	34,434
Depreciation and amortization expense included above 1,000 dollars—	13,876	15,045	14,471	13,982	14,115
Cash flow from operations 3/ 1,000 dollars—	49,069	45,273	36,834	51,751	48,549
As a share of net sales:					
Cost of goods sold percent—	78.6	78.7	79.2	76.6	78.0
Gross profit——do——	21.4	21.3	20.8	23.4	22.0
General, selling, and administrative expenses percent—	11.9	13.6	14.8	13.9	13.9
Operating income——do——	9.5	7.8	6.1	9.5	8.0
Net income before income taxes 2/——percent—	10.1	8.9	6.9	10.1	8.6
Number of firms reporting operating losses——	4	6	5	4	4
Number of firms reporting net losses——	4	6	4	4	4

1/ These firms accounted for * * * percent of reported U.S. production of construction castings in 1985.

2/ * * * firms, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on interest and other income and expenses; hence, net income before taxes may be overstated or understated.

3/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table I-17.--Selected balance sheet and financial ratios of 17 U.S. producers 1/ of construction castings on their overall or divisional operations, as of the end of accounting years 1981-85

Item	1981	1982	1983	1984	1985
Total current assets 1,000 dollars	103,511	115,056	114,604	125,474	115,263
Property, plant, and equipment, net----1,000 dollars	74,221	70,191	70,413	71,779	90,356
Total assets----do	218,182	225,760	223,145	237,690	255,907
Total current liabilities 1,000 dollars	28,598	30,548	29,206	39,007	41,006
Long-term debt due after 1 year----1,000 dollars	21,866	12,466	9,820	7,207	12,286
Total liabilities----do	52,926	45,522	41,637	48,756	55,833
Equity----do	165,256	180,238	181,508	188,933	200,073
Working capital----do	74,913	84,508	85,398	86,467	74,257
Current ratio----times	3.62	3.77	3.92	3.22	2.81
Total debt to equity----do	0.32	0.25	0.23	0.26	0.28
Return on investment ratios:					
Pretax income or (loss) to--					
Equity----percent	21.3	16.8	12.3	20.0	17.2
Total assets----do	16.1	13.4	10.0	15.9	13.5
Invested capital 1/ percent	23.6	19.5	14.4	23.9	20.9

1/ Invested capital is defined as working capital plus net property, plant, and equipment.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Investment in property, plant, and equipment.--Fifteen U.S. producers provided data concerning their investment in facilities employed in the production of construction castings, as presented in the following tabulation (in thousands of dollars):

Period	Original cost	Book value
1981	37,203	13,756
1982	38,609	13,271
1983	40,126	13,369
1984	53,673	25,237
Interim period ended Dec. 31-- 1/		
1984	42,020	16,037
1985	55,341	25,925

1/ Data are for 14 firms.

Aggregate investment in productive facilities, valued at cost, increased from $37.2 million in 1981 to $53.7 million in 1984 and $55.3 million in the interim period of 1985. The book value of such facilities generally followed the same trend as the original cost of investment.

Capital expenditures and research and development expenses.—Fourteen U.S. producers supplied data relative to their capital expenditures to comply with Government regulations and for building, machinery, and equipment used in the production of construction castings; and eight U.S. producers provided data relative to their research and development expenses, as shown in the following tabulation (in thousands of dollars):

Period	Capital expenditures 1/			Research and development expenses
	Government regulations	Operations	Total	
1981	***	***	1,957	475
1982	306	1,161	1,467	547
1983	230	2,301	2,531	677
1984	206	***	***	668
Interim period ended Dec. 31—1/				
1984	***	***	***	438
1985	***	***	6,998	487

1/ Data for both interim periods are for 13 firms.

Total capital expenditures declined from $2.0 million in 1981 to $1.5 million in 1982 and then rose to $*** in 1984. In 1984, * * * reported $*** of capital expenditures that includes * * *. Such expenditures rose to $7.0 million during the interim period of 1985 compared with $*** in the interim period of 1984. Capital expenditures to comply with Government regulations, such as the Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA) or other Government agencies, dropped from $*** in 1981 to $206,000 in 1984 but increased to $*** during the interim period of 1985, compared with $*** in the interim period of 1984. Research and development expenses increased from $475,000 in 1981 to $668,000 in 1984 and increased to $487,000 during the interim period of 1985 compared with $438,000 in the interim period ended December 31, 1984.

Financial experience of U.S. producers of pipe fittings.—Nine producers of pipe fittings, which together accounted for * * * percent of reported production of pipe fittings in 1985, provided the Commission with usable financial information as presented below. 1/

1/ Six of the nine reporting producers made no special allocations to derive the reported data on their all iron castings operations; the remaining three firms allocated only GS&A expenses on the basis of sales dollars. Three of these nine firms' data are the same for pipe fittings and all iron castings because two of them make only one cast-iron product. One of six firms reporting data on pipe fittings operations made no special allocations to derive the data. Three of the remaining five firms allocated only GS&A expenses on the basis of sales dollars; two firms allocated their manufacturing costs on the basis of pounds produced.

Pipe fittings.—Six U.S. producers of pipe fittings supplied usable income-and-loss data for 1981-85. Aggregate net sales of pipe fittings declined from $122.4 million in 1981 to $118.0 million in 1982, or by 4 percent, and then increased annually to $162.2 million in 1985, or by 37 percent (table I-18).

Aggregate operating income dropped by nearly 50 percent from $11.3 million, or 9.2 percent of sales, in 1981 to $5.8 million, or 4.9 percent of sales, in 1982. In 1983, an operating loss of $749,000, or 0.6 percent of sales, was incurred. However, the firms reported aggregate operating incomes that increased from $8.1 million, or 5.4 percent of sales, in 1984 to $10.8 million, or 6.6 percent of sales in 1985. Pretax net income margins followed a trend similar to the operating income margins.

Cash flow from operations decreased from $13.2 million in 1981 to $1.5 million in 1983 and then increased to $13.4 million in 1985. Operating losses were reported by two of the six producers in 1981 and 1982, three firms in 1983 and 1984, and two firms in 1985.

All iron castings.—Usable income-and-loss data were received from nine U.S. producers of pipe fittings on their operations producing all iron castings for fiscal years 1981-85. Reported net sales of all iron castings by the responding U.S. producers fell from $286.5 million in 1981 to $280.8 million in 1982, or by 2 percent, and then increased by 21 percent to $339.2 million in 1985 (table I-19).

Aggregate operating income declined by 47 percent from $28.7 million, or 10.0 percent of sales, in 1981 to $15.1 million, or 5.2 percent of sales, in 1983, and then rose to $30.4 million, or 9.1 percent of sales, in 1984, before declining slightly to $30.2 million, or 8.9 percent of net sales, in 1985. The pretax net income margin followed the same trend as the operating income margin.

Cash flow from operations declined from $32.7 million in 1981 to $19.4 million in 1983 and then rose to $35.8 million in 1984 before decreasing slightly to $35.6 million in 1985. Operating losses were sustained by two of the nine reporting firms in 1981 and 1982 and by three firms during 1983-85.

Total net sales of pipe fittings reported by six firms (see table I-18) ranged between 44 and 50 percent of total net sales of their all iron castings during 1981-85. The income-and-loss data on all iron castings operations of those six firms that supplied such data on their pipe fittings operations are summarized in the following tabulation:

Item	1981	1982	1983	1984	1985
Net sales——1,000 dollars——	271,183	266,682	276,332	317,394	324,999
Operating income or (loss) 1,000 dollars——	27,993	22,833	15,439	30,446	30,726
Operating income margin percent——	10.3	8.6	5.6	9.6	9.5
Ratio of pipe fittings net sales to all iron castings net sales——percent——	45.1	44.2	45.5	47.3	49.9

Table I-18.--Income-and-loss experience of 6 U.S. producers 1/ on their operations producing pipe fittings, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales:					
Trade------1,000 dollars--	***	***	***	138,678	147,666
Intra- and intercompany transfers---1,000 dollars---	***	***	***	11,386	14,523
Total---do---	122,439	117,980	125,704	150,064	162,189
Cost of goods sold---do---	98,256	98,214	111,877	127,016	135,117
Gross profit---do---	24,183	19,766	13,827	23,048	27,072
General, selling, and administrative expenses 1,000 dollars--	12,878	13,981	14,576	14,969	16,315
Operating income or (loss) 1,000 dollars--	11,305	5,785	(749)	8,079	10,757
Interest expense 2/---do---	467	426	440	8	15
Other income or (expense) 2/ 1,000 dollars--	(43)	(75)	(57)	143	(145)
Net income or (loss) before income taxes 2/ 1,000 dollars--	10,795	5,284	(1,246)	8,214	10,597
Depreciation and amortization expense included above 3/ 1,000 dollars--	2,441	2,979	2,747	2,722	2,814
Cash flow from operations 4/ 1,000 dollars--	13,236	8,263	1,501	10,936	13,411
As a share of net sales:					
Cost of goods sold percent--	80.2	83.2	89.0	84.6	83.3
Gross profit---do---	19.8	16.8	11.0	15.4	16.7
General, selling, and administrative expenses percent--	10.5	11.9	11.6	10.0	10.1
Operating income or (loss) percent--	9.2	4.9	(.6)	5.4	6.6
Net income or (loss) before income taxes 2/--percent--	8.8	4.5	(1.0)	5.5	6.5
Number of firms reporting operating losses---	2	2	3	3	2
Number of firms reporting net losses---	3	2	3	3	2

1/ These firms accounted for * * * percent of reported U.S. production in 1985.

2/ * * * firm, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on interest expenses and other income and expenses; hence, net income or loss before taxes may be overstated or understated.

3/ * * * firm, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on depreciation and amortization.

4/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table I-19.—Income-and-loss experience of 9 U.S. producers of pipe fittings 1/ on their operations producing all iron castings, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales:					
Trade——1,000 dollars—	***	***	***	313,278	***
Intra- and intercompany transfers—1,000 dollars—	***	***	***	19,685	***
Total——do——	286,514	280,772	289,328	332,963	339,193
Cost of goods sold——do——	230,558	228,060	243,970	270,685	274,687
Gross profit——do——	55,956	52,712	45,358	62,278	64,506
General, selling, and administrative expenses 1,000 dollars—	27,290	29,737	30,231	31,842	34,305
Operating income——do——	28,666	22,975	15,127	30,436	30,201
Interest expense or (income), net 2/——1,000 dollars—	190	268	381	(79)	(106)
Other income or (expense) 2/ 1,000 dollars—	(9)	(51)	(223)	189	(3)
Net income before income taxes 2/——1,000 dollars—	28,467	22,656	14,523	30,704	30,304
Depreciation and amortization expense included above 3/ 1,000 dollars—	4,207	5,103	4,900	5,130	5,322
Cash flow from operations 4/ 1,000 dollars—	32,674	27,759	19,423	35,834	35,626
As a share of net sales:					
Cost of goods sold percent—	80.5	81.2	84.3	81.3	81.0
Gross profit——do——	19.5	18.8	15.7	18.7	19.0
General, selling, and administrative expenses percent—	9.5	10.6	10.4	9.6	10.1
Operating income——do——	10.0	8.2	5.2	9.1	8.9
Net income before income taxes 2/——percent—	9.9	8.1	5.0	9.2	8.9
Number of firms reporting operating losses——	2	2	3	3	3
Number of firms reporting net losses——	2	2	3	3	3

1/ These firms accounted for * * * percent of reported U.S. production of pipe fitting in 1985.

2/ * * * firms, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on interest expenses and other income and expenses; hence, net income before taxes may be overstated or understated.

3/ * * * firm, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on depreciation and amortization.

4/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Overall operations.—Nine U.S. producers of pipe fittings supplied financial data on their companies' overall or divisional operations for accounting years 1981-85. Net sales declined annually from $1.0 billion in 1981 to $885.9 million in 1983, or by 13 percent, and then increased to $1.1 billion in 1985 (table I-20). Aggregate operating income, which dropped faster than net sales, fell by 37 percent, from $107.5 million in 1981 (10.5 percent of net sales) to $67.5 million in 1983 (7.6 percent of net sales); such income rose to $119.2 million (11.5 percent of net sales) in 1984 and to $128.8 million (11.9 percent of net sales) in 1985. The majority of the large "other expense" item reflects the charges of * * *. Aggregate pretax net income margins followed a trend similar to that of the operating income margins.

Financial condition of U.S. producers.—Key balance sheet information and selected financial ratios of the nine U.S. producers of pipe fittings that provided income-and-loss data on their overall or divisional operations are presented in table I-21.

The current ratio for the reporting producers increased from 3.24 in 1981 to 5.10 in 1985, or by 57 percent. A current ratio of more than 2.0 is normally considered to be strong. Aggregate working capital increased from $236.3 million in 1981 to $317.1 million in 1985, or by 34 percent. The net value of property, plant, and equipment rose from $200.3 million in 1981 to $226.1 million in 1985. Total assets increased by 15 percent during 1981-85. The ratio of debt to equity for the nine firms declined by 38 percent during 1981-85. All of the different measures of return on investment showed a similar trend, declining from 1981 to 1983, rising in 1984 to about the levels of 1981, and then remaining nearly steady in 1985.

Investment in property, plant, and equipment.—Five U.S. producers provided data concerning their investment in facilities employed in the production of pipe fittings, as presented in the following tabulation (in thousands of dollars):

Year	Original cost	Book value
1981	42,727	23,277
1982	48,113	24,896
1983	45,734	24,148
1984	46,744	22,612
1985	49,969	24,370

Aggregate investment in productive facilities, valued at cost, increased from $42.7 million in 1981 to $48.1 million in 1982, declined during 1982-84, and then rose to $50.0 million in 1985. The book value of such facilities generally followed the same trend as the original cost of investment.

Capital expenditures and research and development expenses.—Seven U.S. producers supplied data relative to their capital expenditures to comply with Government regulations and for building, machinery, and equipment used in the production of pipe fittings, and three U.S. producers provided data

Table I-20.--Income-and-loss experience of 9 U.S. producers of pipe fittings 1/ on their companies' overall or divisional operations, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales------1,000 dollars---	1,019,888	918,964	885,871	1,033,614	1,082,157
Cost of goods sold------do------	827,551	737,147	730,130	822,304	854,808
Gross profit----------do------	192,337	181,817	155,741	211,310	227,349
General, selling, and administrative expenses 1,000 dollars---	84,826	87,744	88,205	92,151	98,509
Operating income--------do------	107,511	94,073	67,536	119,159	128,840
Interest expense or (income), net----------1,000 dollars---	(741)	(1,417)	288	9	(463)
Other (expense) 1,000 dollars---	(12,201)	(10,158)	(9,219)	(10,663)	(14,842)
Net income before income taxes--------1,000 dollars---	96,051	85,332	58,029	108,487	114,461
Depreciation and amortization expense included above 1,000 dollars---	27,195	28,916	29,433	29,548	30,577
Cash flow from operations 2/ 1,000 dollars---	123,246	114,248	87,462	138,035	145,038
As a share of net sales:					
Cost of goods sold percent---	81.1	80.2	82.4	79.6	79.0
Gross profit----------do------	18.9	19.8	17.6	20.4	21.0
General, selling, and administrative expenses percent---	8.3	9.5	10.0	8.9	9.1
Operating income-------do------	10.5	10.2	7.6	11.5	11.9
Net income before income taxes----------percent---	9.4	9.3	6.6	10.5	10.6
Number of firms reporting operating losses-------------	1	1	2	1	2
Number of firms reporting net losses------------------	1	1	2	1	2

1/ These firms accounted for * * * percent of reported U.S. production of pipe fitting in 1985.

2/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table I-21.—Selected balance sheet and financial ratios of 9 U.S. producers 1/ of pipe fittings on their overall or divisional operations, as of the end of accounting years 1981-85

Item	1981	1982	1983	1984	1985
Total current assets 1,000 dollars	341,945	349,200	356,014	380,852	394,380
Property, plant, and equipment, net—1,000 dollars	200,321	206,170	206,864	213,201	226,053
Total assets—do	584,118	598,080	606,184	646,666	672,218
Total current liabilities 1,000 dollars	105,632	95,107	89,964	91,175	77,324
Long-term debt due after 1 year—1,000 dollars	17,230	8,273	8,871	6,180	6,088
Total liabilities—do	143,039	126,562	123,468	124,664	112,904
Equity—do	441,079	471,518	482,716	522,002	559,314
Working capital—do	236,313	254,093	266,050	289,677	317,056
Current ratio—times	3.24	3.67	3.96	4.18	5.10
Total debt to equity—do	0.32	0.27	0.26	0.24	0.20
Return on investment ratios:					
Pretax income or (loss) to—					
Equity—percent	21.8	18.1	12.0	20.8	20.5
Total assets—do	16.4	14.3	9.6	16.8	17.0
Invested capital 1/-do	22.0	18.5	12.3	21.6	21.1

1/ Invested capital is defined as working capital plus net property, plant, and equipment.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

relative to their research and development expenses, as shown in the following tabulation (in thousands of dollars):

Year	Capital expenditures: Government regulations	Capital expenditures: Operations	Capital expenditures: Total	Research and development expenses
1981	177	5,603	5,780	***
1982	***	***	4,240	***
1983	***	***	2,463	***
1984	***	***	1,593	***
1985	223	4,303	4,526	***

Total capital expenditures declined from $5.8 million in 1981 to $1.6 million in 1984 and then rose to $4.5 million in 1985. Capital expenditures to comply with Government regulations dropped from $177,000 in 1981 to $*** in 1983 but increased to $223,000 in 1985. Research and development expenses increased irregularly from $*** in 1981 to $*** in 1985.

Financial experience of U.S. producers of compressor housings.—Thirteen producers of compressor housings, which together accounted for * * * percent of reported production of compressor housings in 1984, provided the Commission with usable financial information as presented below. 1/

Compressor housings.—Nine U.S. producers of compressor housings supplied usable income-and-loss data. Aggregate net sales of compressor housings declined from $101.0 million in 1981 to $73.4 million in 1982, or by 27 percent, and then increased by 42 percent to $104.3 million in 1984 (table I-22). During the interim periods ended December 31, sales dropped from $98.8 million in 1984 to $79.9 million in 1985, or by 19 percent.

The reporting firms earned an aggregate operating income of $1.4 million, or 1.4 percent of sales, in 1981, but they sustained an aggregate operating loss of $5.7 million, or 7.9 percent of sales, in 1982. In 1983, operating income of $1.3 million, or 1.5 percent of sales, was reported. Such income rose by 191 percent in 1984 to $3.7 million, or 3.6 percent of sales. During the interim period ended December 31, 1985, the industry suffered an aggregate operating loss of $2.8 million, or 3.5 percent of sales, compared with an operating income of $2.7 million, or 2.7 percent of sales in the corresponding period of 1984. Pretax net income margins followed a trend similar to the operating income margins.

Cash flow from operations decreased from a positive $4.9 million in 1981 to a negative $1.6 million in 1982 and then increased to a positive $5.8 million in 1984. Cash flow was a negative $761,000 million in the interim period of 1985 compared with a positive $4.6 million in the interim period of 1984. Operating losses were reported by two of the nine producers in 1981; such losses were sustained by five firms in 1982, four firms in 1983, and three firms in 1984. During the interim periods ended December 31, operating losses were sustained by three of the nine reporting firms in 1984 and by five of the nine firms in 1985.

All iron castings.—Usable income-and-loss data were received from 13 U.S. producers of compressor housings on their operations producing all iron castings. Reported net sales of all iron castings by the responding U.S. producers fell from $540.7 million in 1981 to $395.7 million in 1982, or by 27 percent, and then increased by 54 percent to $610.0 million in 1984 (table I-23). During the interim periods ended December 31, sales declined from $573.6 million in 1984 to $500.4 million in 1985, or by 13 percent.

The responding firms earned an aggregate operating income of $31.8 million, or 5.9 percent of sales, in 1981, but suffered an aggregate operating loss of 9.1 million, or 2.2 percent of sales, in 1982. In 1983, the reporting firms earned an aggregate operating income of $17.7 million, or 3.9 percent of sales. Such income rose to $56.0 million, or 9.2 percent of sales,

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1/ Only 1 of 13 firms' data are the same for compressor housings and all iron castings operations because that firm produces only one cast-iron product. No producer made a special allocation to derive data on all iron castings operations except one, which allocated only GS&A expenses. Three of the nine firms reporting data on compressor housings employed standard cost systems and, consequently, allocated only variances on pounds produced, whereas the remaining firms allocated all manufacturing costs on the basis of pounds produced. Some producers allocated GS&A expenses on the basis of either tons sold or sales dollars.

Table I-22.—Income-and-loss experience of 9 U.S. producers 1/ on their operations producing compressor housings, accounting years 1981-84 and interim periods ended Dec. 31, 1984, and Dec. 31, 1985

Item	1981	1982	1983	1984	Interim period ended Dec. 31—	
					1984	1985
Net sales————1,000 dollars—	101,024	73,435	84,019	104,326	98,839	79,853
Cost of goods sold————do————	94,544	74,066	77,394	95,324	91,088	76,715
Gross profit or (loss)—do———	6,480	(631)	6,625	9,002	7,751	3,138
General, selling, and administrative expenses 1,000 dollars—	5,115	5,142	5,342	5,269	5,066	5,929
Operating income or (loss) 1,000 dollars—	1,365	(5,773)	1,283	3,733	2,685	(2,791)
Interest expense 2/———do———	397	345	411	280	218	373
Other income or (expense) 2/ 1,000 dollars—	(349)	587	(548)	(1,163)	(1,162)	(1,170)
Net income or (loss) before income taxes 2/ 1,000 dollars—	619	(5,531)	324	2,290	1,305	(4,334)
Depreciation and amortization expense included above 1,000 dollars—	4,241	3,902	3,335	3,475	3,302	3,573
Cash flow from operations 3/ 1,000 dollars—	4,860	(1,629)	3,659	5,765	4,607	(761)
As a share of net sales:						
Cost of goods sold percent—	93.6	100.9	92.1	91.4	92.2	96.1
Gross profit or (loss) percent—	6.4	(.9)	7.9	8.6	7.8	3.9
General, selling, and administrative expenses percent—	5.1	7.0	6.4	5.1	5.1	7.4
Operating income or (loss) percent—	1.4	(7.9)	1.5	3.6	2.7	(3.5)
Net income or (loss) 2/ before income taxes percent—	.6	(7.5)	.4	2.2	1.3	(5.4)
Number of firms reporting operating losses—————	2	5	4	3	3	5
Number of firms reporting net losses—————	2	5	4	3	3	5

1/ These firms accounted for * * * percent of reported U.S. production of compressor housings in 1984.

2/ * * * firms, which accounted for * * * percent of reported 1984 net sales, did not provide the Commission with data on interest expenses and other income and expenses; hence, net income before taxes may be overstated or understated.

3/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table I-23.--Income-and-loss experience of 13 U.S. producers of compressor housings 1/ on their operations producing all iron castings, accounting years 1981-84 and interim periods ended Dec. 31, 1984, and Dec. 31, 1985

Item	1981	1982	1983	1984	Interim period ended Dec. 31-- 1984	Interim period ended Dec. 31-- 1985
Net sales--------1,000 dollars--	540,706	395,686	456,650	609,996	573,620	500,390
Cost of goods sold--------do------	461,924	361,001	395,385	508,355	475,924	414,161
Gross profit-------------do------	78,782	34,685	61,265	101,641	97,696	86,229
General, selling, and administrative expenses 1,000 dollars--	47,007	43,774	43,565	45,602	42,110	45,470
Operating income or (loss) 1,000 dollars--	31,775	(9,089)	17,700	56,039	55,586	40,759
Interest expense or (income), net----------1,000 dollars--	(8,126)	(8,554)	1,471	6,957	6,930	9,267
Other income or (expense) 1,000 dollars--	89	1,262	(1,733)	(7,051)	(7,015)	(4,859)
Net income before income taxes---------1,000 dollars--	39,990	727	14,496	42,031	41,641	26,633
Depreciation and amortization expense included above 2/ 1,000 dollars--	20,670	20,056	19,079	17,636	16,156	16,953
Cash flow from operations 3/ 1,000 dollars--	60,660	20,783	33,575	59,667	57,797	43,586
As a share of net sales:						
Cost of goods sold percent--	85.4	91.2	86.6	83.3	83.0	82.8
Gross profit-----------do-----	14.6	8.8	13.4	16.7	17.0	17.2
General, selling, and administrative expenses percent--	8.7	11.1	9.5	7.5	7.3	9.1
Operating income or (loss) percent--	5.9	(2.2)	3.9	9.2	9.7	8.1
Net income before income taxes-----------percent--	7.4	0.2	3.2	6.9	7.3	5.3
Number of firms reporting operating losses--------------	4	11	6	3	4	6
Number of firms reporting net losses------------------	4	10	6	3	4	5

1/ These firms accounted for * * * percent of reported U.S. production of compressor housings in 1984.
2/ * * * firm, which accounted for * * * percent of reported 1984 net sales, did not provide the Commission with data on depreciation and amortization.
3/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

in 1984. During the interim periods ended December 31, operating income dipped by 27 percent from $55.6 million, or 9.7 percent of sales, in 1984 to $40.8 million, or 8.1 percent of net sales, in 1985. The pretax net income margin followed the same trend as the operating income margin.

Cash flow from operations declined from $60.7 million in 1981 to $20.8 million in 1982 and then rose to $33.6 million in 1983 and $59.7 million in 1984. Such cash flow dropped to $43.6 million during the interim period of 1985, compared with $57.8 million during the interim period of 1984.

Operating losses were sustained by 4 of the 13 reporting firms in 1981, such losses were reported by 11 firms in 1982, 6 firms in 1983, and 3 firms in 1984. In the interim period of 1985, six firms sustained operating losses compared with four firms in the interim period of 1984.

Total net sales of compressor housings reported by nine firms (see table I-21) ranged between 23 and 27 percent of total net sales of their all iron castings during 1981-85. The income-and-loss data on all iron castings operations of those nine firms that supplied such data on their compressor housings operations are summarized in the following tabulation:

Item	1981	1982	1983	1984	Interim period ended Dec. 31—	
					1984	1985
Net sales 1,000 dollars—	376,155	288,743	337,777	450,394	431,322	364,892
Operating income or (loss) 1,000 dollars—	21,924	(8,375)	13,195	45,710	44,714	36,760
Operating income or (loss) margin percent—	5.8	(2.9)	3.9	10.1	10.4	10.1
Ratio of compressor housing net sales to all iron castings net sales percent—	26.9	25.4	24.9	23.2	22.9	21.9

<u>Overall operations</u>.—Ten U.S. producers of compressor housings supplied financial data on their companies' overall or divisional operations for accounting years 1981-85. Net sales declined from $411.9 million in 1981 to $372.1 million in 1982, or by 10 percent, and then increased to $516.7 million in 1984. Such sales dropped slightly by 2 percent to $504.0 million in 1985 (table I-24). Aggregate operating income, which dropped faster than net sales, fell by 61 percent from $6.3 million in 1981 (1.5 percent of net sales) to $2.5 million in 1982 (0.7 percent of net sales); such income rose to $35.3 million (6.8 percent of net sales) in 1984 and then declined to $23.1 million (4.6 percent of net sales) in 1985. Aggregate pretax net income margins followed a similar trend as the operating income margins.

Table I-24.--Income-and-loss experience of 10 U.S. producers of compressor housings 1/ on their companies' overall or divisional operations, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales----1,000 dollars---	411,933	372,145	424,803	516,704	503,960
Cost of goods sold------do----	371,038	334,548	371,412	433,192	428,453
Gross profit----------do----	40,895	37,597	53,391	83,512	75,507
General, selling, and administrative expenses 1,000 dollars---	34,560	35,139	39,026	48,239	52,415
Operating income--------do----	6,335	2,458	14,365	35,273	23,092
Interest expense or (income), net 2/-----1,000 dollars---	(3,059)	851	1,110	1,509	4,093
Other income or (expense) 2/ 1,000 dollars---	(688)	782	(3,312)	(3,337)	(2,356)
Net income before income taxes 2/----1,000 dollars---	8,706	2,389	9,943	30,427	16,643
Depreciation and amortization expense included above 1,000 dollars---	16,671	18,349	19,765	18,249	18,907
Cash flow from operations 3/ 1,000 dollars---	25,377	20,738	29,708	48,676	35,550
As a share of net sales:					
Cost of goods sold percent---	90.1	89.9	87.4	83.8	85.0
Gross profit--------do----	9.9	10.1	12.6	16.2	15.0
General, selling, and administrative expenses percent---	8.4	9.4	9.2	9.3	10.4
Operating income------do----	1.5	.7	3.4	6.8	4.6
Net income before income taxes 2/--------percent---	2.1	.6	2.3	5.9	3.3
Number of firms reporting operating losses------------	3	7	5	2	4
Number of firms reporting net losses----------------	3	8	5	2	4

1/ These firms accounted for * * * percent of reported U.S. production of compressor housings in 1985.

2/ * * * firm, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on interest expenses and other income and expenses; hence, net income before taxes may be overstated or understated.

3/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Financial condition of U.S. producers.—Key balance sheet information and selected financial ratios of the 10 U.S. producers of compressor housings that provided income-and-loss data on their overall or divisional operations are presented in table I-25.

The current ratio for the reporting producers declined from 2.23 in 1981 to 2.07 in 1983 and then increased to 2.38 in 1984 before dipping to 1.57 in 1985. A current ratio of more than 2.0 is normally considered to be strong. Aggregate working capital dropped from $54.5 million in 1981 to $53.0 million in 1982, or by 3 percent, and then rose by 48 percent to $78.7 million in 1984, before declining to $47.9 million in 1985. The net value of property, plant, and equipment increased from $120.4 million in 1981 to $146.2 million in 1983 and then declined to $134.8 million in 1984 and $141.8 million in 1985. Total assets increased by 31 percent during 1981-85. The ratio of debt to equity for the 10 firms increased irregularly by 86 percent during 1981-85. All of the different measures of return on investment showed generally a similar trend, declining from 1981 to 1982, rising in 1983 to about the levels of 1981, peaking in 1984, and then dropping in 1985.

Investment in property, plant, and equipment.—Five U.S. producers provided data concerning their investment in facilities employed in the production of compressor housings, as presented in the following tabulation (in thousands of dollars):

*   *   *   *   *   *   *

Aggregate investment in productive facilities, valued at cost, decreased from $*** in 1981 to $*** in 1983 and then rose to $*** in 1985. The reason for the sudden drop in such investment in 1983 is that * * *. The investment rose to $*** in the interim period of 1985 compared with $*** in the interim period of 1984. The book value of such facilities generally followed the same trend as the original cost of investment.

Capital expenditures and research and development expenses.—Five U.S. producers supplied data relative to their capital expenditures to comply with Government regulations and for building, machinery, and equipment used in the production of compressor housings, and three U.S. producers provided data relative to their research and development expenses, as shown in the following tabulation (in thousands of dollars):

*   *   *   *   *   *   *

Total capital expenditures declined from $*** in 1981 to $*** in 1983 and then rose to $*** in 1984. Such expenditures dropped to $*** during the interim period of 1985 compared with $*** in the corresponding period of 1984. Capital expenditures to comply with Government regulations dropped from $*** in 1981 to $*** in 1982, $*** in 1983, and $*** in 1984 and 1985. Research and development expenses increased irregularly from $*** in 1981 to $*** in 1984 and then declined to $*** during the interim period of 1985.

Table I-25.—Selected balance sheet and financial ratios of 10 U.S. producers 1/ of compressor housings on their overall or divisional operations, as of the end of accounting years 1981-85

Item	1981	1982	1983	1984	1985
Total current assets 1,000 dollars	98,972	97,628	132,456	135,765	132,052
Property, plant, and equipment, net—1,000 dollars	120,432	144,689	146,170	134,802	141,840
Total assets—do	222,494	249,585	288,525	287,622	290,419
Total current liabilities 1,000 dollars	44,461	44,579	63,892	57,104	84,174
Long-term debt due after 1 year—1,000 dollars	14,991	47,580	37,316	34,257	34,768
Total liabilities—do	68,373	105,234	115,509	106,955	130,752
Equity—do	154,121	144,351	173,016	180,667	159,667
Working capital—do	54,511	53,049	68,564	78,661	47,878
Current ratio—times	2.23	2.19	2.07	2.38	1.57
Total debt to equity—do	0.44	0.73	0.67	0.59	0.82
Return on investment ratios:					
Pretax income or (loss) to—					
Equity—percent	5.6	1.7	5.7	16.8	10.4
Total assets—do	3.9	1.0	3.4	10.6	5.7
Invested capital 1/—do	5.0	1.2	4.6	14.3	8.8

1/ Invested capital is defined as working capital plus net property, plant, and equipment.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

<u>Financial experience of U.S. producers of brake drums and rotors</u>.—Eleven producers of brake drums and rotors, which together accounted for * * * percent of reported production of brake drums and rotors in 1984, provided the Commission with usable financial information, as presented below. 1/

<u>Brake drums and rotors</u>.—Ten U.S. producers of brake drums and rotors supplied usable income-and-loss data. Aggregate net sales of brake drums and rotors declined from $202.1 million in 1981 to $188.3 million in 1982, or by 7 percent, and then increased by 54 percent to $289.6 million in 1984 (table I-26). During the interim periods ended December 31, however, sales fell from $245.3 million in 1984 to $229.8 million in 1985, or by 6 percent.

Aggregate operating income fell from $8.4 million, or 4.2 percent of sales, in 1981 to $2.9 million, or 1.6 percent of sales, in 1982. In 1983, operating income increased by over six fold to 21.0 million, or 9.1 percent of sales, then rose again by 30 percent in 1984 to $27.3 million, or 9.4 percent of sales. During the interim periods ended December 31, operating income fell by 46 percent from $23.3 million in 1984, or 9.5 percent of sales, to $12.6 million in 1985, or 5.5 percent of sales. Pretax net income margins followed a trend similar to the operating income margins.

Cash flow from operations decreased from $17.3 million in 1981 to $11.7 million in 1982, jumped to $29.7 million in 1983, and then increased to $37.1 million in 1984. Cash flow fell to $19.5 million in the interim period of 1985, compared with $31.6 million in the interim period of 1984. Operating losses were reported by 6 of the 10 producers in 1981; such losses were sustained by 7 firms in 1982, 5 firms in 1983, and 4 firms in 1984. During the interim periods ended December 31, operating losses were sustained by four firms in 1984 and by seven firms in 1985.

Intra- and intercompany transfers ranged between * * * and * * * percent of the total net sales of brake drums and rotors during each period discussed above. * * * accounted for all of the intra- and intercompany sales. Key income-and-loss data for the reporting firms that had no intra- and intercompany sales are shown in the following tabulation:

* * * * * * *

The operating income margins shown in the above tabulation were lower than the operating income margins for the 10 reporting firms shown in table I-25 but they generally followed the same trend, except in 1984.

1/ Three of eleven firms' data are the same for brake drums and rotors and all iron castings operations because they produced only one cast-iron product. Seven of eleven firms made no special allocations to derive data on all iron castings operations; three firms allocated only GS&A expenses, on the basis of either time spent or sales dollars. Five of the ten firms reporting data on brake drums and rotors allocated all manufacturing costs on the basis of tons processed or produced; one firm used man-hours worked, and another firm, which employs a standard cost system, allocated variances only.

Table I-26.—Income-and-loss experience of 10 U.S. producers 1/ on their operations producing brake drums and rotors, accounting years 1981-84 and interim periods ended Dec. 31, 1984, and Dec. 31, 1985

Item	1981	1982	1983	1984	Interim period ended Dec. 31—	
					1984	1985
Net sales:						
Trade————1,000 dollars—	154,334	151,541	184,870	205,756	161,419	141,697
Intra- and intercompany transfers—1,000 dollars—	47,776	36,791	46,123	83,847	83,847	88,075
Total————do—	202,110	188,332	230,993	289,603	245,266	229,772
Cost of goods sold————do—	184,566	174,763	197,735	246,356	207,498	203,068
Gross profit————do—	17,544	13,569	33,258	43,247	37,768	26,704
General, selling, and administrative expenses 1,000 dollars—	9,146	10,630	12,305	15,945	14,464	14,061
Operating income————do—	8,398	2,939	20,953	27,302	23,304	12,643
Interest expense or (income), net 2/————1,000 dollars—	235	209	44	(36)	(120)	(290)
Other income or (expense) 2/ 1,000 dollars—	612	177	209	430	372	(667)
Net income before income taxes 2/————1,000 dollars—	8,775	2,907	21,118	27,768	23,796	12,266
Depreciation and amortization expense included above 1,000 dollars—	8,487	8,788	8,626	9,293	7,816	7,211
Cash flow from operations 3/ 1,000 dollars—	17,262	11,695	29,744	37,061	31,612	19,477
As a share of net sales:						
Cost of goods sold percent—	91.3	92.8	85.6	85.1	84.6	88.4
Gross profit————do—	8.7	7.2	14.4	14.9	15.4	11.6
General, selling, and administrative expenses percent—	4.5	5.6	5.3	5.5	5.9	6.1
Operating income————do—	4.2	1.6	9.1	9.4	9.5	5.5
Net income 2/ before income taxes————percent—	4.3	1.5	9.1	9.6	9.7	5.3
Number of firms reporting operating losses————	6	7	5	4	4	7
Number of firms reporting net losses————	5	7	5	4	4	6

1/ These firms accounted for * * * percent of reported U.S. production in 1984.

2/ * * * firms, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on interest expenses and other income and expenses; hence, net income before taxes may be overstated or understated.

3/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

<u>All iron castings</u>.--Usable income-and-loss data were received from 11 U.S. producers of brake drums and rotors on their operations producing all iron castings. Reported net sales of all iron castings by the responding U.S. producers fell from $1.1 billion in 1981 to $920 million in 1982, or by 15 percent, and then increased by 59 percent to $1.5 billion in 1984 (table I-27). During the interim period ended December 31, 1985 sales were $***, representing an increase of 3 percent over sales in the interim period of 1984.

Aggregate operating income declined by 19 percent from $76.5 million, or 7.0 percent of sales, in 1981 to $62.4 million, or 6.8 percent of sales, in 1982, and then rose to $183.1 million, or 12.5 percent of sales, in 1984. During the interim periods ended December 31, operating income fell by 29 percent from $***, or * * * percent of sales, in 1984 to $***, or * * * percent of net sales, in 1985. The pretax net income margin followed the same trend as the operating income margin.

Cash flow from operations declined from $121.5 million in 1981 to $103.2 million in 1982 and then rose to $195.2 million in 1983 and $220.3 million in 1984. However, cash flow dropped from $*** during the interim period of 1984, to $*** during the interim period of 1985.

Operating losses were sustained by 5 of the 11 reporting firms in 1981. Such losses were reported by seven firms in 1982, three firms in 1983, and one firm in 1984. Two firms sustained losses in the interim period of 1984 and four firms did so in the interim period of 1985.

Intra- and intercompany transfers constituted * * * to * * * percent of the total net sales of all iron castings in each period discussed above. * * * accounted for the bulk of the intracompany sales. Pertinent income and loss data for the reporting firms that had no or relatively small intra- and intercompany transfers are presented in the following tabulation:

* * * * * * *

The operating income margins shown in the above tabulation were lower than the operating income margins for all 11 reporting firms (table I-26), but they generally followed the same trend except in 1984. Further, operating income margins of the 11 firms showed a much steeper decline during the interim periods of 1984 and 1985.

Total net sales of brake drums and rotors reported by 10 firms (see table I-25) ranged between * * * and * * * percent of total net sales of their all iron castings during 1981-85. The income-and-loss data on all iron castings operations of those 10 firms that supplied such data on their brake drums and rotors operations are summarized in the following tabulation:

* * * * * * *

Table I-27.—Income-and-loss experience of 11 U.S. producers of brake drums and rotors 1/ on their operations producing all iron castings, accounting years 1981-84 and interim periods ended Dec. 31, 1984, and Dec. 31, 1985

Item	1981	1982	1983	1984	Interim period ended Dec. 31— 1984	1985
Net sales:						
Trade—1,000 dollars—	345,746	329,650	369,021	453,976	***	***
Intra- and intercompany transfers 1,000 dollars—	741,193	590,377	789,783	1,012,310	***	***
Total—do—	1,086,939	920,027	1,158,804	1,466,286	***	***
Cost of goods sold—do—	972,014	807,038	949,079	1,201,515	***	***
Gross profit—do—	114,925	112,989	209,725	264,771	***	***
General, selling, and administrative expenses 1,000 dollars—	38,378	50,636	54,811	81,628	***	***
Operating income—do—	76,547	62,353	154,914	183,143	***	***
Interest expense 2/—do—	3,780	4,393	3,916	3,449	***	***
Other income or (expense) 2/ 1,000 dollars—	411	(1,825)	905	40	***	(***)
Net income before income taxes 2/—1,000 dollars—	73,178	56,135	151,903	179,734	***	***
Depreciation and amortization expense included above 3/ 1,000 dollars—	48,287	47,031	43,254	40,557	***	***
Cash flow from operations 4/ 1,000 dollars—	121,465	103,166	195,157	220,291	***	***
As a share of net sales:						
Cost of goods sold percent—	89.4	87.7	81.9	81.9	***	***
Gross profit—do—	10.6	12.3	18.1	18.1	***	***
General, selling, and administrative expenses percent—	3.5	5.5	4.7	5.6	***	***
Operating income—do—	7.0	6.8	13.4	12.5	***	***
Net income 2/ before income taxes—percent—	6.7	6.1	13.1	12.3	***	***
Number of firms reporting operating losses—	5	7	3	1	2	4
Number of firms reporting net losses—	4	7	3	1	2	4

1/ These firms accounted for * * * percent of reported U.S. production of brake drums and rotors in 1984.

2/ * * * firms, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on interest expenses and other income and expenses; hence, net income before taxes may be overstated or understated.

3/ * * * firm, which accounted for * * * percent of reported 1984 net sales, did not provide the Commission with data on depreciation and amortization.

4/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Overall operations.—Nine U.S. producers of brake drums and rotors supplied financial data on their companies' overall or divisional operations for accounting years 1981-85. Net sales declined from $1.6 billion in 1981 to $1.4 billion in 1982, or by 14 percent, and then increased by 49 percent to $2.1 billion in 1985 (table I-28). Aggregate operating income, which dropped faster than net sales, fell by 58 percent from $80.6 million in 1981 (4.9 percent of net sales) to $33.5 million in 1982 (2.4 percent of net sales); such income rose to $161.6 million (8.1 percent of net sales) in 1984 and then declined to $90.1 million (4.3 percent of net sales) in 1985. The majority of the large "other expense" item reflects unusual expenses reported by * * *. Aggregate pretax net income margins were lower than the operating income margins but followed a similar trend.

Financial condition of U.S. producers.—Key balance sheet information and selected financial ratios of the nine U.S. producers of brake drums and rotors that provided income-and-loss data on their overall or divisional operations are presented in table I-29.

The current ratio for the reporting producers increased from 2.62 in 1981 to 2.67 in 1982 and then declined to 2.02 in 1984 and 1.60 in 1985. A current ratio of more than 2.0 is normally considered to be strong. Aggregate working capital decreased from $246.7 million in 1981 to $205.2 million in 1983, or by 17 percent, increased slightly to $208.5 million in 1984, and then dropped by 23 percent to $161.1 million in 1985. The net value of property, plant, and equipment declined from $621.1 million in 1981 to $505.1 million in 1984 and then increased slightly to $507.1 million in 1985. Total assets decreased by 12 percent from 1981 to 1983 and then increased by 5 percent during 1983-85. The ratio of debt to equity for the nine firms increased irregularly by 77 percent during 1981-85. All of the different measures of return on investment showed a similar trend, declining from 1981 to 1982, rising in 1983, peaking in 1984, and then dropping again in 1985.

Investment in property, plant, and equipment.—Eight U.S. producers provided data concerning their investment in facilities employed in the production of brake drums and rotors, as presented in the following tabulation (in thousands of dollars):

Period	Original cost	Book value
1981	116,431	56,322
1982	121,633	53,375
1983	118,391	50,638
1984	144,116	53,463
Interim period ended Dec. 31—		
1984	145,872	53,492
1985	154,700	55,243

Aggregate investment in productive facilities, valued at cost, increased from $116.4 million in 1981 to $121.6 million in 1982 and then declined to $118.4 million in 1983 before rising to $144.1 million in 1984. Such investment grew by 6 percent, from $145.9 million in the interim period of 1984 to $154.7 million in the interim period of 1985. The book value of such

Table I-28.--Income-and-loss experience of 9 U.S. producers of brake drums and rotors 1/ on their companies' overall or divisional operations, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales--------1,000 dollars---	1,631,028	1,395,488	1,641,362	1,997,849	2,083,387
Cost of goods sold--------do------	1,457,428	1,256,749	1,400,762	1,711,859	1,824,028
Gross profit----------------do------	173,600	138,739	240,600	285,990	259,359
General, selling, and administrative expenses 1,000 dollars---	92,958	105,226	112,085	124,404	169,278
Operating income----------do------	80,642	33,513	128,515	161,586	90,081
Interest expense or (income) 1,000 dollars---	518	(1,008)	(1,520)	(2)	1,163
Other (expense), net-----do------	(12,158)	(21,729)	(22,857)	(874)	(8,110)
Net income before income taxes --------1,000 dollars---	67,966	12,792	107,178	160,714	80,808
Depreciation and amortization expense included above 1,000 dollars---	89,454	88,983	86,452	81,596	79,777
Cash flow from operating 2/ 1,000 dollars---	157,420	101,775	193,630	242,310	160,585
As a share of net sales:					
Cost of goods sold percent---	89.4	90.1	85.3	85.7	87.6
Gross profit--------------do------	10.6	9.9	14.7	14.3	12.4
General, selling, and administrative expenses percent---	5.7	7.5	6.8	6.2	8.1
Operating income--------do------	4.9	2.4	7.8	8.1	4.3
Net income before income taxes 2/-----------percent---	4.2	0.9	6.5	8.0	3.9
Number of firms reporting operating losses----------------	1	3	2	0	1
Number of firms reporting net losses------------------------	1	4	1	0	1

1/ These firms accounted for * * * percent of reported U.S. production of brake drums and rotors in 1985.
2/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table I-29.—Selected balance sheet and financial ratios of 9 U.S. producers 1/ of brake drums and rotors on their overall or divisional operations, as of the end of accounting years 1981-85

Item	1981	1982	1983	1984	1985
Total current assets 1,000 dollars	399,079	353,814	382,129	412,524	427,879
Property, plant, and equipment, net—1,000 dollars	621,126	584,284	531,691	505,149	507,075
Total assets—do	1,049,077	960,993	927,603	944,482	975,780
Total current liabilities 1,000 dollars	152,420	132,637	176,938	204,009	266,774
Long-term debt due after 1 year—1,000 dollars	262,835	269,233	167,626	196,554	211,486
Total liabilities—do	459,169	447,595	422,904	487,494	565,738
Equity—do	589,908	513,398	504,699	456,988	410,042
Working capital—do	246,659	221,177	205,191	208,515	161,105
Current ratio—times	2.62	2.67	2.16	2.02	1.60
Total debt to equity—do	0.78	0.87	0.84	1.07	1.38
Return on investment ratios:					
Pretax income or (loss) to—					
Equity—percent	11.5	2.5	21.2	35.2	19.7
Total assets—do	6.5	1.3	11.6	17.0	8.3
Invested capital 1/—do	7.8	1.6	14.5	22.5	12.1

1/ Invested capital is defined as working capital plus net property, plant, and equipment.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

facilities generally followed the same trend as the original cost of investment.

Capital expenditures and research and development expenses.—Eight U.S. producers supplied data relative to their capital expenditures to comply with Government regulations and for building, machinery, and equipment used in the production of brake drums and rotors, and six U.S. producers provided data relative to their research and development expenses, as shown in the following tabulation (in thousands of dollars):

Period	Capital expenditures: Government regulations	Capital expenditures: Operations	Capital expenditures: Total	Research and development expenses
1981	660	6,289	6,949	997
1982	495	11,870	12,365	798
1983	805	4,281	5,086	1,276
1984	1,709	***	***	1,798
Interim period ended Dec. 31—				
1984	1,735	***	***	1,750
1985	1,822	***	***	2,416

Total capital expenditures increased from $6.9 million in 1981 to $12.4 million in 1982 and then declined to $5.1 million in 1983 before rising to $*** in 1984. Such expenditures dropped to $*** during the interim period of 1985 compared with $*** in the corresponding period of 1984. Capital expenditures to comply with Government regulations dropped from $660,000 in 1981 to $495,000 in 1982 but then increased in each period to $1.8 million during the interim period of 1985 compared with $1.7 million in the interim period of 1984. Research and development expenses decreased from $997,000 in 1981 to $798,000 in 1982 and then rose to $1.8 million in 1984. Such expenses grew to $2.4 million during the interim period of 1985 compared with $1.8 million in the interim period ended December 31, 1984.

Summary of operating income-and-loss data.--The ratios of operating income or loss to net sales reported by U.S. producers of the four iron products subject to this investigation and such producers' overall iron castings operations and overall company or division operations are summarized in table I-30. For comparison, data are also presented for the comparable profitability ratios compiled by the Bureau of the Census for all manufacturing companies, all durable goods producers, and all producers of iron and steel products, and by Robert Morris Associates for all iron and steel foundries.

The Question of the Threat of Serious Injury

Information on the capacity, production, domestic consumption, and exports of the subject products in countries that export to the United States is presented in the introductory section of this report.

U.S. importers' inventories of imported iron castings

U.S. importers' yearend inventories of imported iron castings are presented in table I-31. Inventories of imports of construction castings increased irregularly from 5,261 tons in 1981 to 13,377 tons in 1984 and then decreased to 10,605 tons in 1985. Inventories of imports of the other three subject iron products increased irregularly during 1981-85--inventories of pipe fittings increased from * * * tons to 4,223 tons, or by more than * * *; inventories of compressor housings increased from * * * tons to 439 tons, or by nearly * * *; and inventories of brake drums and rotors, after dipping by 18 percent to * * * tons in 1982, increased to 7,282 tons in 1984 and further increased to 10,924 tons in 1985, or by 50 percent.

Yearend inventories of imported construction castings and imported brake drums and rotors, as a share of yearly imports, decreased irregularly during 1981-85; such inventories of construction castings decreased from 25 percent in 1981 to 14 percent in 1985, and inventories of brake drums and rotors decreased from *** percent in 1981 to 12 percent in 1985. The ratio of yearend inventories to imports of pipe fittings was erratic during the period, fluctuating between a low of 35 percent in 1983 to a high of 59 percent in 1984. The ratio of inventories to imports of compressor housings jumped from * * * percent of imports in 1981 to 32 percent in 1983 and then irregularly decreased to 20 percent in 1985.

Table I-30.—Ratios of operating income or loss to net sales for all manufacturing firms, all producers of durable goods, iron and steel producers, iron and steel foundries, and producers of certain iron castings subject to this investigation, accounting years 1981-84 and interim periods ended Dec. 31, 1984, and Dec. 31, 1985

(In percent)

Item	1981	1982	1983	1984	Interim period ended Dec. 31— 1984	Interim period ended Dec. 31— 1985
All manufacturing firms 1/	6.7	5.1	5.9	6.8	6.8	5.9
Manufacturers of durable goods 1/	6.5	4.1	5.0	6.6	6.6	5.4
Iron & steel (ESIC33.1-2) 1/	5.9	(4.3)	(1.5)	2.6	2.6	0.6
Iron & steel foundries (SIC Nos. 3321-22,24,25) 2/	6.4	0.2	(1.9)	4.4	4.4	3/
Producers of construction castings on their operations on—						
Construction castings	5.0	4.2	5.6	7.1	7.6	7.6
All iron castings	8.8	5.3	7.3	10.5	11.4	9.8
Overall companies or divisions	9.5	7.8	6.1	9.5	9.5	8.0
Producers of pipe fittings on their operations on—						
Pipe fittings	9.2	4.9	(0.6)	5.4	5.4	6.6
All iron castings	10.0	8.2	5.2	9.1	9.1	8.9
Overall companies or divisions	10.5	10.2	7.6	11.5	11.5	11.9
Producers of compressor housings on their operations on—						
Compressor housings	1.4	(7.9)	1.5	3.6	2.7	(3.5)
All iron castings	5.9	(2.2)	3.9	9.2	9.7	8.1
Overall companies or divisions	1.5	0.7	3.4	6.8	6.8	4.6
Producers of brake drums and rotors on their operations on—						
Brake drums and rotors	4.2	1.6	9.1	9.4	9.5	5.5
All iron castings	7.0	6.8	13.4	12.5	***	***
Overall companies or divisions	4.9	2.4	7.8	8.1	8.1	4.3

1/ Derived from data published in Quarterly Financial Reports for Manufacturing, Mining, and Trade Corporations, Bureau of the Census.
2/ Compiled from 1985 Annual Statements Studies, Robert Morris Associates.
3/ Not available.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission, except as noted.

Table I-31.—Certain iron castings: U.S. importers' yearend inventories, by types, 1981-85

Product	1981	1982	1983	1984	1985
	Quantity (tons)				
Construction castings	5,261	5,125	7,509	13,377	10,605
Pipe fittings:					
Rough castings:					
Ductile	***	***	***	***	***
Other	***	***	***	***	***
Total	***	1,794	1,464	3,722	4,223
Compressor housings	***	***	233	307	439
Brake drums and rotors	***	***	***	7,282	10,924
	Share of U.S. imports (percent)				
Construction castings	25.4	20.6	17.9	20.0	13.6
Pipe fittings	***	43.2	35.4	58.6	39.9
Compressor housings	***	***	32.4	17.4	20.2
Brake drums and rotors	***	***	***	11.9	12.0

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

The Question of Imports as a Substantial Cause of Serious Injury or the Threat Thereof

Market penetration

Construction castings.—The share of the U.S. market accounted for by imports of construction castings increased throughout the period from 11.6 percent in 1981 to 27.2 percent in 1985 (table I-32). Imports from India accounted for 13.8 percent of the U.S. market for construction castings in 1985; other principal sources in 1985 were Canada, Brazil, China, and Mexico, which supplied 5.3 percent, 2.8 percent, 2.8 percent, and * * * percent, respectively.

Table I-32.—Certain iron castings: Ratios of U.S. imports to consumption, 1/ by types, 1981-85

(In percent)

Item	1981	1982	1983	1984	1985
Construction castings	11.6	14.2	19.7	25.3	27.2
Pipe fittings	***	4.3	3.7	5.0	8.3
Compressor housings	1.7	1.3	.8	1.5	2.6
Brake drums and rotors	5.3	6.8	8.6	8.4	13.0

1/ On the basis of weight.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Pipe fittings.—The share of the U.S. market accounted for by imports of pipe fittings increased irregularly from * * * percent in 1981 to 8.3 percent in 1985. Imports from Korea accounted for the bulk of these imports, or 5.9 percent of the U.S. market for pipe fittings in 1985, and China accounted for * * * percent.

Compressor housings.—The share of the U.S. market accounted for by imports of compressor housings was small during 1981-85, ranging from 0.8 to 2.6 percent. Imports from Brazil, the largest supplier, accounted for * * * percent of the U.S. market for compressor housings in 1985 and the United Kingdom accounted for * * * percent.

Brake drums and rotors.—The share of the U.S. market accounted for by imports of brake drums and rotors increased from 5.3 percent in 1981 to 13.0 percent in 1985. Imports from Canada accounted for 9.7 percent of the U.S. market for brake drums and rotors in 1985 and Mexico accounted for 2.7 percent.

Prices

The price discussion is separated into three major sections: Introduction, pricing overview, and a discussion of questionnaire price data. The introduction discusses the importance of prices in determining total demand for the subject iron casting products and demand for the U.S.-produced vis-a-vis imported iron casting products. The overview presents the relative movement of U.S. producers' prices for all cast-iron foundry products and for other selected products sold in the United States. A detailed discussion of price data obtained from Commission questionnaires on specific U.S.-produced and imported cast-iron products is presented in the section on questionnaire price data.

Introduction. 1/—Cast-iron construction castings, pipe fittings for water main pressure pipes, compressor housings, and brake drums and rotors are generally only a small part of the cost of building projects or the final products using these items. Accordingly, changes in prices of the subject cast-iron products do not significantly change total demand for these products. But market conditions in industries that require the subject iron casting products as inputs, such as construction, utilities, oil refineries, and motor vehicles, significantly affect both total demand and prices of these cast-iron products. Changes in the price of the U.S.-produced product vis-a-vis the imported product, however, may significantly shift demand to the lower priced products. 2/ The subject U.S.-produced and imported products are generally comparable in quality, although U.S. producers enjoy some advantages in terms of quick delivery, service, and product liability. As import prices become significantly lower than U.S. producer prices, the relative advantages of U.S. producers are reduced and demand shifts to the imported iron casting products. 3/ Such a shift in demand to the imported products, however, may be

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1/ Most of the information discussed in this section was obtained through discussions with representatives of U.S. foundries, importers, and purchasers of the subject iron casting products during Commission staff field trips on Jan. 26-30, Mar. 6, and Mar. 9-16, 1986.

2/ Changes in exchange rates are one factor affecting the relative price competitiveness of U.S.-produced versus imported castings. Exchange rates are discussed in the introductory section of this report.

3/ Increased competition in the end-use industries has led U.S. producers that purchase the subject iron castings to discover new, lower priced supply sources, including foreign suppliers.

slowed by length of contracts (usually 1 year) and by foundry ownership of the patterns. The contracts lock in the current suppliers for a period of time and foundry ownership of the patterns generally gives the current supplying foundry a cost advantage over potential competitors, which could incur substantial costs to build new patterns. 1/ Even when the purchasing firm owns the pattern, current suppliers may still have a cost advantage over potential rivals because it is expensive to modify patterns to fit the equipment of a different foundry. Also limiting import competition for the subject iron castings are "buy America" policies and specifications that are relatively more costly for the foreign foundries to meet. 2/

Pricing overview.—Indexes of U.S. producers' selling prices of selected commodity categories are presented for comparison purposes in table I-33, by quarters, from January 1981 to December 1985 and annually, 1981-85. 3/ The producer price index for all gray- and ductile-iron products has generally risen during the period, by approximately 14 percent on a quarterly basis and 12 percent on an annual basis. These increases are greater than the rise in the producer price index for all products, which, during the same period, rose by approximately 8 percent on a quarterly basis and 5 percent on an annual basis. Trends in costs of gray-iron foundries were mixed during January 1981-December 1985, with some costs rising while others were declining. 4/ Indexes of prices of industrial electric power and of hourly earnings of production workers in gray-iron foundries generally rose during the period, by approximately 35 and 24 percent, respectively, on a quarterly basis or by about 26 and 20 percent, respectively, on an annual basis. On the other hand, prices of cast-iron scrap and of coke, two major material inputs of gray-iron foundries, generally decreased during the period, by approximately 25 percent and 1 percent, respectively, on a quarterly basis. On an annual basis during 1981-85, the price of cast-iron scrap decreased by about 18 percent and the price of coke decreased by about 6 percent.

1/ New pattern costs may not always be a barrier to import competition as some foreign firms may have significantly lower pattern costs than U.S. firms. * * * stated that some foreign firms can build patterns at a much lower cost than U.S. firms. * * * cited tooling costs of $1,500 in Taiwan versus $10,000 in the United States for a popular size hub and rotor product that fits most mid-size * * * cars. * * * purchases brake drums and rotors for autos and light trucks, * * * selling them to the aftermarket. * * * imports * * * and sells them to the aftermarket. (Commission staff field trip to * * *.)

2/ Hearing testimony by respondents indicates that buy American policies and discriminatory labeling requirements have limited imports of some of the iron construction castings. In addition, some municipalities require that bidding foundries must pay for plant inspections and iron testing by the purchaser, thereby further limiting import competition. (Official Transcript of the hearing, pp. 243-244 and 256-263.)

3/ These price indexes were based on Producer Price Indexes (PPI) compiled and reported by the Bureau of Labor Statistics, U.S. Department of Labor. The PPI is compiled and published monthly and represents percentage changes in U.S. producers' selling prices, requested on a transaction basis.

The annual data, which are an average of the quarterly data and may differ in magnitude but not direction with the quarterly data, offer a summary view of price trends over a 5-year period.

4/ Gray-iron foundries produce both gray- and ductile-iron products.

Table I-33.—Indexes of selected producer prices and selected gray-iron foundry costs, by quarters, January 1981-December 1985, and annual, 1981-85

Period	Producer Price Index		Indexes of gray-iron foundry costs			
	All products	All gray/ductile iron products 1/	No. 1 cupola cast-iron scrap	Industrial electric power 500kw	Coke	Hourly earnings of production workers 2/
1981:						
January-March	100.0	100.0	100.0	100.0	100.0	100.0
April-June	102.3	100.8	96.3	102.8	106.0	102.9
July-September	103.0	101.6	93.1	108.0	109.2	103.0
October-December	102.9	103.1	84.5	110.5	109.2	103.4
1982:						
January-March	103.7	104.8	84.0	115.5	109.0	104.7
April-June	103.8	105.4	71.8	117.4	108.3	106.8
July-September	104.3	104.9	64.1	118.9	106.9	110.4
October-December	104.4	106.3	62.1	120.2	105.2	107.0
1983:						
January-March	104.5	107.4	65.6	120.8	104.6	110.8
April-June	104.8	109.1	69.3	120.5	102.6	112.6
July-September	105.9	108.3	70.8	121.8	103.8	114.4
October-December	106.4	108.9	72.2	123.4	102.5	114.5
1984:						
January-March	107.6	110.6	78.2	124.2	100.4	117.0
April-June	108.3	112.5	75.4	127.2	102.8	116.0
July-September	108.0	113.0	71.7	129.6	101.9	116.5
October-December	107.7	112.6	74.8	130.7	100.8	119.0
1985:						
January-March	107.5	112.8	77.9	131.9	101.7	121.6
April-June	107.6	113.7	77.2	132.6	99.9	122.3
July-September	106.9	114.2	74.6	133.1	99.6	121.9
October-December	107.6	113.9	74.9	135.1	99.2	124.4
Annual:						
1981	100.0	100.0	100.0	100.0	100.0	100.0
1982	102.0	103.9	75.4	112.1	101.2	104.8
1983	103.3	107.0	74.4	115.5	97.4	110.5
1984	105.8	110.6	80.3	121.4	95.6	114.5
1985	105.3	112.1	81.5	126.4	94.4	119.7

1/ Produced in gray-iron foundries.
2/ Production workers in gray-iron foundries only.

Source: Compiled from official statistics of the U.S. Bureau of Labor Statistics.

Note: January-March 1981=100 for quarterly data; 1981=100 for annual data.

Questionnaire price data.—Quarterly net f.o.b. (U.S. locations) and delivered selling price data were requested from U.S. producers and importers of representative cast-iron products subject to this investigation on sales to their leading customers during January 1981–December 1985. If a producer or importer did not sell the requested representative products, they were requested to provide the selling price data and description for a representative product that they produced that was most similar in product features and uses as that specified. Price trends discussed in this section of the report were based on indexes of the reported f.o.b. prices, and price comparisons were based on the reported delivered prices. 1/

Trends in the reported prices of U.S.-produced cast-iron heavy construction castings, pipe fittings, and brake drums and rotors were mixed. Reported prices of the U.S.-produced light construction castings, however, generally fell during the periods reported, while reported prices of U.S.-produced compressor housings generally increased. Trends in reported prices of the imported products were similar to trends of prices of the U.S.-produced products.

Construction castings.—The Commission requested U.S. producers and importers to report the net selling price data for sales of one representative heavy construction casting product sold to their largest distributor and largest contractor customers and one representative light construction casting product sold to their largest distributor customer, by quarters, during January 1981–December 1985. Single largest sales data to these customers were requested for each of the quarters to increase the chances of obtaining delivered prices, as well as f.o.b. prices. The two representative products are described below:

PRODUCT 1: Two-piece manhole assembly (cover and frame) of cast iron, machined, approximately 300 pounds total. Cover approximately 23 inches in diameter; 7/8 to 1-3/8 inches thick. Frame base height approximately 6 inches; clear opening approximately 22 inches; base diameter approximately 32 inches.

PRODUCT 2: Two-piece adjustable cast-iron valve box (bottom section, and top section with lid), screw or sliding type, total weight approximately 60 pounds. Top section 10-1/2 inches in length; cover: drop lid type, 7-1/4 inches approximate diameter, 3-1/4 inches in height; top section and cover weight approximately 35 pounds. Bottom section: shaft inside diameter 5-1/4 inches, outside diameter 5-3/4 inches; base 10-1/4 inches; weight of bottom section approximately 25 pounds.

Indexes of the reported U.S.-producer and importer f.o.b. (U.S. locations) prices of products 1 and 2 are shown in table I-34 and the weighted-average f.o.b. prices and quantities are shown in appendix tables F-1 through F-4. Where price comparisons were possible, the weighted-average

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1/ Unless stated otherwise, weighted-average prices were calculated from the reported net f.o.b. and delivered selling price data. Because the weighted-average prices are based on the responses of a limited number of producers and importers, some of the quarter-to-quarter changes in the price series result from different respondents, or changes in the weighting of the responses, rather than from price changes.

Table I-34.—Construction castings: Indexes of net f.o.b. (U.S. locations) selling prices to distributors and contractors of U.S.-produced and imported products, by types of product and by quarters, January 1981-December 1985

Period	2-piece manhole assembly 1/				Sales of 2-piece to valve boxes 2/ to distributors	
	Sales to distributors		Sales to contractors			
	U.S.-produced	Imported	U.S.-produced	Imported	U.S.-produced 3/	Imported 3/
1981:						
Jan.-Mar	100.0	100.0	100.0	100.0	-	-
Apr.-June	102.1	100.0	100.0	99.5	-	-
July-Sept	99.8	100.0	100.0	99.5	-	-
Oct.-Dec	100.0	100.0	100.0	97.6	-	-
1982:						
Jan.-Mar	100.3	99.3	100.0	100.4	-	-
Apr.-June	102.4	99.3	100.0	97.6	100.0	100.0
July-Sept	102.8	99.3	100.0	99.8	109.1	108.1
Oct.-Dec	106.1	99.3	100.0	97.6	-	109.4
1983:						
Jan.-Mar	102.2	98.7	113.0	100.3	76.9	112.2
Apr.-June	100.4	95.7	108.6	92.7	96.6	104.1
July-Sept	97.3	95.7	117.2	91.1	87.7	106.9
Oct.-Dec	103.5	95.7	117.0	94.0	84.2	98.8
1984:						
Jan.-Mar	101.1	79.3	115.2	88.8	83.8	101.8
Apr.-June	104.0	79.3	122.2	89.9	76.5	100.2
July-Sept	100.3	79.3	122.3	88.8	86.7	99.7
Oct.-Dec	101.0	79.3	112.0	89.4	83.8	101.9
1985:						
Jan.-Mar	94.5	94.4	111.5	84.6	81.1	93.7
Apr.-June	105.9	94.4	117.7	84.0	81.0	94.0
July-Sept	94.4	94.4	121.1	85.8	78.6	92.8
Oct.-Dec	92.7	94.4	123.6	84.1	78.6	97.5

1/ Two-piece manhole assembly (cover and frame) of cast iron, machined, approximately 300 pounds total. Cover approximately 23 inches in diameter; 7/8 to 1-3/8 inches thick. Frame base height approximately 6 inches; clear opening approximately 22 inches; base diameter approximately 32 inches.

2/ Two-piece adjustable cast-iron valve box (bottom section, and top section with lid), screw or sliding type, total weight approximately 60 pounds. Top section 10-1/2 inches in length; cover: drop lid type, 7-1/4 inches approximate diameter, 3-1/4 inches in height; top section and cover weight approximately 35 pounds. Bottom section: shaft inside diameter 5-1/4 inches, outside diameter 5-3/4 inches; base 10-1/4 inches; weight of bottom section approximately 25 pounds.

3/ April-June 1982=100.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Note: January-March 1981=100 unless otherwise noted.

delivered prices of the U.S.-produced and imported products are shown in tables F-5 and F-6. In addition to price data for products 1 and 2, U.S. producers and importers reported quarterly or annual selling price data for several other representative heavy and light construction casting products subject to this investigation. 1/ These additional U.S.-produced and imported cast-iron construction casting products have various specifications and weights different from those of products 1 and 2. 2/ The latter price data provided some direct price comparisons between the U.S.-produced and imported heavy cast-iron construction casting products. Trends in the reported f.o.b. prices and the delivered price comparisons of these products are also discussed but not shown.

Heavy castings.—U.S. producers' and importers' reported quarterly net f.o.b. selling prices of product 1 sold to distributors and to contractors fluctuated but generally fell during January 1981-December 1985 (table I-34). The single exception was U.S. producers' generally rising prices of product 1 sold to contractors during this period. The price data reported by U.S. producers and importers for the heavy construction castings other than product 1 showed generally stable or increasing prices for sales to distributors and to contractors.

On sales to distributors, U.S. producers' and importers' f.o.b. selling prices of product 1 fell similarly, by approximately 7 and 6 percent, respectively, during January 1981-December 1985 (table I-34). During this period, however, U.S. producers' prices of product 1 fluctuated but were generally above the initial period value before falling during 1985, whereas the importers' prices were generally below the initial period value during much of the period. U.S. producers' reported quarterly selling prices of 425-pound, 400-pound, and 325-pound manhole assemblies sold to distributors, however, remained at or above their initial period values during January 1981-December 1985. During this period, the price of the 425-pound manhole assembly rose by about 34 percent, the price of the 400-pound product remained unchanged, and the price of the 325-pound product rose slightly by

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1/ The price data for products 1 and 2 and for the other representative products were reported by 18 U.S. producers and 14 U.S. importers. The responding U.S. producers accounted for about * * * percent of total 1985 U.S. production of all the subject cast-iron construction castings; the responding importers accounted for approximately * * * percent of total imports of all such castings in 1985. The responding U.S. producers and importers did not necessarily respond for both types of customers, or all periods requested.

2/ Ten other heavy cast-iron construction casting products were reported by U.S. producers. Of these 10 products, 9 were manhole assemblies and 1 was an inlet frame and grate assembly. Seven of the nine manhole assembly products were sold to distributors and four were sold to contractors (some sizes were sold to both types of purchasers). The inlet frame and grate assemblies were sold to contractors. All reported prices of U.S.-produced light construction castings other than product 2 were for 80-pound valve box assemblies sold to distributors.

All six other heavy construction castings reported by U.S. importers were manhole assemblies. Four of these products were sold to distributors and three were sold to contractors (some sizes were sold to both types of purchasers). The single other light construction casting product reported by importers was a valve box assembly sold to distributors.

0.2 percent. 1/ Based on partial period data reported by importers, the quarterly selling price of an imported 280-pound manhole assembly sold to distributors increased by about 3 percent during July 1983-September 1985, and the price of an imported 350-pound manhole assembly sold to distributors increased by about 22 percent during January 1983-September 1985. 2/

On sales to contractors, U.S. producers' reported quarterly f.o.b. selling prices of product 1 sold to contractors rose by approximately 24 percent during January 1981-December 1985, and U.S. importers' reported prices fell by about 16 percent (table I-34). U.S. producers' reported quarterly selling prices of 312-pound, 475-pound, and 575-pound manhole assemblies sold to contractors remained at or above their initial period values during January 1981-December 1985. During this period, the price of the U.S.-produced 312-pound product rose by about 31 percent, that of the 475-pound product remained unchanged, and the price of the 575-pound manhole assembly rose by about 14 percent. 3/ * * * reported annual net f.o.b. prices for total sales of their 325-pound manhole assemblies sold to contractors in the * * * United States. During 1981-85, * * * selling prices of this product fell by approximately 22 percent. According to * * *, the firm's falling prices were triggered by * * *, 4/ but also by a lower price structure forced by low import prices (telephone conversation with Commission staff on Apr. 3, 1986). 5/ Importers' reported quarterly selling prices of a 350-pound manhole assembly sold to contractors increased by about 4 percent during October 1981-December 1985, the period reported. Importers' reported prices remained unchanged for two other manhole assembly products sold to contractors during the partial periods reported: prices of a 372-pound manhole assembly during October 1983-June 1985, and prices of a 400-pound manhole assembly during April 1984-December 1985.

1/ U.S. producers' reported quarterly f.o.b. selling prices of three other manhole assembly products sold to distributors generally increased during the partial periods reported. The selling price of a U.S.-produced 343-pound manhole assembly product increased by about 24 percent during January 1981-March 1985, the price of a U.S.-produced 312-pound manhole assembly increased by about 17 percent during January 1981-September 1985, and the price of a U.S.-produced 267-pound manhole assembly rose by about 12 percent during July 1982-June 1985. U.S. producers' reported quarterly selling prices of a 280-pound manhole assembly sold to distributors, however, fell by approximately 12 percent during the period reported, October 1981-December 1985.

2/ Importers' reported quarterly selling prices of two other manhole assembly products sold to distributors, however, remained unchanged or fell during the periods reported. The selling price of an imported 260-pound manhole assembly remained unchanged during January 1981-December 1985, whereas the selling price of an imported 360-pound manhole assembly fell by approximately 6 percent during October 1982-December 1985, the partial period reported.

3/ U.S. producers reported quarterly selling prices of two other heavy construction casting products sold to contractors, a 400-pound manhole assembly and a 650-pound inlet frame and grate assembly. Reported selling prices of the 400-pound manhole assembly remained unchanged during April 1981-June 1985, the partial period reported, but prices of the 650-pound frame and grate assembly fell by about 11 percent during January 1981-December 1985.

4/ * * *.

5/ In its questionnaire response, * * * reported that its 1985 average net price of $*** per assembly for the 325-pound manhole assembly would have to have been * * * percent greater to earn a reasonable return.

The reported net delivered selling price data resulted in 20 quarterly price comparisons between the U.S.-produced and imported product 1 sold to contractors and 20 price comparisons of this product sold to distributors during January 1981-December 1985 (table F-5). Imports were priced less than the U.S.-produced product to a greater degree in sales to contractors than in sales to distributors. In sales to contractors, the imported manhole assembly was priced less than the U.S.-produced product in 12 of the 20 comparisons by an average of 14 percent, or $11.06 per assembly. On the other hand, the imported manhole assembly sold to distributors was priced less than the U.S.-produced product in 8 of the 20 price comparisons by an average of 11 percent, or $8.42 per assembly. Reported delivered selling prices of the 280-pound manhole assembly resulted in five quarterly price comparisons between the U.S.-produced and imported products sold to contractors during July 1983-September 1985, the period reported. In all five comparisons, prices of the imported product were somewhat less than the U.S.-produced product, averaging 2 percent less, or $1.77 per manhole assembly.

The questionnaire requested U.S. producers of the heavy cast-iron construction products to report how much of an increase, if any, in their reported 1985 prices would have enabled them to earn a reasonable return on the reported sales. Ten U.S. producers reporting quarterly prices responded to this section of the questionnaire. Four of these U.S. producers, which reported prices of product 1, and the six other responding U.S. producers, which reported prices of other heavy cast-iron construction castings, reported that an average increase of approximately 20 percent of their reported 1985 prices would be necessary for them to earn a reasonable return.

<u>Light castings</u>.—Based on quarterly prices reported only for April 1982-December 1985, U.S. producers' net f.o.b. selling prices of product 2 sold to distributors fluctuated but fell by approximately 21 percent during this period (table I-34). * * *, a U.S. producer of the subject light construction castings in * * *, reported annual net f.o.b. prices for total sales of their 60-pound valve boxes to distributors in the * * * United States. During 1981-85, * * *'s reported selling price fell by approximately * * * percent. 1/ Price data reported by importers show that the f.o.b. prices (U.S. locations) of the imported product 2 sold to distributors fluctuated but fell by approximately 2 percent during April 1982-December 1985, the period reported (table I-33). The price data reported by U.S. producers and importers of the light construction castings other than product 2 also showed generally falling prices on sales to distributors. Three U.S. producers also reported quarterly net f.o.b. selling price data for an 80-pound cast-iron valve box sold to distributors during January 1981-December 1985. During this period the U.S. producers' weighted-average prices fell by approximately 13 percent. An importer's reported quarterly selling price of a 100-pound cast-iron valve box sold to distributors decreased by about 17 percent during January 1983-December 1985, the period reported.

The reported net delivered selling price data resulted in 14 quarterly price comparisons between the U.S.-produced and imported product 2 sold to distributors during April 1982-December 1985 (table F-6). Imports were

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1/ According to * * *, imports have captured much of the U.S. market for this high volume item, and much of the current price competition is between import suppliers (telephone conversation with the Commission staff on Feb. 18, 1986).

consistently priced less than the U.S.-produced product by an average of approximately 23 percent, or $4.26 per valve box.

The questionnaire requested U.S. producers of the subject light construction castings to report how much of an increase, if any, in their reported 1985 prices would have enabled them to earn a reasonable return on the reported sales. * * *, a producer in * * *, and * * * were the only two U.S. producers of the light construction castings that responded to this section of the questionnaire. * * * reported that its quarterly prices in 1985 would have to have been 15 percent greater to earn the company a reasonable return. Such an increase would be somewhat more than the * * *-percent decrease in his reported selling prices during January 1981-December 1985. * * * reported that its average net price of $*** per assembly in 1985 for the 60-pound valve box would have to have been about 45 percent greater to earn a reasonable return. This latter increase would be significantly greater than the 14-percent decline in * * *'s reported annual prices during 1981-85.

Pipe fittings.--The Commission requested U.S. producers and importers to report the selling price data for sales of one representative cast-iron pipe fitting product sold to their largest distributor and to largest contractor customers, by quarters, during January 1981-December 1985. Single largest sales data to these customers were requested for each of the quarters to increase the chances of obtaining delivered prices, as well as f.o.b. prices. The representative product is described below:

PRODUCT 3: Cast-iron pipe fitting, 8 inches in diameter, 45° bend, mechanical joint, gray iron, class 250 (water working pressure), with complete accessories.

Indexes of the reported U.S.-producer and importer f.o.b. (U.S. locations) prices of product 3 are shown in table I-35, and the weighted-average f.o.b. prices and quantities are shown in tables F-7 and F-8. Where price comparisons were possible, the weighted-average delivered prices of the U.S.-produced and imported product 3 are shown in table F-9. In addition to product 3, one U.S. producer reported quarterly selling price data for three additional representative cast-iron pipe fitting products, and an importer also reported price data for one of these latter products. 1/ Two of the additional domestic cast-iron pipe fitting products have various specifications and weights different from those of product 3, whereas the additional product reported by both the U.S. producer and importer was a compact ductile-iron pipe fitting substitutable for product 3. 2/ These latter price data provided some direct price comparisons between the

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1/ The price data for product 3 and for the other representative products were reported by six U.S. producers and two U.S. importers. The responding U.S. producers accounted for about * * * percent of total 1985 domestic production of all the subject cast-iron pipe fittings; the responding importers accounted for approximately * * * percent of total imports of all such castings in 1985. The responding U.S. producers and importers did not necessarily respond for both types of customers, or all periods requested.

2/ Two of the three pipe fitting products were gray-iron and ductile-iron Tees with different dimensions.

Table I-35.--Pipe fittings: Indexes of net U.S. f.o.b. (U.S. locations) selling prices to distributors and contractors of U.S.-produced and imported products, 1/ by quarters, January 1981-December 1985

Period	Sales to distributors of-- U.S.-produced pipe fittings	Sales to distributors of-- Imported pipe fittings	Sales to contractors of U.S.-produced pipe fittings
1981:			
January-March	100.0	100.0	100.0
April-June	100.0	100.0	102.2
July-September	100.0	100.0	122.7
October-December	100.0	100.0	97.2
1982:			
January-March	112.6	98.7	99.8
April-June	112.7	98.7	119.1
July-September	112.6	98.7	102.8
October-December	112.6	98.7	100.3
1983:			
January-March	111.9	97.4	92.7
April-June	111.9	97.4	92.7
July-September	112.0	97.4	107.4
October-December	112.1	97.4	98.6
1984:			
January-March	111.6	98.7	107.0
April-June	111.6	98.7	129.3
July-September	111.6	98.7	94.5
October-December	113.1	98.7	100.6
1985:			
January-March	112.5	96.1	103.4
April-June	112.4	96.1	170.6
July-September	112.5	96.1	110.7
October-December	112.6	96.1	105.2

1/ Cast-iron pipe fitting, 8 inches in diameter, 45° bend, mechanical joint, gray iron, class 250 (water working pressure), with complete accessories.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Note: January-March 1981=100

U.S.-produced and imported light cast-iron construction casting products. Trends in the reported f.o.b. prices and the delivered price comparisons of these other products are also discussed but not shown.

U.S. producers' quarterly net f.o.b. selling prices of product 3 sold to distributors and to contractors fluctuated but increased by approximately 13 and 5 percent, respectively, during January 1981-December 1985 (table I-35). The price data reported by the single responding importer show that the f.o.b. price (U.S. locations) of the imported product 3 sold to distributors fluctuated but fell by approximately 4 percent during January 1981-December 1985 (table I-35). The net f.o.b. selling price data reported for sales by

U.S. producers of the three pipe fitting products other than product 3 showed generally falling prices on sales to distributors. The reported U.S. producer price of an 8 X 6-inch gray-iron Tee sold to distributors fell by approximately 8 percent during January 1981-December 1985, and the price of a U.S.-produced 6-inch ductile-iron Tee sold to distributors fell by about 16 percent during the period reported, April 1983-December 1985. The reported price of the U.S.-produced compact ductile-iron pipe fitting with a 45° bend fell by about 17 percent during the period reported, April 1983-December 1985. Reported prices of this latter imported product sold to distributors remained unchanged during the period reported, January-December 1985, and the competing price of the U.S.-produced product fell by about 9 percent.

Recent prices of the gray-iron and compact ductile-iron pipe fittings reflect substitution of the ductile-iron products for the gray-iron pipe fittings. U.S. production of ductile-iron pipe fittings has increased rapidly since January 1984, when the American Water Works Association approved compact ductile pipe fitting specifications. Reported delivered quarterly selling prices of the U.S.-produced compact ductile-iron pipe fittings averaged approximately 15 percent, or about $11 per fitting, less than the reported delivered prices of the competing U.S.-produced gray-iron pipe fittings during the comparable periods reported, April 1983-December 1985.

The reported net delivered selling price data resulted in 20 quarterly price comparisons between U.S.-produced and imported product 3 sold to distributors during January 1981-December 1985 (table F-9). The reported delivered prices of the imported pipe fittings did not contain any accessories as requested. 1/ The U.S.-produced pipe fittings, which included these accessories (about 15 pounds), were consistently priced less than the imported product by about * * * percent, or $*** per pipe fitting. Reported delivered selling prices of the compact ductile-iron pipe fitting with the 45° bend resulted in four quarterly price comparisons during 1985 between the U.S.-produced and imported products sold to distributors. During January-September 1985, imports were priced less than the U.S. product by an average of approximately * * * percent, or $*** per fitting. But during October-December 1985, the U.S.-produced pipe fitting was priced about * * * percent less than the imported fitting, as the U.S. product reduced in price and the price of the imported product remained unchanged.

The questionnaire requested U.S. producers of the subject cast-iron pipe fitting products to report how much of an increase, if any, in their reported 1985 prices would have enabled them to earn a reasonable return on the reported sales. The single responding U.S. producer, * * *, reported this information for product 3 sold to distributors. * * * reported that an average increase of 20 percent in its reported 1985 prices would be necessary for it to earn a reasonable return.

<u>Compressor housings</u>.--The Commission requested U.S. producers and importers to report the selling price data for sales of two representative cast-iron compressor housing products sold to their largest customer, by quarters, during January 1981-December 1985. Single largest sales data to these customers were requested for each of these quarters to increase the

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1/ Without accessories the imported pipe fittings are not exactly comparable to the U.S.-produced product that included the accessories. As a result, reported prices of the imported products are biased downward vis-a-vis prices of the U.S.-produced products.

chances of obtaining delivered prices, as well as f.o.b. prices. The two representative products are described below:

PRODUCT 4: Cast-iron compressor housing casting as used in 1 horsepower hermetic-type motor compressors, not for use in automotive air-conditioning and using a refrigerant other than ammonia.

PRODUCT 5: Cast-iron compressor housing for a 40-ton reciprocating compressor.

Indexes of the reported U.S.-producer and importer f.o.b. (U.S. locations) prices of products 4 and 5 are shown in tables I-36 and I-37, and the f.o.b. prices and quantities for each of the reported compressor housing products are shown in tables F-10 through F-12. 1/ Because cast-iron compressor housings vary significantly in size and complexity, the reported price data is presented on an individual product basis. Where price comparisons of compressor housings in product category 4 were possible, the reported weighted-average delivered prices of the U.S.-produced and imported products 4 are shown in table F-13. Only U.S. producers reported price data for compressor housings in the product category 5. In addition to the requested product categories 4 and 5, a single U.S. producer reported quarterly net f.o.b. selling prices of one other representative compressor housing product. 2/ Trends in prices of this latter product are also discussed but not shown.

U.S. producers' and importers' quarterly net f.o.b. (U.S. locations) selling prices of compressor housings in product categories 4 and 5 generally increased or remained unchanged during the periods reported (tables I-36 and 37). In product category 4, prices of the domestic 3-pound, 5.3-pound, and 15-pound compressor housings increased, the price of the 8.5-pound compressor housing remained unchanged, and prices of the U.S.-produced 8.5-pound, 6.6-pound, and 19-pound compressor housings decreased during the periods reported (table I-36). The reported U.S. producer price of the 3-pound compressor housing increased by * * * percent during the period reported, January 1981-September 1985. Prices of the U.S.-produced 5.3-pound and 15-pound compressor housings increased by about * * * and * * * percent, respectively, during January 1981-December 1985, and the U.S. producer price of the 8.5-pound compressor housing * * * during the period reported, January 1981-September 1984. Based on reported partial period price data, the price of the U.S.-produced 6.6-pound compressor housing decreased by approximately * * * percent during July 1984-December 1985, and the price of the U.S.-produced 19-pound compressor housing fell by about * * * percent during October 1982-December 1985. 3/ The reported price of the imported 5.5-pound

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1/ These data were reported by nine U.S. producers and one U.S. importer. The responding U.S. producers accounted for about * * * percent of total 1985 U.S. production of all the subject cast-iron compressor housings; the responding importer accounted for approximately * * * percent of total imports of all such castings in 1985. The responding U.S. producers and the single responding importer did not necessarily respond for all periods requested.

2/ These latter price data were reported by a single U.S. producer, * * *, for a compressor housing (about 20 pounds) for a two cylinder heavy duty truck air compressor.

3/ U.S. producers' selling prices of the 20-pound compressor housing for a heavy-duty truck air compressor, however, increased by approximately * * * percent during January 1981-December 1985.

Table I-36.—Compressor housings for 1-horsepower motors: 1/ Indexes of net U.S. f.o.b. (U.S. locations) selling prices of U.S.-produced and imported products, by quarters, January 1981–December 1985

Period	U.S.-produced			
	3-pound compressor housing 2/	5.3-pound compressor housing 3/	6.6-pound compressor housing 4/	8.5-pound compressor housing 5/
1981:				
Jan.-Mar	100.0	100.0	-	100.0
Apr.-June	***	***	-	***
July-Sept	***	***	-	***
Oct.-Dec	***	***	-	***
1982:				
Jan.-Mar	***	***	-	***
Apr.-June	***	***	-	***
July-Sept	***	***	-	***
Oct.-Dec	***	***	-	-
1983:				
Jan.-Mar	***	***	-	-
Apr.-June	***	***	-	***
July-Sept	***	***	-	***
Oct.-Dec	***	***	-	***
1984:				
Jan.-Mar	***	***	-	***
Apr.-June	***	***	-	***
July-Sept	-	***	100.0	***
Oct.-Dec	***	***	***	-
1985:				
Jan.-Mar	***	***	***	-
Apr.-June	***	***	***	-
July-Sept	***	***	***	-
Oct.-Dec	-	***	***	-

See footnotes at the end of the table.

Table I-36.—Compressor housings for 1-horsepower motors: 1/ Indexes of net U.S. f.o.b. (U.S. locations) selling prices of U.S.-produced and imported products, by quarters, January 1981-December 1985—Continued

Period	U.S.-produced		Imported 5.5-pound compressor housing 8/
	15-pound compressor housing 6/	19-pound compressor housing 7/	
1981:			
Jan.-Mar	-	-	-
Apr.-June	100.0	-	-
July-Sept	***	-	-
Oct.-Dec	***	-	-
1982:			
Jan.-Mar	***	-	-
Apr.-June	***	-	-
July-Sept	***	-	-
Oct.-Dec	-	100.0	-
1983:			
Jan.-Mar	***	***	-
Apr.-June	***	***	100.0
July-Sept	***	***	-
Oct.-Dec	***	***	***
1984:			
Jan.-Mar	***	***	***
Apr.-June	***	***	***
July-Sept	***	***	***
Oct.-Dec	***	***	***
1985:			
Jan.-Mar	***	***	***
Apr.-June	***	***	***
July-Sept	***	***	***
Oct.-Dec	***	***	***

1/ Cast-iron compressor housing casting as used in 1 horsepower hermetic-type motor compressors, not for use in automotive air-conditioning and using a refrigerant other than ammonia.
2/ Based on selling prices reported by * * *.
3/ Based on selling prices reported by * * *.
4/ Based on selling prices reported by * * *.
5/ Based on selling prices reported by * * *.
6/ Based on selling prices reported by * * *.
7/ Based on selling prices reported by * * *.
8/ Based on the c.i.f. duty-paid, landed cost reported by * * *, a U.S. importer of cast-iron compressor housings and a producer of compressors.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table I-37.--Compressor housings for 40-ton compressors: 1/ Indexes of net U.S. f.o.b. selling prices of U.S.-produced products, by quarters, January 1981-December 1985

Period	165-pound compressor housing 2/	200-pound compressor housing 3/	1,400-pound compressor housing 4/
1981:			
Jan.-Mar	-	100.0	100.0
Apr.-June	-	-	***
July-Sept	-	-	***
Oct.-Dec	-	-	***
1982:			
Jan.-Mar	-	***	***
Apr.-June	-	***	***
July-Sept	-	***	***
Oct.-Dec	-	***	***
1983:			
Jan.-Mar	-	***	***
Apr.-June	-	***	***
July-Sept	-	***	***
Oct.-Dec	100.0	***	***
1984:			
Jan.-Mar	***	***	***
Apr.-June	***	-	***
July-Sept	***	***	***
Oct.-Dec	***	***	***
1985:			
Jan.-Mar	-	***	***
Apr.-June	-	***	***
July-Sept	-	***	***
Oct.-Dec	-	***	***

1/ Cast-iron compressor housing casting as used in 40-ton reciprocating compressors.
2/ Based on selling prices reported by * * *.
3/ Based on selling prices reported by * * *.
4/ Based on selling prices reported by * * *.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

compressor housing increased by about * * * percent during April 1983-December 1985 (table I-36).

In product category 5, U.S. producers' reported prices of the 165-pound, 200-pound, and 1,400-pound compressor housings increased during the periods reported (table I-37). The price of the U.S.-produced 165-pound compressor housing increased by about * * * percent during the partial period reported, October 1983-December 1984. Prices of the U.S.-produced 200-pound and 1,400-pound compressor housings increased by approximately * * * and * * * percent, respectively, during January 1981-December 1985. Importers did not report any price data for compressor housings in this product category.

The reported net delivered selling price data resulted in 10 quarterly price comparisons between the U.S.-produced and imported compressor housings in product category 4 (table F-13). The U.S.-produced compressor housing weighed about 5.3 pounds per unit and the imported compressor housing weighed about 5.5 pounds per unit. Imports were consistently priced less than the U.S. product by an average of about * * * percent, or $*** per compressor housing.

The questionnaire requested U.S. producers of the subject cast-iron compressor housings to report how much of an increase, if any, in their reported 1985 prices would have enabled them to earn a reasonable return on the reported sales. The three responding U.S. producers reported that their 1985 prices would have to have been 17 percent greater on average to earn them a reasonable return.

Compressor housings have unique specifications from order to order and generally are sold on a competitive-bid-price basis. To get the most meaningful price comparisons between U.S.-produced and imported compressor housings, the Commission sent purchaser questionnaires to U.S. purchasers of compressor housings requesting that they report competing prices on an individual-bid basis for their largest purchase of compressor housings involving competing U.S.-produced and imported products, by years, 1984-85. 1/ Three U.S. producers of compressors reported some price data on an individual-bid-price basis, three other firms reported using only U.S.-produced compressor housings, and one other firm reported using both U.S.-produced and imported compressor housings but did not report any price data. 2/ Imported compressor housings accounted for 1 percent, by weight, of the seven firms' total requirements of compressor housings during 1984-85. One U.S. producer of compressors, * * *, reported purchases of imported compressor housings from * * * and * * * during 1984 and 1985, ranging in price from 25 to 52 percent less than the lowest priced U.S.-produced compressor housings bid on the various contracts. * * *, another responding U.S. producer, reported purchasing compressor housings from * * * during 1985 that were priced about 21 percent less than the lowest priced competing U.S.-produced housing. In contrast, * * *, a third responding U.S. compressor producer, reported that the firm purchased U.S.-produced compressor housings in 1984 that were priced about 33 percent lower than the lowest priced competing foreign product.

<u>Brake drums and rotors</u>.—The Commission requested U.S. producers and importers to report selling price data for sales of one representative cast-iron brake drum product sold to their largest machine shop customer for sales to the original-equipment (OE) market and the largest machine shop customer for sales to the aftermarket (replacement market), by quarters,

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1/ These questionnaires were sent to the largest U.S. manufacturers of compressors, which account for most of the purchases of compressor housings.

2/ Two of the latter four responding U.S. producers of compressors purchased only U.S.-produced compressor housings during 1984-85, another firm produced domestically all its own compressor housing requirements, and the fourth firm that used both U.S.-produced and imported compressor housings did not receive any new price quotes during 1984-85. These four compressor manufacturers and the three producers reporting some price information accounted for about * * * percent of U.S. apparent consumption of compressor housings during 1984-85.

during January 1981–December 1985. 1/ Single largest sales data to these customers were requested for each of these quarters to increase the chances of obtaining delivered prices, as well as f.o.b. prices. The representative product is described below:

PRODUCT 6: Cast-iron 9-inch brake drum casting, gray iron, steel back plate, for intermediate-size automobiles.

Indexes of the reported U.S.-producer and importer f.o.b. (U.S. locations) prices of product 6 are shown in table I-38 and the weighted-average f.o.b. prices and quantities are shown in tables F-14 and F-15. Where price comparisons were possible, the weighted-average delivered prices of the U.S.-produced and imported product 6 are shown in table F-16. In addition to product 6, U.S. producers reported the requested price data for three additional representative cast-iron brake drum and rotor products. 2/ Although this latter price data did not provide any price comparisons between the U.S.-produced and imported products, trends in the reported f.o.b. prices are also discussed but not shown. 3/

U.S. producers' reported quarterly net f.o.b. selling prices of product 6 sold to the OE market were generally below their initial period value during January 1981–December 1985, but rose towards the end of the period to end 0.2 percent above the initial period value (table I-38). The reported price of U.S.-produced 44-pound truck brake drums sold to the OE market, however, fell by approximately 30 percent during this period. No prices for sales to the OE market were reported by importers of the subject cast-iron brake drums and rotors.

1/ Selling prices to the aftermarket are generally higher than to the OE market. The price premium in the aftermarket is due in part to higher unit production costs associated with lower production volumes in the aftermarket compared with the OE market, but also partly to pricing strategies of U.S. foundries producing brake drums and rotors for both markets. To get the high volume business of the very competitive OE market, U.S. foundries may price their brake drums and rotors to the OE market at very low levels, and offset these low prices with much higher prices to the aftermarket. Such a pricing strategy could make these suppliers vulnerable to low price competition from those imports of the subject brake drums and rotors serving primarily the lucrative aftermarket. (Commission staff telephone conversation of Jan. 19, 1986, with * * *, an importer of brake drums and rotors located in * * *.)

2/ The price data for product 6 and for the other representative products were reported by six U.S. producers and one U.S. importer. The responding U.S. producers accounted for about * * * percent of total 1985 U.S. production of all the subject cast-iron brake drums and rotors; the responding importer accounted for approximately * * * percent of total imports of all such castings in 1985. The responding U.S. producers and the single responding importer did not necessarily respond for sales to both markets, or all periods requested.

3/ Of the three other cast-iron brake drum and rotor products reported by U.S. producers, one was sold to the OE market and two were sold to the aftermarket. The product sold to the OE market was a 16-inch X 3-inch truck drum (about 44 pounds per unit). Of the two products sold to the aftermarket, one was a 24 pound hub and rotor assembly and the other was a 9.5-inch rotor (about 21 pounds per unit).

Table I-38.—Brake drums and rotors: Indexes of net U.S. f.o.b. selling prices of U.S.-produced and imported product, 1/ by markets served and by quarters, January 1981-December 1985

Period	Sales of U.S.-produced product to the OE market 2/	Sales to the aftermarket (replacement market) of— U.S.-produced product	Sales to the aftermarket (replacement market) of— Imported product
1981:			
January-March	100.0	100.0	100.0
April-June	90.8	100.0	***
July-September	100.2	100.0	***
October-December	98.3	100.0	***
1982:			
January-March	99.1	100.0	***
April-June	101.2	100.0	***
July-September	99.1	100.0	***
October-December	94.6	101.3	***
1983:			
January-March	99.8	101.3	***
April-June	97.9	101.3	***
July-September	96.0	101.3	***
October-December	95.3	101.3	***
1984:			
January-March	96.0	101.3	***
April-June	94.8	101.3	***
July-September	95.0	101.3	***
October-December	90.8	103.6	***
1985:			
January-March	95.7	103.6	***
April-June	93.6	103.6	***
July-September	100.5	103.6	***
October-December	100.2	96.4	***

1/ Cast-iron 9-inch brake drum casting, gray iron, steel back plate, for intermediate-size automobiles.
2/ Original-equipment (OE) market.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Note: January-March 1981=100

The U.S. producers' reported quarterly net f.o.b selling price of product 6 sold to the replacement market generally increased during January 1981-September 1985 before declining in October-December 1985 to end the period approximately 4 percent below the initial period value (table I-38). In comparison, the single responding importer's net f.o.b selling price of product 6 sold to the replacement market generally fell by about * * * percent during January 1981-December 1985 (table I-38). Two other U.S.-produced brake rotors sold to the replacement market showed mixed trends. The price of the U.S.-produced 9.5-inch rotor (21 pounds per unit) fell by approximately 20 percent during January 1981-December 1985. Based only on reported partial period data, the price of the U.S.-produced hub-and-rotor assembly (24 pounds per unit) rose by about 8 percent during January 1981-June 1982.

The reported net delivered selling price data resulted in 20 quarterly price comparisons between the U.S.-produced and imported brake drum (product 6) sold to the replacement market (table F-16). 1/ Imports were consistently priced less than the U.S.-produced product by an average of 8 percent, or $0.03 per pound of brake drum.

The questionnaire requested U.S. producers of the subject cast-iron brake drums and rotors to report how much of an increase, if any, in their reported 1985 prices would have enabled them to earn a reasonable return on the reported sales. The three responding U.S. producers to this section of the questionnaire that reported prices of product 6 reported that an average increase of 14 percent in their reported 1985 prices would be necessary for them to earn a reasonable return. One other responding U.S. producer, which reported prices of the 9.5-inch rotor (21 pounds per unit) sold to the aftermarket, reported that an increase of approximately 23 percent in its reported 1985 prices would be sufficient. This latter increase was slightly greater than the 20-percent decline in prices reported by this producer.

Transportation factors

U.S. producers and importers of the subject iron casting products were also requested to report information in the questionnaire on the extent of their marketing areas in the United States and on U.S. inland transportation costs to deliver these products to their customers. The reporting U.S. producers and importers generally ship the subject cast-iron products by truck in the U.S. market and absorb at least some of the freight costs to their customers. Although U.S. producers reported selling their cast-iron products in a larger market area than that reported by the importers, producers and importers reported similar delivery costs to their customers. 2/ Responses by U.S. producers and importers to this section of the questionnaire are discussed in detail below by the four subject cast-iron product categories: construction castings, pipe fittings for water-main pressure pipe, compressor housings, and brake drums and rotors.

Construction castings.—Responding U.S. producers of cast-iron construction castings reported that their major sales areas averaged approximately 500 miles from their foundries, whereas the responding importers' major sales areas averaged about 260 miles from their U.S. selling locations. The largest customers of responding U.S. producers averaged about 200 miles from their foundries, but the largest customers of U.S. importers averaged about 120 miles from their U.S. selling locations. U.S. producers and importers, however, reported similar average delivery costs to their largest customers of about 4.5 percent of the delivered prices. Both U.S. producers and importers generally reported absorbing more than one-half of the U.S. inland freight on more than 50 percent of their total annual sales of the subject cast-iron construction castings.

1/ Delivered price comparisons between the U.S.-produced and imported 9-inch brake drum were made on a cents-per-pound basis because of the significantly different weights of the reported brake drums, about 19 pounds per drum for the U.S.-produced product and 13 pounds per drum for the imported product.

2/ Lower shipping costs could be expected from importers that sell in a more limited market range than U.S. producers. Fewer responses to the question about delivery costs than to the question on the extent of the respondents' major selling markets may explain the response noted above.

Pipe fittings.—Responding U.S. producers of the cast-iron pipe fittings reported that their major sales areas averaged approximately 980 miles from their foundries, whereas the responding importers' major sales areas averaged about 900 miles from their U.S. selling locations. The largest customers of responding U.S. producers averaged about 625 miles from their foundries, but the largest customers of U.S. importers averaged about 300 miles from their U.S. selling locations. U.S. producers and importers reported average delivery costs to their largest customers of about 3 and 5 percent, respectively, of the delivered prices. U.S. producers generally reported absorbing more than one-half of the U.S. inland freight on more than 50 percent of their total annual sales of the subject cast-iron pipe fittings. On the other hand, importers reported absorbing between 10 and 50 percent of the U.S. inland freight on about one-half of their total annual sales of the subject pipe fittings.

Compressor housings.—Responding U.S. producers of cast-iron compressor housings reported that their major sales areas averaged approximately 560 miles from their foundries, but their largest customers were located an average of 380 miles from their foundries. U.S. producers reported that delivery costs to their largest customers averaged approximately 3 percent of the delivered prices. U.S. producers generally reported absorbing at least some of the U.S. inland freight to their customers. Importers of the subject cast-iron compressor housings did not report usable price data in this section of the questionnaire.

Brake drums and rotors.—Responding U.S. producers of cast-iron brake drums and rotors reported that their major sales areas averaged approximately 775 miles from their foundries, and their largest customers averaged about 640 miles from their foundries. U.S. producers reported that delivery costs to their largest customers averaged about 5 percent of the delivered prices. Only one U.S. producer, * * *, reported information on freight absorption, stating that the firm pays more than * * * percent of the freight costs to its customers on about * * * percent of its annual sales. U.S. importers did not report any usable information in this section of the questionnaire.

Possible Causes of Injury Other Than Imports

U.S. production of the subject cast-iron products first fell from 1981 to 1982 but then generally rose during 1982-85; imports of these products followed a similar trend. These similarities suggest that external influences affected both U.S. producers and importers. Some general factors affecting all the subject foundries are first discussed, followed by a more detailed analysis of each of the four cast-iron product categories.

Environmental and work-safety legislation beginning in the late 1970's has increased costs of U.S. producers of the subject iron casting products, 1/ while recessions during the early 1980's resulted in declines in production and profits of these producers. Although some U.S. foundries went out of business in the late 1970's and early 1980's because they could not afford to meet the initial EPA and OSHA requirements, many foundries made the necessary expenditures. Subsequent new guidelines have forced U.S. foundries to make

1/ EPA and the OSHA set and administer the Federal environmental and work-safety guidelines. Some States set additional standards.

additional expenditures. 1/ The amounts of expenditures for environmental and safety equipment are reported in the financial section of the report.

Recessions in the United States in 1980 and again in 1981-82 also caused decreased demand for the subject iron castings. Pages I-13 to I-15 detail the changes in demand during 1981-85 for each of the four cast-iron product categories. Compounding these problems of the U.S. foundries were increased energy costs in the late 1970's and early 1980's, and historically high interest rates in the early 1980's. Specific other possible causes of injury to the individual cast-iron product groups are discussed below.

Construction castings

Individual U.S. producers of the subject iron construction castings may have suffered injury from several other factors including domestic competition, failure to modernize, and new product demand. These factors are discussed below.

Domestic competition.—Of the approximately 40 U.S. foundries producing the subject iron construction castings, 10 accounted for about 85 percent of U.S. production in 1985. 2/ During 1981-85, many of these large U.S. foundries, producing primarily the heavier type of castings, invested in modern equipment. Some also complemented their domestic production with imports. These investments and imports by U.S. producers could be expected to result in lower selling prices, better margins, or both for the large producers. The few large producers were reportedly using lower costs resulting from their investments and imports to increase their market shares through aggressive pricing. 3/ Such tactics may have been detrimental to the numerous small foundries unable to make similar investments or to import. 4/

New product development.—Ductile-iron manhole assemblies for standard use, which weigh about one-half of the comparable gray-iron manhole assemblies, were introduced into the U.S. market in 1983 by French producers. Although not very numerous as yet, these products have displaced some U.S. production and may capture an increasing share of the gray-iron manhole assembly market in the future. 5/ Yet, according to questionnaire responses,

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1/ Furthermore, some foundries have had to pay more than others as some States, for example, California, have environmental and safety standards more restrictive than the Federal guidelines.

2/ On the basis of data submitted in response to questionnaires of the U.S. International Trade Commission during the present investigation, Certain Metal Castings, (Investigation No. TA-201-58).

3/ Prehearing brief of the Association of Castings Importers of America.

4/ Failure to modernize may also have affected these foundries' competitive position vis-a-vis imports. For example, Bibby Ste. Croix Foundry, a Canadian producer of the light construction castings, indicated at the hearing and in posthearing submissions that investments in new equipment have allowed them to reduce their costs by about 30 percent below costs of U.S. producers. New equipment includes automated permanent mold machines, centrifugal (spin) casting machines, and spring threading machinery.

5/ Prehearing brief of the French Foundry Producers' Association. This respondent supplied letters from its customers stating that the imported French ductile-iron manhole assemblies were preferred to the U.S. products, which did not offer features similar to the imported products.

U.S. producers apparently have not invested in equipment to produce these products, relying instead on investing in new equipment to reduce costs of producing the standard gray-iron products. 1/

Pipe fittings

The shift to compact ductile-iron pipe fittings and a significant drop in U.S. exports of pipe fittings are possible causes other than imports resulting in injury to the U.S. foundries producing the subject pipe fittings.

Shift to compact ductile-iron pipe fittings.—Although most U.S.-produced water main pressure pipes have been made with ductile iron for several years, until 1984 most of the U.S.-produced pipe fittings for these pipes had been made primarily with gray iron. Since January 30, 1984, however, when the American Water Works Association approved specifications for ductile water-main pressure pipe fittings, some U.S. foundries have begun producing the lighter compact ductile fittings. The shift in production has involved significant costs during 1984-85 that may have temporarily decreased profit margins of these firms during this period. Also, as more U.S. firms supply increasing amounts of the ductile-iron pipe fittings, the increased competition should cause prices of this new product to decline. 2/ The U.S. producers that produce the gray-iron pipe fittings but have not invested or are slow to invest in equipment to produce the compact ductile-iron fittings may have been hurt during 1984-85 by sales of substitutable U.S.-produced compact ductile-iron fittings. Although ductile-iron products are more expensive on a per pound basis, the greater strength of this material allows lighter castings, and therefore these products are less expensive on a per unit basis.

Decreased exports of the subject pipe fittings.—U.S. producers' exports of the subject pipe fittings, primarily to Mideast countries, declined significantly during 1981-85. Producers' exports of pipe fittings and total U.S. shipments are presented in the following tabulation:

Year	Producers' exports (tons)	Producers' shipments (tons)	Ratio of exports to shipments (percent)
1981	2,405	99,736	2.4
1982	3,579	93,168	3.8
1983	2,768	107,111	2.6
1984	2,124	120,729	1.8
1985	990	116,842	.8

Exports of pipe fittings initially increased by 49 percent in 1982, or from 2.4 to 3.8 percent, as a ratio to U.S. producers' total shipments within the United States. Since 1982, however, exports of pipe fittings have declined continuously, both in terms of tonnage and as a ratio to U.S. producers' total

1/ * * *. (Commission staff field trips of Mar. 9-15.) Imports from France are reported to be for standard use, however.

2/ The price section of this report shows generally falling prices of the U.S.-produced ductile-iron pipe fittings.

U.S. shipments. In 1985, producers' exports of pipe fittings were 59 percent below the 1981 export level and represented only 0.8 percent as a ratio to producers' U.S. shipments. This drop in U.S. producers' exports may have resulted partially from the effects of a strong U.S. dollar on the competitiveness in export markets of U.S. producers, and more recently from the downturn in oil prices and revenues earned by oil producing countries.

Compressor housings

The increase in imports of completed compressors and decreases in U.S. exports of these items are possible causes other than imports of compressor housings adversely affecting the U.S. foundries producing cast-iron compressor housings. During Commission staff field trips to * * *, which are both U.S. manufacturers of compressors and purchasers of compressor housings, officials indicated that import protection for U.S. producers of compressor housings would result in increased costs of compressor housings in the U.S. market and would further erode the compressor manufacturers' ability to compete in the U.S. and foreign markets that they serve. 1/

Increased imports of compressors.—Increased imports of compressors during 1981-85 reportedly hurt sales of U.S.-produced compressors during this period. 2/ As a result, imports of completed compressors have reduced the demand in the end-use markets for U.S.-produced compressor housings during this period. The real value of imports and apparent consumption are shown in the following tabulation (in millions of 1981 dollars): 3/

Year	Imports	Apparent consumption	Ratio of imports to consumption
1981	277.4	4,113.3	6.7
1982	264.6	3,887.7	6.8
1983	328.8	4,252.5	7.7
1984	544.2	4,748.3	11.5
1985	625.1	5,062.6	12.3

The real value of U.S. imports of completed compressors increased by approximately 125 percent during 1981-85, and the share of the compressor market accounted for by imports nearly doubled during this period. In addition to imports of compressors as separate items, these articles also may be entered as parts of imported refrigerators, air-conditioners, and motor vehicles. 4/

1/ Commission staff field trip during Jan. 26-30, 1986.
2/ Posthearing submission of the Brazilian Foundry Association, and the prehearing submission of Copeland Corp., a U.S. manufacturer of compressors and a purchaser of compressor housings.
3/ Compiled from official statistics of the Department of Commerce, with the assistance of private sector analysts in both trade associations and individual business firms.
4/ Imports of refrigerators, window air-conditioners, and motor vehicles increased continuously during 1981-85, by approximately 806,000 units (116 percent), 195,000 units (696 percent), and 2 million units (57 percent), respectively.

<u>Decreased exports of compressors</u>.—Because U.S. production of compressors for export results in demand for U.S.-produced compressor housings, a drop in U.S. exports of compressors would reduce demand for U.S.-produced compressor housings. The real value of U.S. compressor exports declined by approximately 44 percent during 1981-85. Such exports accounted for about 11 percent of total U.S. producers' shipments of compressors in 1985, compared with 21 percent in 1981. The real value of U.S. producers' shipments and exports are shown in the following tabulation (in millions of 1981 dollars): 1/

Year	Exports	Producers' shipments	Ratio of exports to to producers' shipments
1981	1,025.2	4,861.1	21.1
1982	848.2	4,471.3	19.0
1983	668.4	4,592.1	14.6
1984	564.3	4,768.4	11.8
1985	569.1	5,006.6	11.4

<u>Brake drums and rotors</u>

U.S. producers of the subject iron brake drum and rotor castings may have been adversely affected by several factors including increased imports of motor vehicles, downsizing and shifts to front-wheel drive by U.S. auto manufacturers, new product development, the automakers' purchasing power, and a soft market for heavy trucks and trailer chassis. These factors are discussed below.

<u>Increased imports of motor vehicles</u>.—The importation of one motor vehicle, or the assembly of one motor vehicle by a foreign automaker, e.g., Honda or Nissan, in the United States, for which foreign automakers do not use U.S.-produced brake drums and rotors, reduces potential demand for U.S.-produced brake drums and rotors by four units.

The following tabulation shows U.S. imports of all motor vehicles, foreign automakers' U.S. production of vehicles, and the potential number of brake drums and rotors not produced due to imports and foreign motor vehicle assembly in the United States (in units): 2/

Year	U.S. imports	Potential effect	U.S. production by foreign automakers	Potential effect
1981	3,589,317	14,357,268	168,000	672,000
1982	3,623,705	14,494,820	86,000	344,000
1983	3,945,036	15,780,144	153,000	612,000
1984	4,586,791	18,347,164	214,000	856,000
1985	5,621,856	22,487,424	348,000	1,392,000

1/ The real value is computed on the basis of official statistics of the U.S. Department of Commerce and information from the Air Conditioning and Refrigeration Institute, with the assistance of private sector analysts in both trade associations and individual business firms.

2/ Data compiled from official statistics of the U.S. Department of Commerce and the Motor Vehicle Manufacturers Association of the United States.

During 1981-85, imports of all motor vehicles increased by about 2 million units, or 57 percent, and foreign automakers' production of their motor vehicles in the United States increased by 180,000 units, or over 100 percent. 1/ Accordingly, the increase in imports of motor vehicles could have reduced the annual consumption of U.S.-produced brake drums and rotors by as much as 8 million units from 1981 to 1985. Similarly, the increase in U.S. production of foreign models during the period under investigation could have reduced the annual consumption of brake drums and rotors by as much as 720,000 units from 1981 to 1985. Although these effects are most important in the original-equipment (OE) market, it is likely that increasing vehicle imports would have additional effects on U.S. production of brake drums and rotors because replacement parts to foreign vehicles will often be obtained abroad. 2/

Increases in domestic production capacity for brake drums and rotors.—Downsizing and the conversion to front-wheel drive (FWD) automobiles by U.S. manufacturers have resulted in about a 50-percent decrease in the weight of cast-iron brake drums and rotors during 1975-85. 3/ In turn this reportedly has led to overcapacity in U.S. foundries producing the subject brake drums and rotors, tending to increase their costs. 4/

New product development.—Neelon Casting, a Canadian producer of the cast-iron brake drums and rotors, developed with General Motors a special squeak-reducing iron for brake drums and rotors, called damped iron. The technology to produce this type of iron is sophisticated and may be beyond the technical capabilities of many U.S. foundries. Wheland Foundry is reportedly the only known U.S. foundry to make the damped-iron brake drums and rotors. Currently, 30 to 40 percent of all U.S.-made automobiles reportedly use damped iron in their brake drums and rotors. 5/

Automakers' purchasing power.—The top three U.S. automakers, which account for the bulk of U.S. auto production, have traditionally insisted upon low prices from their suppliers. 6/ Because of increased competition with

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1/ Total imports and foreign automakers' production in the United States accounted for about 37 percent of apparent U.S. consumption of motor vehicles in 1985.

2/ Posthearing briefs of the Brazilian Foundry Association and Rockwell International Corp., a U.S. purchaser of brake drums and rotors. Also prehearing briefs of both the Taiwan Metals Industries Association and the Canadian Foundry Association.

3/ The conversion to front-wheel drive led to the development of a composite rotor that is significantly lighter in weight than rotors traditionally used on rear-wheel drive cars. Such conversion resulted in a weight reduction of the cast-iron brake drums and rotors in addition to weight reductions from general downsizing.

4/ Posthearing briefs of the Brazilian Foundry Association and Rockwell International Corp., a U.S. purchaser of brake drums and rotors. Also prehearing briefs of both the Taiwan Metals Industries Association and the Canadian Foundry Association.

5/ Hearing testimony of Peter Kenny, president of Neelon Casting, a Canadian producer of brake drums and rotors (official transcript of the proceedings, pp. 316-319).

6/ Many auto parts suppliers that serve both the OE market and the aftermarket reportedly subsidize their low prices in the OE market with higher prices in the aftermarket. The low prices in the OE market may reflect the buying power of the U.S. automakers, as well as cost economies of large production runs.

imported cars, however, U.S. automakers have reportedly requested their parts suppliers to reduce their costs by 20 to 30 percent during the next 5 years. 1/

Soft market for heavy trucks and trailers.—Several recent developments in this end-use market for heavy brake drums and rotors have possibly dampened demand for these products. 2/ Increased use of piggyback, intermodal containerization, and less aggressive brake linings have all reduced the wear and replacement of truck brake drums and rotors during 1981-85. Also, deregulation of interstate freight rates has forced many trucking companies to become more cost conscious in maintaining their equipment. All of these factors tended to limit U.S. demand for the heavy brake drums and rotors.

U.S. Producers' Efforts to Compete With Imports

Of the 62 U.S. producers of iron castings that provided usable data in response to the Commission's questionnaire, 48 listed measures that they have taken to compete more effectively in the U.S. market for iron castings. A summary of the total expenditures made to compete more effectively is presented in the following tabulation (in thousands of dollars):

Type of expenditure	1981	1982	1983	1984	1985
Investments	20,544	19,676	16,472	9,840	51,248
Cost reductions with existing equipment	***	***	1,989	3,235	2,536
Diversifications or expansions	***	241	758	3,069	***
Technological improvements	***	2,473	1,732	***	***
Organizational changes	***	***	***	***	***
Marketing changes	***	640	1,060	787	1,593
All other expenditures	1/	1/	***	1/	***
Total	26,935	25,703	22,169	18,007	60,033

1/ No dollar amounts of expenditures reported.

Over three-fourths of the expenditures reported were in the investment category, although, as several firms pointed out, these investments also represented technological improvements, product diversification, or plant expansion. The data presented above do not double count such expenditures, instead reporting them all in the investment category.

Eight firms reported investment expenditures of $4 million or more during 1981-85. These eight firms together accounted for $77.7 million, or 67 percent, of reported investment expenditures and $93.0 million, or 61 percent, of total reported expenditures. These eight firms are * * *.

* * *, a producer of * * *, reported the largest investments, or $***, during 1981-85. Of the investment expenditures, $*** and $*** were spent in * * * and * * *, respectively, for * * *.

1/ Prehearing and posthearing submissions of the Canadian Foundry Association.

2/ Questionnaire response of * * *, a U.S. importer of * * *.

* * *, mainly a producer of * * *, reported investment expenditures of $*** during 1981-85. The bulk of these expenditures were an investment of $*** in * * * for * * *.

* * *, mainly a producer of * * *, reported investment expenditures of $*** during 1981-85. These expenditures were investments of $*** and $***, in * * * and * * *, respectively, for * * *. * * *.

* * *, mainly a producer of * * *, reported an investment expenditure of $*** in * * * for * * *.

* * *, a producer of * * *, reported investments of $*** during 1981-85. Of the investment expenditures, $*** and $*** were spent in * * * and * * *, respectively, for * * *.

* * *, a producer of * * *, reported investments of $*** during 1981-85. Of the investment expenditures, * * *.

* * *, mainly a producer of * * *, reported investments of $*** during 1981-85. Of the investment expenditures, * * *.

* * *, a producer of * * *, reported investments of * * *.

U.S. Producers' Planned Adjustments if Relief Is Granted

In response to a question in the Commission's questionnaire on what adjustments responding firms would make if temporary relief under section 201 is granted (assuming relief of a 40-percentage point increase in tariffs for 5 years), 42 responding producers reported on plans to undertake certain adjustments and 20 producers either did not complete that section of the questionnaire or indicated that they had no plan to undertake specific adjustments. Of the 42 producers reporting plans to undertake adjustments, 39 provided estimates of the dollar expenditures involved and the remaining firms assigned no dollar amounts. Aggregate planned expenditures of the 42 producers that plan to undertake specific adjustments are presented in the following tabulation:

Type of expenditure	Anticipated expenditures (1,000 dollars)
Investments	105,095
Cost reductions with existing equipment	11,431
Diversifications or expansions	26,565
Technological improvements	7,060
Organizational changes	***
Marketing changes	5,015
All other expenditures	***
Total	161,071

Seven producers reported planned expenditures of over $10.0 million each. These firms are * * *. The largest anticipated expenditures include the purchase of more efficient molding equipment, conversion to ductile iron production capability, and product diversification.

CERTAIN STEEL CASTINGS

Introduction

This part of the report presents information relating to the steel castings subject to this investigation, as follows:

(1) Axle parts for off-highway heavy construction vehicles (axle parts);
(2) Levers for front-end loaders and crawler tractors (levers);
(3) Drive sprockets for track-laying construction machinery and track-laying tractors (drive sprockets);
(4) Beam hanger brackets for class 6, 7, and 8 on-highway trucks (beam hanger brackets);
(5) Sockets and suspension brackets for 5-ton military trucks (sockets and suspension brackets); and
(6) Parts of valves.

The Products

Description and uses

Each of the six types of steel castings subject to this investigation is described below. Also discussed below are the end uses of the subject castings and, in some cases, of the end products in which the castings are installed.

Axle parts.—Cast-steel axle parts range in weight from approximately 150 pounds to 5,000 pounds and are used in off-highway heavy construction vehicles. These castings include axle housings and spindles, which house the drive gears, and axles, which transmit the motive power to the wheels of the vehicle. In assembly, the axle housing is attached to the vehicle chassis with the rear wheels and internal gearing.

Levers.—Cast-steel levers for front-end loaders and crawler tractors range in weight from approximately 150 pounds to 2,500 pounds. The casting is a support arm that permits the manipulation (lifting) of the bucket or blade on a front-end loader or crawler tractor used in heavy construction. The lever operates as part of the linkage that controls the positioning of the bucket and blade. It is attached to the front of the vehicle and the back of the bucket.

Drive sprockets.—Cast-steel drive sprockets are contained within the supporting framework of crawler-mounted machinery such as tractors, cranes, excavators, bucket loaders, bulldozers, and other similar earth-moving and material-handling equipment. A sprocket is a toothed gear located at the rear of the undercarriage of a crawler. Each crawler has two sprockets (one per side) that receive power from the pinion shaft and transfer it to the track chain. As the sprocket rotates, its teeth engage the track chain and propel the crawler either forward or backward.

Beam hanger brackets.—Beam hanger brackets are cast-steel mechanisms that support the suspension system for class 6, 7, and 8 on-highway trucks 1/ by attaching the rear axle suspension springs to the truck chassis. There are 4 beam hanger brackets on a truck. The casting consists of a box channel frame base and two legs with holes drilled in both legs. In assembly, the base is welded to the frame of the truck with the two legs facing down. The legs are used to attach the suspension ends to the chassis of the truck. 2/ Industry sources indicate that beam hanger brackets are always custom made to individual purchasers' specifications. These brackets are almost always made from steel. Industry sources indicate that some users are experimenting with ductile-iron beam hanger brackets, but this substitution has been limited.

Sockets and suspension brackets.—Sockets and suspension brackets are cast-steel parts used in the suspension system of 5-ton military trucks. 3/ Sockets (also called trunion sockets) weigh approximately 30 pounds, and are butt welded 4/ on each end of the truck's front axle to support the front steering spindles. The suspension bracket weighs approximately 70 pounds and is bolted to the rear axle and center of the leaf springs on a military truck. 5/ Industry sources indicate that sockets and suspension brackets are custom made to military purchaser's specifications. These cast-steel parts were originally made in the 1950's and are now only used on military vehicles. There are no iron, plastic, or ceramic substitutes for sockets and suspension brackets; they are always cast from steel.

Parts of valves.—Steel valve castings are the cast component parts of steel valves. Steel valve castings are distinguished from completed valves. The principal type of steel valve casting is the cast-steel valve body (sometimes called the "shell") that holds other valve components together in the assembly. The valve body has ends adapted for connection to piping or tubing lines. In addition to the cast-steel valve bodies, steel valve castings include, but are not limited to, components such as (1) the bonnet (the upper part of the valve body assembly that guides the stem and contains the stem packing assembly); (2) the stem (the rod or spindle to which motion

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1/ According to the Motor Vehicle Manufacturers Association of the United States, Inc., class 6 on-highway trucks are defined as those whose gross vehicle weight is between 19,501 pounds and 26,000 pounds. The gross vehicle weight of class 7 trucks is 26,001 pounds to 33,000 pounds, and class 8 trucks exceed 33,000 pounds.

2/ This description of beam hanger brackets is taken from the petition in this investigation, p. 129.

3/ According to the U.S. Army Tank and Automotive Command, these trucks are used by all branches of the U.S. Armed Forces for cargo, ammunition, and personnel transportation.

4/ According to Manufacturing Processes, butt welding is the gripping together of two pieces of metal that have the same cross section, and pressing them together while heat is being generated on the contact surface by electrical resistance.

5/ This description of sockets and suspension brackets is taken from the petition in this investigation, p. 176.

is imparted outside the valve assembly to move the disc or wedge inside the valve); (3) the wedge (a flow-controlling element with inclined seating surfaces); (4) the handle (a device connected to the valve stem to permit manual operation); and (5) seat rings (a soft seat element which is usually an O-ring and is the contact surface of the seat). The steel valve castings that are the subject of this investigation consist of all steel castings for steel valves, including investment castings and including alloy steel and stainless steel castings.

Steel valve castings are used in the production or repair of completed cast-steel valves, including gate, globe, check, plug, ball, butterfly, and all other types of cast-steel valves. The valves are used primarily in piping systems in the petroleum refining, petrochemical, electric power generation, and pulp and paper manufacturing industries. Such valves vary in size from a fraction of an inch to more than 30 feet in diameter. They are used at pressures ranging from a vacuum to the highest pressures attainable today, and at temperatures from those of cryogenics to those of molten metal.

Manufacturing processes

Axle parts.--Axle parts are often produced by green sand molding, which was previously discussed in the introductory section of this report, but at least two producers use a process known as cold set or cold box molding. This method of casting involves bonding the sand with liquid sodium silicate, clay, and a type of organic material. The sand is then pressed into wooden boxes and a gas is injected into the core and mold to induce hardening. The mold halves are removed from the boxes once the sand is hardened. The cold set molding process helps to impart dimensional accuracy. The remainder of the production process is similar to that of other cast-steel construction equipment parts such as drive sprockets and levers, including lip pouring of the molten steel into the mold, cooling, shakeout, and finishing operations. The cold set method is very labor intensive compared with other processes such as green sand molding. This method of production is also more expensive than traditional molding techniques, increasing the cost of production by approximately $*** per ton; however, such costs may be recouped during the finishing process of the cast-steel product. 1/

Levers, drive sprockets, beam hanger brackets, and sockets and suspension brackets.--Green sand molding is the most frequent method used in steel foundries for the production of these products. After molding and cleaning, oxyacetylene torches or air arcs 2/ are used to remove risers, gates, and any surface defects. The castings then undergo heat treatment in a normalizing furnace to refine the grain structure within the metal, so that the casting will be more resistant to fracture. Some manufacturers will then shotblast

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1/ According to discussions with industry officials, January 1986.

2/ According to The Making, Shaping, and Treating of Steel, the air arc employs a copperclad electrode with which an arc is struck against the casting while a stream of compressed air directly behind the arc pushes away the slag created by the oxidation of the metal of the casting liquified by the heat of the arc.

the casting again after the heat treatment for a finer surface finish. After this process, the castings are subjected to any final finishing operation necessary, such as chipping and grinding. The castings are then inspected for structural flaws, and "gauged" or measured to make sure that they meet the purchaser's specifications. In the majority of U.S. foundries producing these steel castings, the finishing operations are performed manually by employees using hand grinders. The castings are not generally machined by the foundry; this work is done by the end users.

According to industry officials, the automation in the foundries producing these products can be termed "manually-assisted machines," i.e., employee-operated machines such as hoists and conveyors perform the majority of the casting operations. Certain processes, such as the placing of cores and the final finishing procedures, are still done manually. Officials at two large foundries producing these products note that several operations, including pouring and finishing, could be almost fully automated, if the volume of work warranted the investment.

Parts of valves.—Cast-steel parts of valves are produced by several types of casting processes, but primarily by the green sand process, the shell mold process, and the investment casting process. The green sand process is used for castings that weigh more than 100 pounds and is a process primarily suited for low-volume specialty castings. The shell mold process is used for castings that weigh 100 pounds or less and is primarily used for high-volume work. The investment casting process is also used for castings that weigh 100 pounds or less, but produces castings that are more precise than those produced by more traditional methods. 1/

The two types of melting equipment most commonly utilized in making steel valve castings are the electric and induction furnaces. A few large foundries also use argon oxygen decarburizing melting equipment for further refining of the steel.

Foundries producing steel valve castings are labor intensive. Although some automation is possible for the production of castings, much of the work to prepare the sand mold for the pour is done by hand. A pattern maker at the foundry makes a mold (usually out of wood) from drawings. The pattern is then pressed into a mold box with sand packed around it. Pouring molten steel into the mold, shaking out, and cleaning of the casting are relatively labor-intensive tasks.

1/ In the investment casting process, a wax or plastic pattern is formed and then dipped into a ceramic slurry that forms a hard shell around the pattern as it dries. The wax is then melted and the remaining empty shell is filled with molten metal, yielding a precise copy of the original pattern. The investment casting process has higher initial costs than the sand and shell molding processes, but also tends to reduce machining costs, reduce casting weights, and increase foundry tooling life.

Most foundries producing valve castings for commercial sale do not provide for finishing operations other than removal of gates, fins, risers, and sprues and for cleaning of the rough castings. Finishing operations, such as drilling bolt holes and machining surfaces, are performed by valve manufacturers that purchase the rough castings. Some foundries that produce parts of valves are owned by valve manufacturers.

U.S. tariff treatment

Axle parts.—Axle parts, including housings and spindles, for off-highway heavy construction vehicles are classified in TSUS item 664.08. TSUS item 664.08 includes construction and related machinery not specifically provided for elsewhere and parts of such machinery, as well as parts for machinery classified in items 664.06 and 664.07. Table II-1 indicates, for products entered under TSUS item 664.08 and selected other TSUS items, the column 1 rate of duty 1/ prior to the most recent (Tokyo) round of Multilateral Trade Negotiations (MTN), the column 1 rates of duty effective January 1, 1986, the final concession rates granted under the Tokyo Round of the MTN (which are also the rates of duty for LDDC's), 2/ and the column 2 rates of duty. Imports classified in TSUS item 664.08 are currently dutiable at a column 1 rate of 2.8 percent ad valorem, a column 2 rate of 35 percent ad valorem, and a LDDC rate of 2.5 percent ad valorem. Imports classified in TSUS item 664.08 are eligible for duty-free treatment under the Generalized System of Preferences (GSP), the Caribbean Basin Economic Recovery Act (CBERA), and the United States-Israel Free Trade Area Implementation Act of 1985.

Levers.—As is the case with the axle parts subject to this investigation, levers for front-end loaders and crawler tractors are classified under TSUS item 664.08.

Drive sprockets.—Drive sprockets for crawler tractors are classified in items 664.08, 692.34, and 692.35 of the TSUS. TSUS item 664.08 includes construction and related machinery not specifically provided for elsewhere and parts of such machinery, as well as parts for machinery classified in items 664.06 and 664.07. TSUS item 692.34 covers tractors suitable for agricultural

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1/ The col. 1 rates are applicable to imported products from all countries except those Communist countries and areas enumerated in general headnote 3(d) of the TSUSA. However, these rates would not apply to products of developing countries where such articles are eligible for preferential treatment provided under the Generalized System of Preferences (GSP) or under the "LDDC" column. Col. 1 rates are currently afforded to imports from Hungary, Romania, Yugoslavia, and the People's Republic of China.

2/ Final concession rates granted under the Tokyo Round of the MTN are the result of staged duty reductions of col. 1 rates becoming effective Jan. 1, 1987. LDDC rates are preferential rates (reflecting the full U.S. MTN concession rate for a particular item without staging) applicable to products of those LDDC's designated in general headnote 3(e) of the TSUSA which are not granted duty-free treatment under the GSP.

Table II-1.—Certain steel castings: U.S. rates of duty, by TSUS items

(Percent ad valorem)

TSUS item No. 1/	Description	Pre-MTN col. 1 rate of duty 2/	Col. 1 rates of duty effective with respect to articles entered on or after Jan. 1— 1986	1987	Col. 2 rate of duty
664.08 A,E,I	Other construction and mining machinery	5%	2.8%	2.5%	35%
680.17 A,E,I	Hand-operated and check taps, cocks, and valves, and parts, of iron or steel	11%	8.5%	8%	45%
680.25 A,E,I	Ballcock mechanisms and parts	5.5%	4.1%	3.9%	35%
680.27 A,E,I	Other taps, cocks, and valves, and parts thereof	4.8%	3.9%	3.7%	35%
692.32 A*,E,I	Certain motor-vehicle parts	4%	3.2%	3.1%	25%
692.34	Agricultural tractors and parts	Free	Free	Free	Free
692.35 A,E,I	Other tractors and parts	5.5%	2.6%	2.2%	27.5%

1/ The designation "A" or "A*" indicates that the item is currently designated as an article eligible for duty-free treatment under the Generalized System of Preferences (GSP). "A" indicates that all beneficiary developing countries are eligible for duty-free treatment. "A*" indicates that certain of these countries, specified in general headnote 3(e) of the Tariff Schedules of the United States Annotated, are not eligible. The symbol "E" indicates that the item is currently designated as an article eligible for duty-free treatment under the Caribbean Basin Economic Recovery Act (CBERA). The symbol "I" indicates that the the item is currently designated as an article eligible for duty-free treatment under the United States-Israel Free Trade Area Implementation Act of 1985.

2/ Rate effective prior to Jan. 1, 1980; pursuant to negotiations in the Tokyo Round of the MTN, staged reductions in the rates of duty are effective Jan. 1 of each year during 1980-87.

Source: U.S. International Trade Commission.

use and parts thereof. TSUS item 692.35 includes other tractors and their parts, not specifically provided for elsewhere. The rates of duty on imports classified in TSUS item 664.08 are discussed above in the section on axle parts. Imports classified in TSUS item 692.34 are free of duty. Imports classified in TSUS item 692.35 are currently dutiable at a column 1 rate of 2.6 percent ad valorem, a column 2 rate of 27.5 percent ad valorem, and a LDDC rate of 2.2 percent ad valorem. Imports classified in TSUS item 692.35 are eligible for duty-free treatment under the GSP, the CBERA, and the United States-Israel Free Trade Area Implementation Act of 1985.

Beam hanger brackets.—U.S. imports of cast-steel beam hanger brackets for on-highway trucks are reported for statistical purposes under TSUSA item 692.3209, "beam hanger brackets," and TSUSA item 692.3390, which includes miscellaneous motor-vehicle parts covered by the APTA. Prior to January 1, 1986, imports of beam hanger brackets from all countries except Canada were reported under TSUSA item 692.3290, which included a wide variety of motor-vehicle parts. Imports classified in TSUS item 692.32 are currently dutiable at a column 1 rate of 3.2 percent ad valorem, a column 2 rate of 25 percent ad valorem, and a LDDC rate of 3.1 percent ad valorem (table II-1). Imports of beam hanger brackets under TSUS item 692.32 are eligible for duty-free treatment under the GSP (except designated beneficiaries Brazil, Mexico, and Taiwan), the CBERA, and the United States-Israel Free Trade Area Implementation Act of 1985.

Sockets and suspension brackets.—U.S. imports of cast-steel sockets and suspension brackets for military trucks are reported for statistical purposes under TSUSA item 692.3295, which includes numerous motor-vehicle parts. Prior to January 1, 1986, imports of sockets and suspension brackets were included in TSUSA item 692.3290, which also included a wide variety of motor-vehicle parts. The current rates of duty for imports classified in TSUS item 692.32 are discussed above in the section on beam hanger brackets.

Parts of valves.—Imported steel valve castings are classified in TSUS items 680.17, 680.25, and 680.27. Imported steel valve castings classified in TSUS item 680.17 are reported under items 680.1742, 680.1745, 680.1750, 680.1755, 680.1760, 680.1765, and 680.1768 of the TSUSA. Imports classified in TSUS item 680.17 are currently dutiable at a column 1 rate of 8.5 percent ad valorem, a column 2 rate of 45 percent ad valorem, and a LDDC rate of 8 percent ad valorem (table II-1). Imports classified in TSUS item 680.17 are eligible for duty-free treatment under the GSP, the CBERA, and the United States-Israel Free Trade Area Implementation Act of 1985. The rates of duty for imports classified in TSUS items 680.25 and 680.27 are also presented in table II-1.

U.S. Producers

Axle parts

The petition in this investigation names five producers (all are petitioners) of cast-steel axle parts for off-highway heavy construction vehicles: Harrison Steel Castings Co., Attica, IN; National Castings, Inc., Cicero, IL; Racine Steel Castings, Racine, WI; Sivyer Steel Corp., Bettendorf, IA; and Texas Steel Co., Fort Worth, TX. Each of the five provided data in response to the Commission's questionnaire. In addition to producers named in the petition, Rockwell International, Atchison, KS, also produces the subject axle parts and has responded to the Commission's questionnaire; Rockwell is in opposition to the petition. A seventh producer, * * *, produces axle parts * * * but did not provide usable data in response to the Commission's questionnaire. Although some producers of axle parts have reportedly gone out of business or otherwise ceased to produce axle parts in recent years, the only producer for which the cessation of production has been confirmed is * * *, which indicated that it has not produced axle housings since 1983, but provided no data on the magnitude of its production prior to 1983. The reporting producers and each producer's percentage distribution of reported U.S. production of the axle parts in 1984 and 1985 are presented in the following tabulation (in percent):

Producer	Share of production 1984	Share of production 1985
Harrison Steel Castings Co	***	***
National Castings, Inc	***	***
Racine Steel Castings	***	***
Rockwell International	***	***
Sivyer Steel Corp	***	***
Texas Steel Co	***	***
	100.0	100.0

* * *. Axle parts accounted for * * * percent of * * * total production of steel castings in 1985.

*   *   *   *   *   *   *

Levers

The petition names three producers (all are petitioners) of cast-steel levers for front-end loaders and crawler tractors: National Castings, Inc., Cicero, IL; Racine Steel Castings, Racine, WI; and Sivyer Steel Corp., Bettendorf, IA. Each of the three provided data in response to the Commission's questionnaire. However, Racine Steel Castings indicated that it did not produce the subject levers during 1981-85. In addition to producers named in the petition, Omaha Steel Castings, Omaha, NE, and Texas Steel Co., Fort Worth, TX, produce the subject levers. Omaha Steel Castings and Texas Steel Co. * * *. * * * ceased to produce levers in 1980. The four producers and each producer's percentage distribution of reported U.S. production of the levers in 1984 and 1985 are shown in the following tabulation (in percent):

Producer	Share of production 1984	1985
National Castings, Inc	***	***
Omaha Steel Castings	***	***
Sivyer Steel Corp	***	***
Texas Steel Co	***	***
	100.0	100.0

* * *. National Castings produces levers at its Cicero, IL, facility, along with axle parts and other steel castings. National's levers are produced with a * * *. National also produces beam hanger brackets, sockets and suspension brackets, and other steel castings at its Toledo, OH, facility. Levers accounted for * * * percent of National's total production of steel castings in 1985.

Sivyer Steel Corp. produces levers, axle parts, valve parts, and other steel castings at its plant in Bettendorf, IA. Levers accounted for * * * percent of Sivyer's production of steel castings * * *.

Omaha Steel Castings stated in its questionnaire response that "* * *." Omaha Steel Castings alleges that its * * *. * * *.

Drive sprockets

The petition in this investigation names two producers of drive sprockets for track-laying construction machinery and track-laying tractors, Racine Steel Castings, Racine, WI, and Wehr Steel Corp., Milwaukee, WI. Both companies are petitioners and both provided data in response to the Commission's questionnaire, although Wehr's data were incomplete. In addition to the producers named in the petition, Maynard Steel Casting Co., Racine, WI, indicated that it produced * * * tons of drive sprockets in 1985 when it was the * * *. Maynard provided only limited data in response to the Commission's questionnaire and did not indicate whether it is in support of or in opposition to the petition. * * * produced drive sprockets until 1983 for * * *, but provided no data on the magnitude of its production prior to 1983. Each reporting producer's percentage distribution of U.S. production of drive sprockets in 1984 and 1985 is shown in the following tabulation (in percent):

Producer	Share of production 1984	1985
Maynard Steel Casting Co	***	***
Racine Steel Castings	***	***
Wehr Steel Corp	***	***
	100.0	100.0

* * * was Racine Steel Castings. Drive sprockets accounted for * * * percent of Racine's total production of all steel castings in 1985. Racine also produces axle parts, beam hanger brackets, sockets and suspension brackets, parts of valves, and other steel castings at its establishment in Racine, WI. Racine is currently in Chapter 11 status.

Beam hanger brackets

The petition in this investigation names three producers (all are petitioners) of beam hanger brackets for class 6, 7, and 8 on-highway trucks: Grede Foundries, Inc., Milwaukee, WI; National Castings, Inc., Cicero, IL; and Racine Steel Castings, Racine, WI. Each of the three provided data in response to the Commission's questionnaire. In addition to the producers named in the petition, Missouri Steel Castings Co., Joplin, MO, reported that it produces beam hanger brackets. 1/ Missouri Steel Castings Co. * * *. The four producers and each producer's percentage distribution of U.S. production of beam hanger brackets in 1984 and 1985 are presented in the following tabulation (in percent):

Producer	Share of production 1984	Share of production 1985
Grede Foundries, Inc	***	***
Missouri Steel Castings Co	***	***
National Castings, Inc	***	***
Racine Steel Castings	***	***
	100.0	100.0

* * *. Indeed, National Castings was * * *. National produces beam hanger brackets at its foundry in Toledo, OH, and not at its foundry in Cicero, IL, where it produces the subject axle parts and levers. 2/

Sockets and suspension brackets

National Castings and Racine Steel Castings, both petitioners, are the only two U.S. producers of sockets and suspension brackets for 5-ton military trucks. Each producer's percentage distribution of reported U.S. production of the sockets and suspension brackets in 1984 and 1985 is shown in the following tabulation (in percent):

Producer	Share of production 1984	Share of production 1985
National Castings, Inc	***	***
Racine Steel Castings	***	***
	100.0	100.0

National Castings was * * *, and Racine was * * *. National produces sockets and suspension brackets at its Toledo, OH, facility, along with beam hanger brackets and other products. 3/

1/ It was alleged by respondents in this investigation that Dayton-Walther Corp., Dayton, OH, and Huron Casting, Pigeon, MI, are also producers of beam hanger brackets. Dayton-Walther and Huron were contacted concerning their production, and it was determined that they do not produce beam hanger brackets, but a similar product.

2/ National could produce beam hanger brackets and sockets and suspension brackets * * *. Representatives of National told Commission staff members that it is * * *.

3/ Ibid.

Parts of valves

Perhaps 100 foundries produce cast-steel parts of valves in the United States. Many of these foundries are believed to produce such parts of valves on an ad hoc, "job shop" basis. The petition in this investigation names 34 producers, of which 28 are petitioners. The 34 producers are believed to account for a large share of total U.S. production of cast-steel parts of valves. The Commission sent questionnaires to the 34 producers and to 65 other foundries believed to produce cast-steel parts of valves. Of the 28 petitioners, 21 responded to the Commission's questionnaire; of the 21 that responded, 3 indicated that they did not produce cast-steel parts of valves during the 1981-85 period, and 1 indicated that it had terminated its operations. In all, 27 producers (17 petitioners) provided usable data in response to the Commission's questionnaire. Of the 27 producers that provided usable data, 21 indicated that they support the petition, 1 indicated that it opposes the petition, 3 indicated that they do not wish to take a position either in support of or in opposition to the petition, and 2 made no indication concerning their position. The producers that accounted for *** percent or more of total production of cast-steel parts of valves in either 1984 or 1985 are shown in the following tabulation (in percent):

Producer	Share of production 1984	1985
M.C.C. Pacific Southern Foundries, Bakersfield, CA	***	***
Missouri Steel Castings Co., Joplin, MO	***	***
Quaker Alloy Casting Co., Myerstown, PA	***	***
Quality Electric Steel Castings, Inc., Houston, TX	***	***
Rockwell International, Atchison, KS	***	***
Sivyer Steel Corp., Bettendorf, IA	***	***
Texas Foundries, Inc., Lufkin, TX	***	***
Texas Steel Co., Ft. Worth, TX	***	***
The Duriron Co., Dayton, OH	***	***
Vulcan Steel Foundry Co., Oakland, CA	***	***
Westran Corp., Muskegon, MI	***	***
W-K-M Division, Joy Manufacturing Co., Houston, TX	***	***
15 other producers	23.0	20.2
	100.0	100.0

Of the 12 producers listed in the tabulation, all except Rockwell International support the petition. Of the 27 producers, 21 support the petition; only one (Rockwell) is in opposition to the petition. The 21 producers that support the petition accounted for 83.8 percent of U.S. production in 1984 and 87.3 percent in 1985.

Of the 12 listed producers, 4 produce cast-steel parts of valves for captive consumption. Of the 27 producers that responded to the questionnaire, 7 produce cast-steel parts of valves for captive consumption. These 7 producers accounted for 27.2 percent of U.S. production in 1984 and 26.5 percent in 1985.

Of the 12 listed producers, 2 ceased production during 1981-85, and 1 ceased to produce in 1986. M.C.C. Pacific Southern Foundries closed its foundry on June 30, 1985. M.C.C. had produced castings for a related company, M.C.C. Pacific Valves, Long Beach, CA. M.C.C. Pacific Valves has * * *. The Duriron Co., a captive producer and one of the 12 major producers, shut down its green sand steel casting production in 1983. Duriron stated in its questionnaire response that "* * *." Vulcan Steel Foundry was permanently closed in February 1986.

Among other producers responding to the Commission's questionnaire, NIBCO, Inc., Elkhart, IN, a producer of cast-steel parts of valves and of completed valves, shut down its small experimental foundry in October 1984. NIBCO stated that "* * *." The Walworth Co., King of Prussia, PA, also a producer of cast-steel parts of valves and of completed valves, closed its Greensburg, PA, foundry in 1981 and sold its Elizabeth, NJ, foundry in 1985 (the Elizabeth foundry is no longer in business). Walworth has * * * because of "* * *."

The Cast Metals Federation provided the Commission with information on 58 foundries that have closed or are no longer producing steel castings. Cast-steel parts of valves reportedly accounted for the bulk of production in 14 of the 58 foundries. 1/

U.S. Importers

Eighteen importers import one or more of the subject steel castings for construction equipment, tractors, and trucks, and 44 importers reported imports of cast-steel parts of valves. A discussion of importers for each of the specific product categories is presented below.

Axle parts

There are eight importers 2/ of cast-steel axle parts for off-highway heavy construction vehicles. The eight importers and each importer's

---

1/ One of the foundries that closed, Ross-Meehan Foundries, Chattanooga, TN, submitted a letter to the Cast Metals Federation indicating that the primary factor in its demise was the price of foreign castings. A significant share of Ross-Meehan's sales was to * * *.

2/ In addition, * * *.

percentage distribution of U.S. imports of the axle parts in 1984 and 1985, are shown in the following tabulation (in percent):

Importer	Share of imports 1984	1985
* * *	***	***
* * *	***	***
* * *	***	***
* * *	***	***
* * *	***	***
* * *	***	***
* * *	***	***
* * *	***	***
	100.0	100.0

The principal importer of the subject axle parts is * * *. Indeed, seven of the eight importers import for captive use. The only importer importing for resale is * * *.

Levers

There are four importers of levers for front-end loaders and crawler tractors. The four importers and each importer's percentage distribution of U.S. imports of levers in 1984 and 1985, are shown in the following tabulation (in percent):

Importer	Share of imports 1984	1985
* * *	***	***
* * *	***	***
* * *	***	***
* * *	***	***
	100.0	100.0

The principal importer of the subject levers in 1985 was * * *. * * * import for captive use. * * *.

Drive sprockets

There are seven importers of cast-steel drive sprockets for track-laying construction machinery and track-laying tractors. The seven importers and each importer's percentage distribution of U.S. imports of drive sprockets in 1984 and 1985, are shown in the following tabulation (in percent):

Importer	Share of imports 1984	1985
* * *	***	***
* * *	***	***
* * *	***	***
* * *	***	***
* * *	***	***
* * *	***	***
* * *	***	***
	100.0	100.0

Of the seven importers, only * * * imports for captive use.

Beam hanger brackets

There are 5 importers of cast-steel beam hanger brackets for class 6, 7, and 8 on-highway trucks. The 5 importers and each importer's percentage distribution of U.S. imports of beam hanger brackets in 1984 and 1985, are shown in the following tabulation (in percent):

Importer	Share of imports 1984	1985
* * *	***	***
* * *	***	***
* * *	***	***
* * *	***	***
* * *	***	***
	100.0	100.0

The largest importer by far is * * *. All of the importers except for * * * import for captive use.

Sockets and suspension brackets

* * *. All of * * *. * * * of imported sockets and suspension brackets. * * *.

Parts of valves

Forty-four importers have provided data in response to the Commission's questionnaire on their imports of cast-steel parts of valves. Only three importers imported over 1,000 tons of cast-steel parts of valves in either 1984 or 1985. Each of these importers' percentage distribution of U.S. imports in 1984 and 1985, is shown in the following tabulation (in percent):

Importer	Share of imports 1984	Share of imports 1985
* * *	***	***
* * *	***	***
* * *	***	***
All other	55.1	42.8
	100.0	100.0

All three of the largest importers are producers of complete steel valves that import castings for captive use. Indeed, of the 44 importers, 30 importers, accounting for approximately 92 percent of imports in 1985, import steel valve castings for captive use in the production or repair of completed valves.

The largest importer, * * *. * * * imports castings for machining and assembly into valves in the United States. * * *. * * * also imports * * *. All the rough castings are advanced in the United States and assembled into valves.

* * * is a large producer of steel valves. * * * imports rough castings from * * * for machining and valve assembly in the United States.

* * * imports cast-steel parts of valves for its * * *. * * * cast-steel parts of valves are rough castings imported mainly from * * *. * * * questionnaire response states for * * * that "* * *." "* * *." "* * *." "* * *."

The U.S. Market

Apparent U.S. consumption

Table II-2 presents the known apparent U.S. consumption of the subject cast-steel products.

Table II-2.—Certain steel castings: Apparent U.S. consumption, 1981-85

(In tons)

Item	1981	1982	1983	1984	1985
Axle parts	15,971	9,292	8,107	13,941	12,267
Levers	***	***	***	***	6,239
Drive sprockets	1/ ***	***	***	***	***
Beam hanger brackets	***	***	***	2,504	2,149
Sockets and suspension brackets	***	***	***	***	***
Parts of valves	54,965	45,749	20,663	27,236	31,330

1/ Excluding imports of * * *, which was not able to report import data for 1981.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Axle parts.—Apparent U.S. consumption of the subject axle parts decreased by 41.8 percent in 1982 and 12.8 percent in 1983, increased by 72.0 percent in 1984, and decreased by 12.0 percent in 1985.

Levers.—Apparent U.S. consumption of the subject levers decreased by * * * percent in 1982 and * * * percent in 1983, increased by * * * percent in 1984, and decreased by * * * percent in 1985.

Drive sprockets.—Apparent U.S. consumption of the subject drive sprockets decreased by * * * percent 1/ in 1982, increased by * * * percent in 1983 and * * * percent in 1984, and decreased by * * * percent in 1985.

Beam hanger brackets.—Apparent U.S. consumption of the subject beam hanger brackets decreased by * * * percent in 1982 and * * * percent in 1983, increased by * * * percent in 1984, then decreased by 14.2 percent in 1985.

Sockets and suspension brackets.—Apparent U.S. consumption of the subject sockets and suspension brackets decreased by * * * percent in 1982, increased by * * * percent in 1983 and * * * percent in 1984, and decreased by * * * percent in 1985.

Parts of valves.—Apparent U.S. consumption of cast-steel parts of valves decreased by 16.8 percent in 1982 and by 54.8 percent in 1983, and then increased by 31.8 percent in 1984 and by 15.0 percent in 1985.

Channels of distribution

Axle parts, levers, and drive sprockets.—Cast-steel axle parts, levers, and drive sprockets have similar channels of distribution. All three products are predominantly distributed to original-equipment manufacturers (OEM's) that finish them into parts ready for mounting onto new machinery or for sale as replacement parts in the aftermarket. Salesmen, commissioned agents, and manufacturers' representatives are most often employed to make direct contact with potential customers. A number of foundries have enjoyed long-term purchaser-producer relationships with their major customers and do not actively market their products.

Beam hanger brackets and sockets and suspension brackets.—Industry sources note that in the U.S. market, most sales of beam hanger brackets and sockets and suspension brackets are made directly to end users. The major domestic market for beam hanger brackets is the heavy truck axle industry, consisting of two or three producers, whereas the major domestic market for sockets and suspension brackets consists of the few producers of 5-ton military trucks. Cast-steel beam hanger brackets and sockets and suspension brackets are custom made to each individual purchaser's specifications.

1/ Excluding 1982 imports of * * *, which was not able to report import data for 1981.

The vast majority of beam hanger brackets and sockets and suspension brackets are sold f.o.b. the foundry. Industry officials indicate that purchasers of these castings are normally located within 500 miles of the production facility, and they transport the products by truck. Transportation costs were noted to be unimportant in relation to delivered price, amounting often to $*** per ton.

Parts of valves.—Cast-steel parts of valves are sometimes sold to distributors, but more often are sold directly to manufacturers of steel valves. In addition, cast-steel parts of valves are used in the captive production of steel valves; 4 of the 12 major producers of cast-steel parts of valves produce for captive use. * * * produces only for captive use, transferring the valve parts to its other establishments for machining and assembly into finished valves. According to industry sources, U.S. producers have a clear advantage over most foreign competitors in marketing their parts of valves, because of long-established relationships with customers and superior after-sale service capabilities. Furthermore, domestic producers tend to be within relatively close proximity of their major customers, perhaps allowing the producers to gain a competitive edge in both delivery time, transportation costs, and in adjusting production schedules.

The Question of Increased Imports

U.S. imports

U.S. imports of the subject steel castings during 1981-85 are presented in table II-3. Import trends for each of the product categories are discussed below.

Axle parts.—The volume of U.S. imports of the subject axle parts decreased by 55.8 percent in 1982, increased by 7.8 percent in 1983 and 91.9 percent in 1984, and decreased by 6.7 percent in 1985. Most of the imports of axle parts have consisted of rough castings. Imports of rough castings and advanced castings of axle parts by country in 1985 are presented in appendix table D-6. The principal sources of U.S. imports in 1985 were Japan and Spain.

Levers.—The volume of U.S. imports of the subject levers increased by * * * percent in 1982, * * * in 1983, and increased by * * * percent in 1984 and * * * percent in 1985. Most of the imports of levers have consisted of rough castings. Imports of rough castings and advanced castings of levers by country in 1985 are presented in table D-7. The only sources of U.S. imports in 1985 were France and Japan.

Drive sprockets.—The volume of U.S. imports of drive sprockets decreased by * * * percent in 1982, 1/ increased by 21.4 percent in 1983 and by 18.3 percent in 1984, and decreased by 16.8 percent in 1985. During 1981-84, most imports of drive sprockets consisted of rough castings, but in 1985 imports of advanced castings surpassed imports of rough castings. Imports of rough castings and advanced castings of drive sprockets by country in 1985 are presented in table D-8. The principal sources of U.S. imports in 1985 were Italy and West Germany.

1/ Excluding 1982 imports of * * *, which was not able to report data for 1981.

Table II-3.--Certain steel castings: U.S. imports, by types, 1981-85

Item	1981	1982	1983	1984	1985
	Quantity (tons)				
Axle parts	1/ 1,930	854	921	1,767	1,649
Levers	***	***	***	***	***
Drive sprockets	2/ 819	738	896	1,060	882
Beam hanger brackets	***	1,036	1,151	2,060	1,659
Sockets and suspension brackets	0	***	***	0	***
Parts of valves	8,556	12,067	4,302	7,782	8,908
	Value (1,000 dollars)				
Axle parts	3,945	1,764	1,832	3,168	2,797
Levers	***	***	***	***	***
Drive sprockets	2/ 1,585	1,409	1,676	1,991	1,705
Beam hanger brackets	***	1,464	2,235	4,305	3,685
Sockets and suspension brackets	-	***	***	-	***
Parts of valves	23,372	29,499	10,826	17,451	20,440
	Unit value (per ton)				
Axle parts	$2,044	$2,066	$1,989	$1,793	$1,696
Levers	***	***	***	***	***
Drive sprockets	1,935	1,909	1,871	1,878	1,933
Beam hanger brackets	***	1,413	1,942	2,090	2,221
Sockets and suspension brackets	-	***	***	-	***
Parts of valves	2,732	2,445	2,517	2,242	2,295

1/ In addition, * * *.
2/ * * *, which accounted for * * * percent of U.S. imports of drive sprockets during 1982-85, was not able to report data for 1981. Therefore, import data for 1981 may be understated.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Beam hanger brackets.--The volume of U.S. imports of beam hanger brackets decreased by * * * percent in 1982, increased by 11.1 percent in 1983 and by 79.0 percent in 1984, and decreased by 19.5 percent in 1985. During 1981-83, most imports of beam hanger brackets consisted of rough castings; in 1984 and 1985, imports of advanced castings were greater than imports of rough castings. Imports of rough castings and advanced castings of beam hanger brackets by country in 1985 are presented in table D-9. The principal sources of U.S. imports in 1985 were Brazil and Spain.

Sockets and suspension brackets.—There were virtually * * *. Imports of sockets and suspension brackets in 1985 amounted to * * * tons of * * * castings, valued at $***. The only source of the imports was Argentina (table D-10). 1/

Parts of valves.—The volume of U.S. imports of steel castings of parts of valves increased by 41.0 percent in 1982, decreased by 64.3 percent in 1983, increased by 80.9 percent in 1984, and increased by 14.5 percent in 1985. During 1981-84, most imports of cast-steel parts of valves consisted of advanced castings, but in 1985 imports of rough castings surpassed imports of advanced castings. Imports of rough castings and advanced castings of parts of valves in 1985 are presented in table D-11. The principal sources of imports in 1985 were Canada, Japan, Portugal, the Republic of Korea, and Spain.

Ratios of imports to production

The ratios of reported U.S. imports to reported U.S. production of the subject steel castings are shown in table II-4. For each of the subject products, the ratios of imports to production tended to increase irregularly during 1981-85. Ratios of imports to production peaked in 1985 for axle parts, levers, and sockets and suspension brackets; in 1984 for parts of valves; in 1983 for beam hanger brackets; and in 1982 for drive sprockets.

Table II-4.—Certain steel castings: Ratios of imports to U.S. production, by types, 1981-85

(In percent)

Item	1981	1982	1983	1984	1985
Axle parts	13.5	10.7	13.1	14.5	15.5
Levers	1/	***	***	***	***
Drive sprockets	2/ ***	***	***	***	***
Beam hanger brackets	***	***	***	448.8	329.8
Sockets and suspension brackets	-	***	***	-	***
Parts of valves	18.2	35.1	26.4	39.6	38.8

1/ * * *.
2/ Excludes imports of * * *, which was not able to report import data for 1981.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

1/ The posthearing brief of the French Professional Association for Steel Castings indicates that France exported sockets and suspension brackets to the United States during 1981-85. The response to the Commission's questionnaire from the * * * of sockets and suspension brackets indicated that there were no imports from France.

The Question of Serious Injury

In order to gather data on the question of serious injury to U.S. producers of the subject steel castings, questionnaires were sent to the 34 represented producers listed in the petition, the 6 unrepresented producers listed in the petition, and to 66 other companies that may be producers of the subject castings. The data appearing in this section of the report are aggregated data of the 34 producers that provided usable data in response to the Commission's questionnaire. 1/

U.S. production, capacity, and capacity utilization

Production data presented in this section consist of data obtained from U.S. producers on production of castings of the subject steel products and production of other steel castings produced in the establishments where the subject steel castings are produced. Producers were also asked to report the average annual practical capacity of their U.S. establishments to produce steel castings. 2/ The data obtained on U.S. production, capacity, and capacity utilization of steel castings are shown in table II-5.

Axle parts.—Reported U.S. production of castings of the subject axle parts decreased by 44.0 percent in 1982 and by 12.0 percent in 1983, increased by 73.1 percent in 1984, and decreased by 12.8 percent in 1985. Average capacity to produce axle parts during 1981-85 ranged from a low of 26,451 tons in 1984 to a high of 29,451 tons in 1985. Capacity utilization with respect to axle parts was 52.8 percent in 1981 and then fell below 50 percent each year during 1982-85, reaching a low of 26.0 percent in 1983. Capacity utilization with respect to all steel castings manufactured by producers of axle parts ranged from a high of 60.2 percent in 1981 to a low of 30.8 percent in 1982. Axle parts accounted for 8.9 to 11.1 percent of these firms' total production of steel castings in 1981-85.

Levers.—Reported U.S. production of castings of the subject levers decreased by 38.8 percent in 1982 and by * * * percent in 1983, increased by * * * percent in 1984, and decreased by 9.5 percent in 1985. Average capacity to produce levers increased by * * * percent during 1981-85, because of * * *. Capacity utilization with respect to levers was * * * percent in 1981 and then fell below 40 percent each year during 1982-85, reaching a low of * * * percent in 1983. Capacity utilization with respect to all steel castings manufactured by producers of levers ranged from a high of 55.5 percent in 1981 to a low of 27.6 percent in 1982. Levers accounted for 7.0 to 10.2 percent of these firms' total production of steel castings in 1981-85.

1/ Thirty-two firms responded that they did not cast the subject products during 1981-85. Forty firms either reported negligible production, were not able to provide usable data, or did not respond.

2/ Practical capacity was defined as the greatest level of output a plant can achieve within the framework of a realistic work pattern. Producers were asked to consider, among other factors, a normal product mix and an expansion of operations that could be reasonably attained in their industry and locality in setting capacity in terms of the number of shifts and hours of plant operation.

Table II-5.--Certain steel castings: U.S. production, average capacity, and capacity utilization, by types, 1981-85

Item	1981	1982	1983	1984	1985
	Production (tons)				
By producers of axle parts:					
Axle parts	14,301	8,012	7,052	12,210	10,651
Other steel castings	147,350	74,807	64,564	101,619	84,892
Total	161,651	82,819	71,616	113,829	95,543
By producers of levers:					
Levers	7,711	4,721	***	6,226	5,634
Other steel castings	101,885	49,746	***	64,096	49,332
Total	109,596	54,467	45,064	70,322	54,966
By producers of drive sprockets:					
Drive sprockets	***	***	***	***	***
Other steel castings 1/	***	***	***	***	***
Total 1/	***	***	***	***	***
By producers of beam hanger brackets:					
Beam hanger brackets	***	***	***	459	503
Other steel castings	***	***	***	65,585	52,002
Total	104,827	51,211	44,878	66,044	52,505
By producers of sockets and suspension brackets:					
Sockets and suspension brackets	***	***	***	***	***
Other steel castings	***	***	***	***	***
Total	***	***	***	***	***
By producers of valve parts:					
Valve parts	47,115	34,406	16,322	19,631	22,942
Other steel castings	102,234	58,221	46,049	72,142	65,679
Total	149,349	92,627	62,371	91,773	88,621
	Capacity (tons)				
Of producers of axle parts for:					
Axle parts	27,092	27,092	27,092	26,451	29,451
Other steel castings	241,500	241,500	181,500	182,141	179,141
Total	268,592	268,592	208,592	208,592	208,592
Of producers of levers for:					
Levers	***	***	15,020	17,020	19,020
Other steel castings	***	***	122,320	120,320	118,320
Total	197,340	197,340	137,340	137,340	137,340

Footnotes appear at the end of the table.

Table II-5.—Certain steel castings: U.S. production, average capacity, and capacity utilization, by types, 1981-85—Continued

Item	1981	1982	1983	1984	1985
	Capacity (tons)				
Of producers of drive sprockets for: 2/					
Drive sprockets	***	***	***	***	***
Other steel castings	***	***	***	***	***
Total	***	***	***	***	***
Of producers of beam hanger brackets for:					
Beam hanger brackets	***	***	5,283	5,342	5,375
Other steel castings	***	***	129,543	131,162	131,776
Total	193,160	193,460	134,826	136,504	137,151
Of producers of sockets and suspension brackets for:					
Sockets and suspension brackets	***	***	***	***	***
Other steel castings	***	***	***	***	***
Total	***	***	***	***	***
Of producers of valve parts for:					
Valve parts 3/	56,301	59,450	64,065	64,819	63,374
Other steel castings 3/	134,004	134,991	134,061	134,947	133,393
Total	200,505	204,641	208,326	209,966	206,967
	Capacity utilization (percent)				
By producers of axle parts:					
Axle parts	52.8	29.6	26.0	46.2	36.2
Other steel castings	61.0	31.0	35.6	55.8	47.4
Average	60.2	30.8	34.3	54.6	45.8
By producers of levers:					
Levers	***	***	***	36.6	29.6
Other steel castings	***	***	***	53.3	41.7
Average	55.5	27.6	32.8	51.2	40.0
By producers of drive sprockets: 4/					
Drive sprockets	***	***	***	***	***
Other steel castings	***	***	***	***	***
Average	***	***	***	***	***

Footnotes appear at the end of the table.

Table II-5.—Certain steel castings: U.S. production, average capacity, and capacity utilization, by types, 1981-85—Continued

Item	1981	1982	1983	1984	1985
	Capacity utilization (percent)				
By producers of beam hanger brackets for:					
Beam hanger brackets	***	***	***	8.6	9.4
Other steel castings	***	***	***	50.0	39.5
Average	54.3	26.5	33.3	48.4	38.3
By producers of sockets and suspension brackets for:					
Sockets and suspension brackets	***	***	***	***	***
Other steel castings	***	***	***	***	***
Average	***	***	***	***	***
By producers of valve parts for:					
Valve parts 5/	83.7	57.9	25.5	30.3	36.2
Other steel castings	76.3	43.1	34.4	53.5	49.2
Average	74.5	45.3	29.9	43.7	42.8

1/ Excludes production of other steel castings by * * *, which was not specifically reported to the Commission. * * *. Its production of drive sprockets reportedly is * * * percent of its total production of steel castings.
2/ Excludes capacity data for * * * and for * * *, which did not report capacity data for drive sprockets.
3/ Understated by an undetermined amount because * * *, with a total capacity of * * * tons per year, was not able to allocate its capacity.
4/ Data are for * * *.
5/ Overstated because * * *, with a total capacity of * * * tons per year, was not able to allocate its capacity.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Drive sprockets.—Reported U.S. production of castings of the subject drive sprockets decreased by * * * percent in 1982, increased by * * * percent in 1983, and decreased by * * * percent and * * * percent in 1984 and 1985, respectively. Average capacity to produce drive sprockets * * * during 1981-85. Capacity utilization with respect to drive sprockets during 1981-85 ranged from a low of * * * percent in * * * to a high of * * * percent in * * *. Capacity utilization with respect to all steel castings manufactured by producers of drive sprockets ranged from a high of * * * percent in * * * to a low of * * * percent in * * *. Drive sprockets for the one firm that reported such data accounted for * * * to * * * percent of total production of steel castings in 1981-85.

Beam hanger brackets.—Reported U.S. production of castings of the subject beam hanger brackets decreased by * * * percent in 1982 and by * * * percent in 1983, and increased by * * * percent in 1984 and by 9.6 percent in 1985. Average capacity to produce beam hanger brackets increased from * * * tons in 1981 to 5,375 tons in 1985, or by * * * percent. Capacity utilization with respect to beam hanger brackets was extremely low (* * * percent in 1981, and below 10 percent during 1982-85). Capacity utilization with respect to all steel castings manufactured by producers of beam hanger brackets ranged from a high of 54.3 percent in 1981 to a low of 26.5 percent in 1982. Beam hanger brackets accounted for * * * to * * * percent of these firms' total production of steel castings in 1981-85.

Sockets and suspension brackets.—Reported U.S. production of castings of the subject sockets and suspension brackets decreased by * * * percent in 1982, increased by * * * percent in 1983, increased by * * * percent in 1984, and decreased by * * * percent in 1985. Average capacity to produce sockets and suspension brackets * * * during 1981-85. Capacity utilization with respect to sockets and suspension brackets decreased irregularly from * * * percent in 1981 to * * * percent in 1985. Capacity utilization with respect to all steel castings manufactured by producers of sockets and suspension brackets ranged from a high of * * * percent in * * * to a low of * * * percent in * * *. Sockets and suspension brackets accounted for * * * to * * * percent of these firms' total production of steel castings in 1981-85.

Parts of valves.—Reported U.S. production of steel castings of parts of valves decreased by 27.0 percent in 1982 and by 52.6 percent in 1983, increased by 20.3 percent in 1984 and by 16.9 percent in 1985. Average capacity to produce parts of valves increased by 15.1 percent between 1981 and 1984, and then decreased by 2.2 percent in 1985. Capacity utilization with respect to parts of valves decreased from 83.7 percent in 1981 to 25.5 percent in 1983, then increased to 36.2 percent in 1985. Capacity utilization with respect to all steel castings manufactured by producers of parts of valves ranged from a high of 74.5 percent in 1981 to a low of 29.9 percent in 1983. Parts of valves accounted for 21.4 to 37.1 percent of these firms' total production of steel castings in 1981-85.

U.S. producers' shipments

Axle parts.—Reported U.S. producers' shipments of the subject axle parts decreased by 39.9 percent in 1982 and by 14.8 percent in 1983, increased by 69.4 percent in 1984, and decreased by 12.8 percent in 1985 (table II-6).

Levers.—Reported U.S. producers' shipments of the subject levers decreased by 39.8 percent in 1982 and by 11.5 percent in 1983, increased by 57.0 percent in 1984, and decreased by * * * percent in 1985.

Drive sprockets.—Reported U.S. producers' shipments of the subject drive sprockets decreased by * * * percent in 1982, increased by * * * percent in 1983, increased by * * * percent in 1984, and decreased by * * * percent in 1985.

Beam hanger brackets.—Reported U.S. producers' shipments of beam hanger brackets decreased by * * * percent in 1982 and by * * * percent in 1983, increased by * * * percent in 1984, and increased by 10.4 percent in 1985.

Table II-6.--Certain steel castings: U.S. producers' shipments, by types, 1981-85

Item	1981	1982	1983	1984	1985
	Quantity (tons)				
Axle parts:					
Intra- and inter-company transfers	***	***	***	***	***
Domestic shipments	***	***	***	***	***
Total	14,041	8,438	7,186	12,174	10,618
Levers:					
Intra- and inter-company transfers	0	0	0	0	0
Domestic shipments	7,673	4,623	4,092	6,425	***
Total	7,673	4,623	4,092	6,425	***
Drive sprockets:					
Intra- and inter-company transfers	0	0	0	0	0
Domestic shipments	***	***	***	***	***
Total	***	***	***	***	***
Beam hanger brackets:					
Intra- and inter-company transfers	0	0	0	0	0
Domestic shipments	***	***	***	444	490
Total	***	***	***	444	490
Sockets and suspension brackets:					
Intra- and inter-company transfers	0	0	0	0	0
Domestic shipments	***	***	***	***	***
Total	***	***	***	***	***
Parts of valves:					
Intra- and inter-company transfers	12,261	9,976	5,691	5,285	5,819
Domestic shipments	34,148	23,706	10,670	14,169	16,603
Total	46,409	33,682	16,361	19,454	22,422

Continued

Table II-6.—Certain steel castings: U.S. producers' shipments, by types, 1981-85—Continued

Item	1981	1982	1983	1984	1985
	Value (1,000 dollars)				
Axle parts:					
Intra- and inter- company transfers	***	***	***	***	***
Domestic shipments	***	***	***	***	***
Total	25,495	16,603	14,141	24,883	19,963
Levers:					
Intra- and inter- company transfers	-	-	-	-	-
Domestic shipments	11,368	7,472	6,297	10,839	***
Total	11,368	7,472	6,297	10,839	***
Drive sprockets:					
Intra- and inter- company transfers	-	-	-	-	-
Domestic shipments	***	***	***	***	1/ ***
Total	***	***	***	***	1/ ***
Beam hanger brackets:					
Intra- and inter- company transfers	-	-	-	-	-
Domestic shipments	***	***	***	1,037	1,233
Total	***	***	***	1,037	1,233
Sockets and suspension brackets:					
Intra- and inter- company transfers	-	-	-	-	-
Domestic shipments	***	***	***	***	***
Total	***	***	***	***	***
Parts of valves:					
Intra- and inter- company transfers	51,229	41,952	25,001	27,017	26,073
Domestic shipments	117,153	91,271	48,300	58,725	65,803
Total	168,382	133,223	73,301	85,742	91,876

1/ Excludes the value of shipments of * * *, which did not provide data on the value of shipments.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Sockets and suspension brackets.—Reported U.S. producers' shipments of sockets and suspension brackets decreased by * * * percent in 1982, increased by * * * percent in 1983 and by * * * percent in 1984, and decreased by * * * percent in 1985.

Parts of valves.—Reported U.S. producers' shipments of cast-steel parts of valves decreased by 27.4 percent in 1982 and by 51.4 percent in 1983, and then increased by 18.9 percent in 1984 and 15.3 percent in 1985.

U.S. producers' exports

There were no reported U.S. exports of axle parts, levers, drive sprockets, beam hanger brackets, or sockets and suspension brackets during 1981-85. Exports of parts of valves are presented in the following tabulation:

	Quantity (Tons)	Value (1,000 dollars)
1981	***	***
1982	151	578
1983	129	521
1984	173	793
1985	***	***

The tonnage of U.S. exports of cast-steel parts of valves decreased by * * * percent in 1982 and by 14.6 percent in 1983, increased by 34.1 percent in 1984, and decreased by * * * percent in 1985. As a share of U.S. producers' shipments, exports of cast-steel parts of valves were less than 1 percent in each of the years 1981-85.

U.S. producers' inventories

U.S. producers' inventories of their own production of steel castings are presented in table II-7. As a share of domestic producers' total shipments, reported inventories of axle parts fluctuated between a low of 7.8 percent in 1984 and a high of 13.0 percent in 1983. Reported inventories of levers as a share of domestic producers' total shipments fluctuated between a low of * * * percent in 1981 and a high of 13.2 percent in 1982. Reported inventories of drive sprockets, beam hanger brackets, and sockets and suspension brackets as a share of domestic producers' total shipments fluctuated between * * * and * * *, but are not necessarily representative ratios because they reflect data for only one company, * * *, which reported the * * *. Reported inventories of parts of valves as a share of domestic producers' total shipments were between 10.2 and 10.9 percent in each of the years 1981-85 except for 1982 when the ratio was 8.7 percent.

U.S. employment and productivity

Data collected on employment, hours worked, wages paid, total compensation paid, average hourly wages, and productivity are presented in tables II-8 to II-13.

The number of production and related workers producing each of the subject products decreased irregularly between 1981 and 1985. The only exception was for beam hanger brackets, which experienced an increase in the number of workers in 1984 and 1985; however, the number of workers producing beam hanger brackets in 1985 was * * * percent below the corresponding number in 1981. The data on production and related workers should be viewed with some caution, as different producers had different methods of allocating the

Table II-7.—Certain steel castings: U.S. producers' yearend inventories, by types, 1981-85

Item	1981	1982	1983	1984	1985
	Quantity (tons)				
Axle parts	1,774	798	931	947	1,029
Levers	***	299	***	***	***
Drive sprockets	***	***	***	***	***
Beam hanger brackets	***	***	***	***	***
Sockets and suspension brackets	***	***	***	***	***
Parts of valves	3,444	2,060	1,256	1,226	1,333
	Ratio of inventories to total shipments (percent)				
Axle parts 1/	12.6	9.5	13.0	7.8	9.7
Levers 2/	***	13.2	***	***	***
Drive sprockets 3/	***	***	***	***	***
Beam hanger brackets 3/	***	***	***	***	***
Sockets and suspension brackets 3/	***	***	***	***	***
Parts of valves 4/	10.5	8.7	10.9	10.7	10.2

1/ Excluding inventories for * * *, which was not able to provide inventories by product.
2/ Excluding shipments for * * *, which was not able to provide inventories by product.
3/ Data are * * *.
4/ Based on the shipments of those domestic producers that also reported inventory data.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

number of workers producing each product. Some producers allocated on the basis of production or sales, and others reported that all the workers in a given establishment worked on a given product (albeit intermittently), even though the product may have accounted for a small share of overall production. A more representative figure for employment trends than the number of workers is the number of hours worked.

Table II-8.—Average number of production and related workers employed in establishments of firms that produce the subject axle parts, hours worked by, wages paid to, and total compensation of such workers, average hourly wages paid, and productivity, 1981-85 1/

Product	1981	1982	1983	1984	1985
Production and related workers producing—					
Axle parts	454	399	301	346	306
All steel castings	4,870	3,485	2,517	3,348	2,929
Hours worked by production and related workers producing—					
Axle parts—1,000 hours	891	506	442	653	537
All steel castings—do	9,481	5,185	4,395	6,514	5,343
Wages paid to production and related workers producing—					
Axle parts 1,000 dollars	7,752	4,822	4,231	6,405	5,612
All steel castings—do	88,395	52,198	45,165	67,566	58,357
Total compensation paid to production and related workers producing—					
Axle parts 1,000 dollars	9,182	5,989	5,193	7,869	6,973
All steel castings—do	122,053	74,638	63,591	94,151	80,632
Average hourly wages of production and related workers producing—					
Axle parts	$8.70	$9.53	$9.57	$9.81	$10.45
All steel castings	9.32	10.07	10.28	10.37	10.92
Output per 1,000 hours worked of production and related workers producing—					
Axle parts—tons	16.1	15.8	16.0	18.7	19.8
All steel castings—do	17.0	16.0	16.3	17.5	17.9

1/ Data presented are for 6 producers that together accounted for 100 percent of the production of axle parts in 1985.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table II-9.—Average number of production and related workers employed in establishments of firms that produce the subject levers, hours worked by, wages paid to, and total compensation of such workers, average hourly wages paid, and productivity, 1981-85 1/

Product	1981	1982	1983	1984	1985
Production and related workers producing—					
Levers	320	194	180	241	234
All steel castings	2,854	1,704	1,378	1,907	1,639
Hours worked by production and related workers producing—					
Levers—1,000 hours	349	214	183	291	253
All steel castings—do	5,448	2,862	2,521	3,740	2,955
Wages paid to production and related workers producing—					
Levers—1,000 dollars	3,619	2,354	2,161	3,389	3,049
All steel castings—do	53,716	30,100	26,385	39,306	32,849
Total compensation paid to production and related workers producing—					
Levers—1,000 dollars	4,973	3,310	3,112	4,620	4,291
All steel castings—do	80,974	45,684	39,993	58,783	48,852
Average hourly wages of production and related workers producing—					
Levers	$10.37	$11.00	$11.81	$11.65	$12.05
All steel castings	9.86	10.52	10.47	10.51	11.12
Output per 1,000 hours worked of production and related workers producing—					
Levers—tons	22.1	22.1	***	21.4	22.3
All steel castings—do	20.1	19.0	17.9	18.8	18.6

1/ Data presented are for 4 producers that together accounted for 100 percent of the production of levers in 1985.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table II-10.—Average number of production and related workers employed in establishments of firms that produce the subject drive sprockets, hours worked by, wages paid to, and total compensation of such workers, average hourly wages paid, and productivity, 1981-85 1/

Product	1981	1982	1983	1984	1985
Production and related workers producing—					
Drive sprockets	***	***	***	***	***
All steel castings	***	***	***	***	***
Hours worked by production and related workers producing—					
Drive sprockets 1,000 hours	***	***	***	***	***
All steel castings—do	***	***	***	***	***
Wages paid to production and related workers producing—					
Drive sprockets 1,000 dollars	***	***	***	***	***
All steel castings—do	***	***	***	***	***
Total compensation paid to production and related workers producing—					
Drive sprockets 1,000 dollars	***	***	***	***	***
All steel castings—do	***	***	***	***	***
Average hourly wages of production and related workers producing—					
Drive sprockets	$***	$***	$***	$***	$***
All steel castings	***	***	***	***	***
Output per 1,000 hours worked of production and related workers producing—					
Drive sprockets—tons	***	***	***	***	***
All steel castings—do	***	***	***	***	***

1/ Consists of data for only * * *. * * *. Drive sprockets account for * * *.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table II-11.--Average number of production and related workers employed in establishments of firms that produce beam hanger brackets, hours worked by, wages paid to, and total compensation of such workers, average hourly wages paid, and productivity, 1981-85 1/

Product	1981	1982	1983	1984	1985
Production and related workers producing--					
Beam hanger brackets	***	***	6	17	19
All steel castings	2,740	1,714	1,347	1,920	1,670
Hours worked by production and related workers producing--					
Beam hanger brackets 1,000 hours	***	***	***	32	34
All steel castings--do	5,250	2,918	2,563	3,697	3,042
Wages paid to production and related workers producing--					
Beam hanger brackets 1,000 dollars	***	***	***	305	334
All steel castings--do	52,480	31,064	26,409	38,230	32,540
Total compensation paid to production and related workers producing--					
Beam hanger brackets 1,000 dollars	***	***	***	390	432
All steel castings--do	77,755	47,761	***	57,851	48,846
Average hourly wages of production and related workers producing--					
Beam hanger brackets	$***	$***	$***	$9.53	$9.82
All steel castings	10.00	10.65	10.30	10.34	10.70
Output per 1,000 hours worked of production and related workers producing--					
Beam hanger brackets tons	***	***	***	14.3	14.8
All steel castings--do	20.0	17.6	17.5	17.9	17.3

1/ Data presented are for 4 producers that together accounted for 100 percent of the production of beam hanger brackets in 1985.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table II-12.—Average number of production and related workers employed in establishments of firms that produce sockets and suspension brackets, hours worked by, wages paid to, and total compensation of such workers, average hourly wages paid, and productivity, 1981-85 1/

Product	1981	1982	1983	1984	1985
Production and related workers producing—					
Sockets and suspension brackets	***	***	***	***	***
All steel castings	***	***	***	***	***
Hours worked by production and related workers producing—					
Sockets and suspension brackets—1,000 hours	***	***	***	***	***
All steel castings—do	***	***	***	***	***
Wages paid to production and related workers producing—					
Sockets and suspension brackets 1,000 dollars	***	***	***	***	***
All steel castings—do	***	***	***	***	***
Total compensation paid to production and related workers producing—					
Sockets and suspension brackets 1,000 dollars	***	***	***	***	***
All steel castings—do	***	***	***	***	***
Average hourly wages of production and related workers producing—					
Sockets and suspension brackets	$***	$***	$***	$***	$***
All steel castings	***	***	***	***	***
Output per 1,000 hours worked of production and related workers producing—					
Sockets and suspension brackets—tons	***	***	***	***	***
All steel castings—do	***	***	***	***	***

1/ Data presented are for 2 producers that together accounted for 100 percent of the production of sockets and suspension brackets in 1985.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table II-13.—Average number of production and related workers employed in establishments of firms that produce cast-steel parts of valves, hours worked by, wages paid to, and total compensation of such workers, average hourly wages paid, and productivity, 1981-85 1/

Product	1981	1982	1983	1984	1985
Production and related workers producing—					
Parts of valves	3,652	2,989	1,989	1,955	2,008
All steel castings	7,569	6,067	4,357	4,883	4,769
Hours worked by production and related workers producing 2/—					
Parts of valves 1,000 hours	4,825	3,432	1,949	2,213	2,194
All steel castings—do	13,288	9,224	7,068	9,007	8,504
Wages paid to production and related workers producing—					
Parts of valves 1,000 dollars	49,343	38,406	24,201	26,195	26,849
All steel castings—do	127,075	95,120	74,505	95,277	93,042
Total compensation paid to production and related workers producing—					
Parts of valves 1,000 dollars	57,975	46,536	30,213	32,613	33,501
All steel castings—do	159,128	123,014	96,850	123,557	120,091
Average hourly wages of production and related workers producing—					
Parts of valves	$9.19	$10.19	$10.51	$10.20	$10.34
All steel castings	8.87	9.52	9.56	9.73	9.92
Output per 1,000 hours worked of production and related workers producing— 3/					
Parts of valves—tons	7.5	7.4	6.5	6.1	7.4
All steel castings—do	9.8	8.7	8.1	9.3	9.4

1/ Data presented on parts of valves are for 18 producers that together accounted for 68.6 percent of the production of parts of valves in 1985. Data presented on all steel castings are for 23 producers that together accounted for 90.5 percent of the production of all steel castings in establishments where parts of valves are produced.

2/ *** did not report data on hours worked.

3/ Based only on firms that reported both production data and data on hours worked.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Axle parts.—Hours worked by production and related workers producing axle parts decreased by 43.2 percent in 1982 and by 12.6 percent in 1983, increased by 47.7 percent in 1984, and decreased by 17.8 percent in 1985. Hours worked by production and related workers producing all steel castings in establishments of firms that produce axle parts decreased by 45.3 percent in 1982 and by 15.2 percent in 1983, increased by 48.2 percent in 1984, and decreased by 18.0 percent in 1985. The trends in wages paid and total compensation paid were similar to those of hours worked. The average hourly wage for production and related workers producing axle parts increased steadily from $8.70 in 1981 to $10.45 in 1985. Output of axle parts per 1,000 hours worked ranged from a low of 15.8 tons in 1982 to a high of 19.8 tons in 1985.

Levers.—Hours worked by production and related workers producing levers decreased by 38.7 percent in 1982 and by 14.5 percent in 1983, increased by 59.0 percent in 1984, and decreased by 13.1 percent in 1985. Hours worked by production and related workers producing all steel castings in establishments of firms that produce levers decreased by 47.5 percent in 1982 and by 11.9 percent in 1983, increased by 48.4 percent in 1984, and decreased by 21.0 percent in 1985. The trends in wages paid and total compensation paid were similar to those of hours worked. The average hourly wage for production and related workers producing levers increased from $10.37 in 1981 to $12.05 in 1985. Output of levers per 1,000 hours worked decreased from 22.1 tons in 1981 and 1982 to 21.4 tons in 1984, then increased to 22.3 tons in 1985.

Drive sprockets.—Hours worked by production and related workers producing drive sprockets decreased by * * * percent in 1982, increased by * * * percent in 1983, and decreased by * * * percent in 1984 and * * * percent in 1985. Hours worked by production and related workers producing all steel castings in establishments of firms that produce drive sprockets decreased by * * * percent in 1982, increased by * * * percent in 1983 and by * * * percent in 1984, and decreased by * * * percent in 1985. The trends in wages paid and total compensation paid were similar to those of hours worked. The average hourly wage for production and related workers producing drive sprockets increased from $*** in 1981 to $*** in 1983, then decreased to a level of $*** in 1984 and 1985. Output of drive sprockets per 1,000 hours worked ranged from a low of * * * tons in 1982 to a high of * * * tons in 1981.

Beam hanger brackets.—Hours worked by production and related workers producing beam hanger brackets decreased by * * * percent in 1982 and by * * * percent in 1983, and increased by * * * percent in 1984 and 6.3 percent in 1985. Hours worked by production and related workers producing all steel castings in establishments of firms that produce beam hanger brackets decreased by 44.4 percent in 1982 and by 12.2 percent in 1983, increased by 44.2 percent in 1984, and decreased by 17.7 percent in 1985. The trends in wages paid and total compensation paid were similar to those of hours worked. The average hourly wage for production and related workers producing beam hanger brackets decreased erratically from $*** in 1981 to $9.82 in 1985. Output of beam hanger brackets per 1,000 hours worked ranged from a low of 14.3 tons in 1984 to a high of * * * tons in 1981.

Sockets and suspension brackets.—Hours worked by production and related workers producing sockets and suspension brackets decreased by * * * percent in 1982, increased by * * * percent in 1983 and by * * * percent in 1984, and decreased by * * * percent in 1985. Hours worked by production and related workers producing all steel castings in establishments of firms that produce sockets and suspension brackets decreased by * * * percent in 1982 and by * * * percent in 1983, increased by * * * percent in 1984, and decreased by * * * percent in 1985. The trends in wages paid and total compensation paid were similar to those of hours worked. The average hourly wage for production and related workers producing sockets and suspension brackets increased from $*** in 1981 to $*** in 1985. Output of sockets and suspension brackets per 1,000 hours worked ranged from a low of * * * tons in 1984 to a high of * * * tons in both 1981 and 1985.

Parts of valves.—Hours worked by production and related workers producing cast-steel parts of valves decreased by 28.9 percent in 1982 and by 43.2 percent in 1983, increased by 13.5 percent in 1984, and decreased by 0.9 percent in 1985. Hours worked by production and related workers producing all steel castings in establishments of firms that produce cast-steel parts of valves decreased by 30.6 percent in 1982 and by 23.4 percent in 1983, increased by 27.4 percent in 1984, and decreased by 5.6 percent in 1985. The trends in wages paid and total compensation paid were similar to those of hours worked, except for parts of valves in 1985. The average hourly wage for production and related workers producing parts of valves increased from $9.19 in 1981 to $10.51 in 1983, then decreased to $10.20 in 1984 before increasing in 1985 to $10.34. Output of parts of valves per 1,000 hours worked decreased from 7.5 tons in 1981 to 6.1 tons in 1984, then increased to 7.4 tons in 1985.

Of the 34 producers that provided data in response to the Commission's questionnaire, 21 indicated that their production and related workers producing the subject products are unionized; 10 indicated that their workers are not unionized; and 3 did not indicate whether or not their employees are unionized. Unions cited include the International Association of Machinists and Aerospace Workers, the International Molders and Allied Workers, the United Auto Workers, and the United Steelworkers.

In response to a question in the Commission's questionnaire, 26 producers of steel castings reported that they reduced the number of production and related workers producing the subject castings by at least 5 percent, or 50 workers, during 1981-85; 2 producers reported no reductions in workers; and 7 producers did not indicate whether or not they experienced reductions in workers. Firms were requested to indicate the date of each reduction, the product line, the number of workers affected, the reason for the reduction, and the duration of the reduction. The total number of employees affected was approximately 5,800. The reported reductions tended to be in the general "steel castings" product line, and not only for the specific product lines that are subject to this investigation. Eleven producers reported reductions in 1981, 19 in 1982, 11 in 1983, 7 in 1984, and 13 in 1985. The principal reason cited for the reductions was "lack of orders," without differentiating whether the reductions were due to imports or to other factors. One firm, * * *, reported that its * * * reduction of * * * workers in 1985 was due to "loss of business to foreign sources."

Financial experience of U.S. producers

Most of the machinery and equipment in the responding foundries within which the subject products are produced is used in the production of more than one product. Producers generally do not maintain complete income-and-loss data on each product line. Depending on the cost accounting system employed, some costs are directly charged to a product line, whereas other costs are allocated through various means. The basis used for allocating the various costs and expenses to each product varied from producer to producer. There are no perfect or standard methods for allocating manufacturing overhead costs and other expenses, but each basis of allocation should have a logical and close relationship to actual production practices in order to apply appropriate or reasonable costs and expenses to each product. Generally, each company uses allocation methods that are based on each firm's objectives for cost control and other management needs, and that take into consideration the cost-benefit rule for the company as a whole.

There are fewer allocations of costs and expenses involved at the level of all steel castings operations than at the product line level. The same is true for divisional operations compared with all steel castings operations. However, there are still some allocations of corporate costs at the divisional level. Hence, the income-and-loss data on different levels of operations that are presented below for the responding firms are limited in their use as an absolute measure of profitability. However, if each producer was consistent from year to year in its bases for allocating costs (and there is no evidence to the contrary), the data presented in this section should reflect, with a reasonable degree of accuracy, profit trends at each level of operations.

Financial experience of U.S. producers of axle parts.—Five producers of axle parts, which together accounted for * * * percent of reported production of axle parts in 1985, provided the Commission with usable financial information. 1/ These data, which include income-and-loss information and selected indicators of the financial condition of the industry, are presented below.

Axle parts.—Four U.S. producers of axle parts supplied usable income-and-loss data for 1981-85. Aggregate net sales of axle parts declined from $19.5 million in 1981 to $10.1 million in 1983, or by 48 percent, and then increased by 84 percent to $18.6 million in 1984 (table II-14). However, such sales declined again by 21 percent to $14.7 million in 1985. Except in 1984, the responding firms reported aggregate operating losses throughout the period under investigation.

Aggregate operating losses were $54,000, or 0.2 percent of sales, in 1981. Such losses increased to $1.9 million, or 14.6 percent of sales, in 1982, and to $1.3 million, or 12.6 percent of sales, in 1983. In 1984, the

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1/ None of the five reporting firms made special allocations to derive the data reported for their operations on all steel castings. One of the four firms reporting on axle parts operations employs a standard cost system, and consequently allocated variances in manufacturing costs on the basis of standard costs and allocated general, selling, and administrative (GS&A) expenses on the basis of sales dollars. The remaining three firms allocated manufacturing costs on the basis of tons produced and allocated GS&A expenses on the basis of sales dollars, tons sold, or cost of sales.

Table II-14.—Income-and-loss experience of 4 U.S. producers 1/ on their operations producing axle parts, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales:					
Trade——1,000 dollars—	***	***	***	***	***
Intra- and intercompany transfers—1,000 dollars—	***	***	***	***	***
Total——do—	19,506	12,648	10,093	18,600	14,694
Cost of goods sold——do—	18,414	13,482	10,519	16,011	14,165
Gross profit——do—	1,092	(834)	(426)	2,589	529
General, selling, and administrative expenses 1,000 dollars—	1,146	1,027	856	963	963
Operating income or (loss) 1,000 dollars—	(54)	(1,861)	(1,282)	1,626	(434)
Interest expense 2/——do—	3	82	99	493	403
Other income or (expense) 2/ 1,000 dollars—	(13)	101	39	91	87
Net income or (loss) before income taxes 2/ 1,000 dollars—	(70)	(1,842)	(1,342)	1,224	(750)
Depreciation and amortization expense included above 1,000 dollars—	670	777	919	841	778
Cash flow from operations 3/ 1,000 dollars—	600	(1,065)	(423)	2,065	28
As a share of net sales:					
Cost of goods sold percent—	94.4	106.6	104.2	86.1	96.4
Gross profit or (loss) percent—	5.6	(6.5)	(4.1)	13.9	3.6
General, selling, and administrative expenses percent—	5.9	8.1	8.5	5.2	6.6
Operating income or (loss) percent—	(0.2)	(14.6)	(12.6)	8.7	(2.9)
Net income or (loss) before income taxes 2/—percent—	(0.3)	(14.5)	(13.2)	6.6	(5.0)
Number of firms reporting operating losses——	3	4	4	1	3
Number of firms reporting net losses——	3	4	4	2	3

1/ These firms accounted for * * * percent of reported U.S. production in 1985.

2/ * * *, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on interest expenses and other income and expenses; hence, net income before taxes may be overstated or understated.

3/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

responding firms earned an aggregate operating income of 1.6 million, or 8.7 percent of sales. However, an aggregate operating loss of $434,000, or 2.9 percent of sales, was sustained in 1985. Pretax net income or loss margins (ratio of net income or loss before income taxes to net sales) followed a trend similar to the operating income or loss margins.

Cash flow from operations decreased from a positive $600,000 in 1981 to a negative $1.1 million in 1982 and a negative $423,000 in 1983. Cash flow rose to $2.1 million in 1984 and then dropped to $28,000 in 1985. Operating losses were reported by three of the four producers in 1981 and 1985; such losses were sustained by all four firms in 1982 and 1983, and only one firm in 1984.

All steel castings.—Usable income-and-loss data were received from five U.S. producers of axle parts on their operations producing all steel castings for fiscal years 1981-85. Reported net sales of all steel castings by the responding U.S. producers fell from $271.8 million in 1981 to $121.8 million in 1983, or by 55 percent, and then increased by 62 percent to $197.6 million in 1984 (table II-15). However, such sales dropped to $171.8 million in 1985, or by 13 percent.

The responding firms reported aggregate operating losses throughout the period of investigation. Such losses jumped from $693,000, or only 0.2 percent of sales, in 1981 to $27.4 million, or 16.7 percent of sales, in 1982, and then declined to $19.8 million, or 16.2 percent of sales, in 1983 and $5.6 million, or 2.7 percent of sales, in 1984. Operating losses rose again to $17.8 million, or 10.3 percent of net sales, in 1985. The pretax net loss margins followed the same trend as the operating loss margins.

Cash flow from operations declined from a positive $10.3 million in 1981 to a negative $17.0 million in 1982 and a negative $11.0 million in 1983. Such cash flow was a negative $16.6 million in 1985, compared with a positive $682,000 in 1984.

Operating losses were sustained by two of the five reporting firms in 1981 and 1984; such losses were reported by four firms during 1982-83 and three firms in 1985.

One firm, * * *, accounting for * * * to * * * percent of total net sales during 1981-85, reported large losses, as shown in the following tabulation:

* * * * * * *

If the data in the above tabulation for * * * are excluded from the aggregate data in table II-15, operating loss margins of 0.2 percent in 1981, 2.7 percent in 1984, and 10.3 percent in 1985 would become operating income margins of * * * percent, * * * percent, and * * * percent, respectively.

Total net sales of axle parts reported by the four firms that provided product line data (see table II-14) ranged between * * * and * * * percent of total net sales of their operations on all steel castings during 1981-85. The income-and-loss data on all steel castings operations of those four firms are summarized in the following tabulation:

* * * * * * *

Table II-15.—Income-and-loss experience of 5 U.S. producers of axle parts 1/ on their operations producing all steel castings, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales:					
Trade—1,000 dollars	***	***	***	***	***
Intra- and intercompany transfers—1,000 dollars	***	***	***	***	***
Total—de	271,805	162,691	121,772	197,555	171,818
Cost of goods sold—do	255,929	175,582	127,542	188,363	176,204
Gross profit—do	15,876	(12,891)	(5,770)	9,192	(4,386)
General, selling, and administrative expenses 1,000 dollars	16,569	14,516	14,034	14,757	13,459
Operating income or (loss) 1,000 dollars	(693)	(27,407)	(19,804)	(5,565)	(17,845)
Interest expense 2/—do	122	1,554	2,445	3,578	3,731
Other income or (expense) 2/ 1,000 dollars	(797)	(401)	404	(799)	(3,270)
Net income or (loss) before income taxes 2/ 1,000 dollars	(1,612)	(29,362)	(21,845)	(9,942)	(24,846)
Depreciation and amortization expense included above 1,000 dollars	11,863	12,379	10,881	10,624	8,285
Cash flow from operations 3/ 1,000 dollars	10,251	(16,983)	(10,964)	682	(16,561)
As a share of net sales:					
Cost of goods sold percent	94.2	107.9	104.7	95.3	102.6
Gross profit or (loss) percent	5.8	(7.8)	(4.6)	4.7	(2.5)
General, selling, and administrative expenses percent	6.1	8.9	11.5	7.5	7.8
Operating income or (loss) percent	(0.2)	(16.7)	(16.2)	(2.7)	(10.3)
Net income or (loss) before income taxes 2/—percent	(0.5)	(17.9)	(17.8)	(4.9)	(14.4)
Number of firms reporting operating losses	2	4	4	2	3
Number of firms reporting net losses	2	4	4	2	3

1/ These firms accounted for * * * percent of reported U.S. production of axle parts in 1985.

2/ * * *, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on interest expenses and other income and expenses; hence, net income before taxes may be overstated or understated.

3/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Overall operations.—Four U.S. producers of axle parts supplied financial data on their companies' overall or divisional operations for accounting years 1981-85. Net sales declined annually from $245.5 million in 1981 to $121.6 million in 1983, or by 50 percent, and then increased to $189.2 million in 1984 (table II-16). However, such sales dropped again to $166.3 million in 1985. An aggregate operating income of $2.8 million in 1981 (1.2 percent of net sales) turned to aggregate operating losses in all succeeding periods. Such losses were $22.9 million in 1982 (14.9 percent of net sales), $13.9 million (11.4 percent of net sales) in 1983, and then declined to $247,000 (0.1 percent of net sales) in 1984. The operating loss rose to $11.0 million (6.5 percent of net sales) in 1985. Aggregate pretax net income and loss margins followed a trend similar to the operating income and loss margins.

Financial condition of U.S. producers.—Key balance sheet information and selected financial ratios of the four U.S. producers of axle parts that provided income-and-loss data on their overall or divisional operations are presented in table II-17.

A comparison of current assets with current liabilities provides an indication of the ability of the company to pay its short-term debts. One such indicator is the ratio of current assets to current liabilities, commonly known as the current ratio. The current ratio for the reporting producers increased from 1.80 in 1981 to 2.38 in 1983 and then declined to 2.22 in 1984 and 1.73 in 1985. A current ratio of more than 2.0 is normally considered to be strong. Another primary indication of short-run solvency is working capital. Aggregate working capital increased irregularly from $23.3 million in 1981 to $28.7 million in 1984, or by 24 percent, and then dropped by 45 percent to $15.8 million in 1985. The net value of property, plant, and equipment declined from $100.6 million in 1981 to $77.0 million in 1985. Total assets decreased by 25 percent during 1981-85.

The ratio of debt to equity indicates the relationship between capital provided by creditors and capital contributed by owners. A falling ratio indicates a decline in total liabilities relative to total equity. The ratio of debt to equity for the four firms declined by 25 percent from 1981 to 1982 and then increased by 39 percent during 1983-85.

The return-on-investment ratios measure the effectiveness of management in employing the resources available to it. The return is measured by various types of investment as presented in table II-17. All of the different measures of return on investment showed a similar trend, declining from a slight positive return in 1981 to a high negative return in 1982. Such negative return declined during 1983-84 and then rose again in 1985.

Investment in property, plant, and equipment.—Only one U.S. producer provided data concerning its investment in facilities employed in the production of axle parts. Its investment, valued at cost, remained at $*** throughout the period covered by the investigation.

Table II-16.--Income-and-loss experience of 4 U.S. producers of axle parts 1/ on their companies' overall or divisional operations, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales----1,000 dollars--	245,486	152,212	121,645	189,232	166,313
Cost of goods sold----do----	227,254	161,261	121,537	175,105	164,337
Gross profit----do----	18,232	(9,049)	108	14,127	1,976
General, selling, and administrative expenses 1,000 dollars--	15,391	13,844	14,039	14,374	12,956
Operating income or (loss) 1,000 dollars--	2,841	(22,893)	(13,931)	(247)	(10,980)
Interest expense 2/----do----	20	(334)	1,372	1,882	2,840
Other income or (expense) 2/ 1,000 dollars--	(1,230)	(792)	(164)	(1,296)	(3,885)
Net income or (loss) before income taxes 2/ 1,000 dollars--	1,591	(23,351)	(15,467)	(3,425)	(17,705)
Depreciation and amortization expense included above 1,000 dollars--	11,266	11,785	10,013	9,942	7,977
Cash flow from operations 3/ 1,000 dollars--	12,857	(11,566)	(5,454)	6,517	(9,728)
As a share of net sales:					
Cost of goods sold percent--	92.6	105.9	99.9	92.5	98.8
Gross profit or (loss) percent--	7.4	(5.8)	0.1	7.5	1.2
General, selling, and administrative expenses percent--	6.3	9.1	11.5	7.6	7.8
Operating income or (loss) percent--	1.2	(14.9)	(11.4)	(0.1)	(6.5)
Net income or (loss) before income taxes 2/--percent--	0.6	(15.2)	(12.6)	(1.7)	(10.5)
Number of firms reporting operating losses----	1	3	3	2	2
Number of firms reporting net losses----	1	3	3	2	2

1/ These firms accounted for * * * percent of reported U.S. production of axle parts in 1985.

2/ * * *, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on interest expenses and other income and expenses; hence, net income before taxes may be overstated or understated.

3/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table II-17.—Selected balance sheet and financial ratios of 4 U.S. producers 1/ of axle parts on their overall or divisional operations, as of the end of accounting years 1981-85

Item	1981	1982	1983	1984	1985
Total current assets 1,000 dollars	52,409	37,867	44,582	52,247	37,429
Property, plant, and equipment, net—1,000 dollars	100,623	97,986	87,767	83,469	77,020
Total assets—do	153,387	136,163	132,624	135,982	114,948
Total current liabilities 1,000 dollars	29,150	19,903	18,741	23,522	21,659
Long-term debt due after 1 year—1,000 dollars	532	460	4,112	3,054	1,062
Total liabilities—do	29,878	21,126	23,690	26,941	22,721
Equity—do	123,509	115,037	108,934	109,041	92,227
Working capital—do	23,259	17,964	25,841	28,725	15,770
Current ratio—times	1.80	1.90	2.38	2.22	1.73
Total debt to equity—do	0.24	0.18	0.22	0.25	0.25
Return on investment ratios:					
Pretax income or (loss) to—					
Equity—percent	1.3	(20.2)	(14.1)	(3.0)	(19.1)
Total assets—do	1.0	(17.0)	(11.6)	(2.4)	(15.3)
Invested capital 1/—do	1.3	(20.0)	(13.5)	(3.0)	(19.0)

1/ Invested capital is defined as working capital plus net property, plant, and equipment.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Capital expenditures and research and development expenses.—Three U.S. producers supplied data relative to their capital expenditures to comply with Government regulations and for building, machinery, and equipment used in the production of axle parts, and one U.S. producer provided data relative to its research and development expenses, as shown in the following tabulation (in thousands of dollars):

Year	Capital expenditures: Government regulations	Capital expenditures: Operations	Capital expenditures: Total	Research and development expenses
1981	***	***	***	***
1982	***	***	***	***
1983	***	***	117	***
1984	***	***	***	***
1985	***	***	479	***

Total capital expenditures declined from $*** in 1981 to $117,000 in 1983 and then rose to $479,000 in 1985. Capital expenditures to comply with Government regulations, such as the EPA and OSHA or other Government agencies, were $*** in 1982, $*** in 1983, and $*** in 1985. Research and development expenses increased irregularly from $*** in 1981 to $*** in 1984 and then dropped to $*** in 1985.

Financial experience of U.S. producers of levers.—Two producers of levers, which together accounted for * * * percent of reported production of levers in 1985, provided the Commission with usable financial information as presented below. 1/

Levers.—Only one U.S. producer of levers supplied usable income-and-loss data for 1981-85. Aggregate net sales of levers declined from $*** in 1981 to $*** in 1983, or by * * * percent, and then * * * to $*** in 1984 (table II-18). However, such sales dropped again to $*** in 1985, or by * * * percent.

The firm reported operating losses throughout the period of investigation, except in 1984. Such losses fluctuated between a low of $*** (* * * percent of sales) in 1985 to a high of $*** (* * * percent of sales) in 1982. The firm earned an operating income of $*** or * * * percent of sales in 1984. Pretax net income or loss margins followed a trend similar to the operating income or loss margins.

Cash flow from operations was negative during 1981-85. Such negative cash flow ranged between a low of $*** in 1984 and a high of $*** in 1982.

All steel castings.—Usable income-and-loss data were received from two U.S. producers of levers on their operations producing all steel castings for fiscal years 1981-85. Reported net sales of all steel castings by the responding U.S. producers fell from $*** million in 1981 to $*** million in 1983, or by * * * percent, and then increased by * * * percent to $*** million in 1984 (table II-19). However, such sales dropped to $*** million in 1985, or by * * * percent.

Aggregate operating losses were reported for all periods covered by the investigation. Such losses increased by * * * from $*** million, or * * * percent of sales, in 1981 to $*** million, or * * * percent of sales, in 1982, and then declined to $*** million, or * * * percent of sales, in 1984, before rising to $*** million, or * * * percent of net sales, in 1985. The pretax net loss margin followed the same trend as the operating loss margin.

Cash flow from operations was negative, ranging from a low of $*** million in 1984 to a high of $*** million in 1985, except in 1981 when the responding firms reported a positive cash flow of $*** million. Operating losses were sustained by both of the reporting firms during 1981-85, except in 1984 when only one firm sustained an operating loss.

1/ Neither of the reporting firms made special allocations to derive the data reported for their operations on all steel castings. The one firm reporting on its levers operations allocated manufacturing costs on the basis of tons produced and allocated GS&A expenses on the basis of cost of sales.

Table II-18.—Income-and-loss experience of 1 U.S. producer 1/ on its operations producing levers, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales————1,000 dollars——	***	***	***	***	***
Cost of goods sold————do————	***	***	***	***	***
Gross profit or (loss)—do————	***	***	***	***	***
General, selling, and administrative expenses 1,000 dollars——	***	***	***	***	***
Operating income or (loss) 1,000 dollars——	***	***	***	***	***
Interest expense————do————	***	***	***	***	***
Other income or (expense) 1,000 dollars——	***	***	***	***	***
Net income or (loss) before income taxes-1,000 dollars——	***	***	***	***	***
Depreciation and amortization expense————do————	***	***	***	***	***
Cash flow from operations 2/ 1,000 dollars——	***	***	***	***	***
As a share of net sales:					
Cost of goods sold percent——	***	***	***	***	***
Gross profit or (loss) percent——	***	***	***	***	***
General, selling, and administrative expenses percent——	***	***	***	***	***
Operating income or (loss) percent——	***	***	***	***	***
Net income or (loss) before income taxes————percent——	***	***	***	***	***

1/ This firm accounted for * * * percent of reported U.S. production in 1985.
2/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Total net sales of levers reported by the one firm that provided product line data (see table II-18) ranged between * * * and * * * percent of total net sales of its operations on all steel castings during 1981-85. The income-and-loss data on all steel castings operations of that firm are summarized in the following tabulation:

*   *   *   *   *   *   *

The above tabulation excludes the data for * * *, which reported large losses on its operations on all steel castings (see the tabulation in the

Table II-19.—Income-and-loss experience of 2 U.S. producers of levers 1/ on their operations producing all steel castings, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales----------1,000 dollars--:	***	***	***	***	***
Cost of goods sold----------do-----:	***	***	***	***	***
Gross profit--------------------do-----:	***	***	***	***	***
General, selling, and administrative expenses 1,000 dollars--:	***	***	***	***	***
Operating income or (loss) 1,000 dollars--:	***	***	***	***	***
Interest expense ----------do------:	***	***	***	***	***
Other income or (expense) 1,000 dollars--:	***	***	***	***	***
Net income or (loss) before income taxes 1,000 dollars--:	***	***	***	***	***
Depreciation and amortization expense included above 1,000 dollars--:	***	***	***	***	***
Cash flow from operations 2/ 1,000 dollars--:	***	***	***	***	***
As a share of net sales:					
Cost of goods sold percent--:	***	***	***	***	***
Gross profit or (loss) percent--:	***	***	***	***	***
General, selling, and administrative expenses percent--:	***	***	***	***	***
Operating income or (loss) percent--:	***	***	***	***	***
Net income or (loss) before income taxes -----percent--:	***	***	***	***	***
Number of firms reporting operating losses--------------------:	***	***	***	***	***
Number of firms reporting net losses--------------------------:	***	***	***	***	***

1/ These firms accounted for * * * percent of reported U.S. production of levers in 1985.

2/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

section on axle parts) and accounted for * * * percent of total net sales in 1985. If the data of * * * are excluded from the aggregate data in table II-19, operating loss margins of the remaining firm on its operations producing all steel castings for each period except 1984 would be much lower, as shown in the above tabulation.

Overall operations.—One U.S. producer of levers supplied financial data on its overall operations for accounting years 1981-85. Net sales declined annually from $*** million in 1981 to $*** million in 1983, or by * * * percent, and then increased to $*** million in 1984 (table II-20). Such sales dropped to $*** million in 1985. The firm reported operating losses for all periods, ranging from a low of $*** million, or * * * percent of sales, in 1981 to a high of $*** million, or * * * percent of sales, in 1985. Aggregate pretax net loss margins followed a trend similar to that of the operating loss margins.

Financial condition of U.S. producers.—Key balance sheet information and selected financial ratios of the one U.S. producer of levers that provided income-and-loss data on its overall operations are presented in table II-21.

The current ratio for the reporting producer increased irregularly from * * * in 1981 to * * * in 1984, and then dropped to * * * in 1985. A current ratio of more than 2.0 is normally considered to be strong. Aggregate working capital decreased from $*** million in 1981 to $*** million in 1982 and then rose to $*** million in 1984, before declining to $*** million in 1985. The net value of property, plant, and equipment dropped from $*** million in 1981 to $*** million in 1985. Total assets decreased irregularly by * * * percent during 1981-85. The ratio of debt to equity for the firm increased by * * * percent during 1981-83, and then dropped by * * * percent from 1983 to 1985. All of the different measures of return on investment showed similar negative trends, rising from 1981 to 1982, falling in 1983 and 1984, and then peaking in 1985.

Investment in property, plant, and equipment.—No U.S. producer provided data concerning its investment in facilities employed in the production of levers.

Capital expenditures and research and development expenses.—Only one U.S. producer supplied data relative to its capital expenditures for Government regulations and for building, machinery, and equipment used in the production of levers, and no U.S. producer provided data relative to its research and development expenses, as shown in the following tabulation (in thousands of dollars):

*   *   *   *   *   *   *

Financial experience of U.S. producers of drive sprockets.—Only one producer of drive sprockets, which accounted for * * * percent of reported production of drive sprockets in 1985, provided the Commission with usable financial information as presented below. 1/

1/ The responding firm made no special allocations in reporting data for its operations on all steel castings but, with respect to its drive sprockets operations, allocated manufacturing costs on the basis of tons produced and allocated GS&A expenses on the basis of cost of sales.

Table II-20.—Income-and-loss experience of 1 U.S. producer of levers 1/ on its overall operations, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales————1,000 dollars—:	***	***	***	***	***
Cost of goods sold————do———:	***	***	***	***	***
Gross profit——————do———:	***	***	***	***	***
General, selling, and administrative expenses 1,000 dollars—:	***	***	***	***	***
Operating income or (loss) 1,000 dollars—:	***	***	***	***	***
Interest expense ————do———:	***	***	***	***	***
Other income or (expense) 1,000 dollars—:	***	***	***	***	***
Net income or (loss) before income taxes 1,000 dollars—:	***	***	***	***	***
Depreciation and amortization expense included above 1,000 dollars—:	***	***	***	***	***
Cash flow from operations 2/ 1,000 dollars—:	***	***	***	***	***
As a share of net sales:					
Cost of goods sold percent—:	***	***	***	***	***
Gross profit or (loss) percent—:	***	***	***	***	***
General, selling, and administrative expenses percent—:	***	***	***	***	***
Operating income or (loss) percent—:	***	***	***	***	***
Net income or (loss) before income taxes ——percent—:	***	***	***	***	***

1/ This firm accounted for * * * percent of reported U.S. production of levers in 1985.

2/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table II-21.—Selected balance sheet and financial ratios of 1 U.S. producer 1/ of levers on its overall operations, as of the end of accounting years 1981-85

Item	1981	1982	1983	1984	1985
Total current assets 1,000 dollars	***	***	***	***	***
Property, plant, and equipment, net 1,000 dollars	***	***	***	***	***
Total assets do	***	***	***	***	***
Total current liabilities 1,000 dollars	***	***	***	***	***
Long-term debt due after 1 year 1,000 dollars	***	***	***	***	***
Total liabilities do	***	***	***	***	***
Equity do	***	***	***	***	***
Working capital do	***	***	***	***	***
Current ratio times	***	***	***	***	***
Total debt to equity do	***	***	***	***	***
Return on investment ratios:					
Pretax income or (loss) to—					
Equity percent	***	***	***	***	***
Total assets do	***	***	***	***	***
Invested capital 1/ do	***	***	***	***	***

1/ Invested capital is defined as working capital plus net property, plant, and equipment.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Drive sprockets.—The one responding U.S. producer's net sales * * * by * * * percent from $*** in 1981 to $*** in 1982 and then * * * by about * * * percent to $*** in 1983 and 1984 (table II-22). Such sales * * * by * * * percent to $*** in 1985 from that of 1984. The firm * * *. * * * peaked at $*** (* * * percent of net sales) in 1982 and then * * * to $*** (* * * percent of net sales) in 1985. The firm reported * * * of $***, equivalent to * * * percent of net sales, in 1981.

Cash flow from operations * * * from a * * * $*** in 1981 to a * * * $*** in 1982. Such * * * to $*** in 1985.

All steel castings and overall operations.—Usable income-and-loss data were received from one U.S. producer of drive sprockets on its operations producing all steel castings for fiscal years 1981-85. These data also represent the company's overall operations. Reported net sales of all steel castings by this producer * * * from $*** in 1981 to $*** in 1983, or by * * * percent, and then * * * by * * * percent to $*** in 1984 (table II-23). However, such sales * * * by * * * percent to $*** in 1985. Net sales of drive sprockets accounted for * * * to * * * percent of total net sales of all steel castings during 1981-85.

Table II-22.--Income-and-loss experience of 1 U.S. producer 1/ on its operations producing drive sprockets, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales------1,000 dollars---	***	***	***	***	***
Cost of goods sold------do------	***	***	***	***	***
Gross profit or (loss)---do------	***	***	***	***	***
General, selling, and administrative expenses 1,000 dollars---	***	***	***	***	***
Operating income or (loss) 1,000 dollars---	***	***	***	***	***
Interest expense------do------	***	***	***	***	***
Other income or (expense) 1,000 dollars---	***	***	***	***	***
Net income or (loss) before income taxes-1,000 dollars---	***	***	***	***	***
Depreciation and amortization expense included above 1,000 dollars---	***	***	***	***	***
Cash flow from operations 2/ 1,000 dollars---	***	***	***	***	***
As a share of net sales:					
Cost of goods sold percent---	***	***	***	***	***
Gross profit or (loss) percent---	***	***	***	***	***
General, selling, and administrative expenses percent---	***	***	***	***	***
Operating income or (loss) percent---	***	***	***	***	***
Net income or (loss) before income taxes------percent---	***	***	***	***	***

1/ This firm accounted for * * * percent of reported U.S. production in 1985.
2/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

The firm reported * * * during * * * except * * *. * * * were highest at $***, or *** percent of sales, in * * * and then * * * by * * * percent to $***, or * * * percent of sales, in 1983 and * * * to $*** in 1984 and 1985. The * * * were * * * percent and * * * percent in 1984 and 1985, respectively.

Table II-23.--Income-and-loss experience of 1 U.S. producer of drive sprockets 1/ on its operations producing all steel castings, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales:					
Trade----------1,000 dollars--:	***	***	***	***	***
Intra- and intercompany transfers--1,000 dollars--:	***	***	***	***	***
Total----------do---:	***	***	***	***	***
Cost of goods sold--------do-----:	***	***	***	***	***
Gross profit-------------do-----:	***	***	***	***	***
General, selling, and administrative expenses 1,000 dollars--:	***	***	***	***	***
Operating income or (loss) 1,000 dollars--:	***	***	***	***	***
Interest expense --------do-----:	***	***	***	***	***
Other income or (expense) 1,000 dollars--:	***	***	***	***	***
Net income or (loss) before income taxes 1,000 dollars--:	***	***	***	***	***
Depreciation and amortization expense included above 1,000 dollars--:	***	***	***	***	***
Cash flow from operations 2/ 1,000 dollars--:	***	***	***	***	***
As a share of net sales:					
Cost of goods sold percent--:	***	***	***	***	***
Gross profit or (loss) percent--:	***	***	***	***	***
General, selling, and administrative expenses percent--:	***	***	***	***	***
Operating income or (loss) percent--:	***	***	***	***	***
Net income or (loss) before income taxes ----percent--:	***	***	***	***	***
Ratio of drive sprockets net sales to all steel castings net sales-percent--:	***	***	***	***	***

1/ The firm, * * *, accounted for * * * percent of reported U.S. production of drive sprockets in 1985.

2/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Cash flow from operations turned from a * * * $*** in 1981 to a * * * $*** in 1982, and then * * * to $*** in 1984 and 1985.

Financial condition of U.S. producers.—Key balance sheet information and selected financial ratios of the one U.S. producer of drive sprockets that provided income-and-loss data on its overall operations are presented in table II-24.

The current ratio for the reporting producer * * * from * * * in 1981 to * * * in 1983, or by * * * percent, and then declined to * * * in 1985. A current ratio of more than 2.0 is normally considered to be strong. Aggregate working capital * * * from $*** in 1981 to $*** in 1985, or by * * * percent. The net value of property, plant, and equipment * * * from $*** in 1981 to $*** in 1982 and then * * * to $*** in 1985. Total assets * * * irregularly by * * * percent during 1981-85. The ratio of debt to equity for this firm * * * by * * * percent from 1981 to 1982 and then * * * from 1982 to 1985. All of the different measures of return on investment showed a similar trend, turning from a * * * in 1981 to a * * * return in 1982. Such * * * in 1983 and 1984, and then * * * again in 1985.

Investment in property, plant, and equipment.—One U.S. producer provided data concerning its investment in facilities employed in the production of drive sprockets. Such investment, valued at cost, * * * at $*** during 1981-85.

Financial experience of U.S. producers of beam hanger brackets.—Two producers of beam hanger brackets, which together accounted for * * * percent of reported production of beam hanger brackets in 1985, provided the Commission with usable financial information as presented below. 1/

Beam hanger brackets.—Aggregate net sales of beam hanger brackets declined from $*** in 1981 to $*** in 1983, or by * * * percent, and then increased annually to $*** in 1985, or by * * * percent (table II-25).

Aggregate operating losses were sustained during 1982-85, whereas an aggregate operating income of $***, or * * * percent of sales, was earned in 1981. Operating losses fell by * * * percent from $*** in 1982 to $*** in 1985; operating loss margins ranged between a low of * * * percent in 1982 to a high of * * * percent in 1983. Pretax net income and loss margins followed a trend similar to the operating income and loss margins.

Cash flow from operations was negative during 1982-85. Such negative cash flow decreased from $*** in 1982 to $*** in 1985, compared with a positive cash flow of $*** in 1981. Operating losses were reported by * * *.

1/ Neither of the reporting firms made special allocations to derive the data reported for their operations on all steel castings. One firm reporting on its beam hanger brackets operations allocated manufacturing costs on the basis of tons produced, whereas the other firm, which uses a standard cost system, allocated its variances on a production basis. Both firms allocated GS&A expenses on the basis of sales dollars.

Table II-24.—Selected balance sheet and financial ratios of 1 U.S. producer of drive sprockets on its overall operations, as of the end of accounting years 1981-85

Item	1981	1982	1983	1984	1985
Total current assets 1,000 dollars	***	***	***	***	***
Property, plant, and equipment, net—1,000 dollars	***	***	***	***	***
Total assets—do	***	***	***	***	***
Total current liabilities 1,000 dollars	***	***	***	***	***
Long-term debt due after 1 year—1,000 dollars	***	***	***	***	***
Total liabilities—do	***	***	***	***	***
Equity—do	***	***	***	***	***
Working capital—do	***	***	***	***	***
Current ratio—times	***	***	***	***	***
Total debt to equity—do	***	***	***	***	***
Return on investment ratios:					
Pretax income or (loss) (loss) to—					
Equity—percent	***	***	***	***	***
Total assets—do	***	***	***	***	***
Invested capital 1/—do	***	***	***	***	***

1/ Invested capital is defined as working capital plus net property, plant, and equipment.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

All steel castings.—Usable income-and-loss data were received from two U.S. producers of beam hanger brackets on their operations producing all steel castings for fiscal years 1981-85. Reported net sales of all steel castings by the responding U.S. producers fell from $*** in 1981 to $*** in 1983, or by * * * percent, and then increased by * * * percent to $*** in 1984 before declining to $*** in 1985 (table II-26). Net sales of beam hanger brackets accounted for * * * to * * * percent of total net sales of all steel castings during 1981-85.

The responding producers reported aggregate operating losses throughout the period of investigation. Such losses rose from $***, or * * * percent of sales, in 1981 to $***, or * * * percent of sales, in 1982 and then fell to $***, or * * * percent of sales, in 1984. Operating losses peaked at $***, or * * * percent of sales, in 1985.

Cash flow from operations turned from a positive $*** in 1981 to a negative $*** in 1982. Such negative cash flow fell to $*** in 1984 and then rose to $*** in 1985. Operating losses were sustained by * * *.

Table II-25.—Income-and-loss experience of 2 U.S. producers 1/ on their operations producing beam hanger brackets, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales——1,000 dollars——	***	***	***	***	***
Cost of goods sold——do——	***	***	***	***	***
Gross profit ——do——	***	***	***	***	***
General, selling, and administrative expenses 1,000 dollars——	***	***	***	***	***
Operating income or (loss) 1,000 dollars——	***	***	***	***	***
Interest expense 2/——do——	***	***	***	***	***
Other income or (expense) 2/ 1,000 dollars——	***	***	***	***	***
Net income or (loss) before income taxes 2/ 1,000 dollars——	***	***	***	***	***
Depreciation and amortization expense included above 1,000 dollars——	***	***	***	***	***
Cash flow from operations 3/ 1,000 dollars——	***	***	***	***	***
As a share of net sales:					
Cost of goods sold percent——	***	***	***	***	***
Gross profit or (loss) percent——	***	***	***	***	***
General, selling, and administrative expenses percent——	***	***	***	***	***
Operating income or (loss) percent——	***	***	***	***	***
Net income or (loss) before income taxes 2/——percent——	***	***	***	***	***
Number of firms reporting operating losses——	***	***	***	***	***
Number of firms reporting net losses——	***	***	***	***	***

1/ These firms accounted for * * * percent of reported U.S. production in 1985.
2/ * * *, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on interest expenses and other income and expenses; hence, net income before taxes may be overstated or understated.
3/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table II-26.—Income-and-loss experience of 2 U.S. producers of beam hanger brackets 1/ on their operations producing all steel castings, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales:					
Trade—1,000 dollars—	***	***	***	***	***
Intra- and intercompany transfers—1,000 dollars—	***	***	***	***	***
Total—do—	***	***	***	***	***
Cost of goods sold—do—	***	***	***	***	***
Gross profit—do—	***	***	***	***	***
General, selling, and administrative expenses 1,000 dollars—	***	***	***	***	***
Operating income or (loss) 1,000 dollars—	***	***	***	***	***
Interest expense 2/—do—	***	***	***	***	***
Other income or (expense) 2/ 1,000 dollars—	***	***	***	***	***
Net income or (loss) before income taxes 2/ 1,000 dollars—	***	***	***	***	***
Depreciation and amortization expense included above 1,000 dollars—	***	***	***	***	***
Cash flow from operations 3/ 1,000 dollars—	***	***	***	***	***
As a share of net sales:					
Cost of goods sold percent—	***	***	***	***	***
Gross profit or (loss) percent—	***	***	***	***	***
General, selling, and administrative expenses percent—	***	***	***	***	***
Operating income or (loss) percent—	***	***	***	***	***
Net income or (loss) before income taxes 2/—percent—	***	***	***	***	***
Number of firms reporting operating losses—	***	***	***	***	***
Number of firms reporting net losses—	***	***	***	***	***
Ratio of beam hanger brackets net sales to all steel castings net sales-percent—	***	***	***	***	***

1/ These firms accounted for * * * percent of reported U.S. production of beam hanger brackets in 1985.

2/ * * *, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on interest expenses and other income and expenses; hence, net income before taxes may be overstated or understated.

3/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

<u>Overall operations</u>.—Two U.S. producers of beam hanger brackets supplied financial data on their companies' overall or divisional operations for accounting years 1981-85. Net sales declined annually from $*** in 1981 to $*** in 1983, or by * * * percent, and then increased to $*** in 1984 before dropping to $*** in 1985 (table II-27). Aggregate operating losses were reported for all periods. Such losses rose about * * * from $*** in 1981 (* * * percent of net sales) to $*** in 1982 (* * * percent of net sales); such losses fell to $*** (* * * percent of net sales) in 1984 and then rose to $*** (* * * percent of net sales) in 1985. Aggregate pretax net loss margins followed a trend similar to that of the operating loss margins.

<u>Financial condition of U.S. producers</u>.—Key balance sheet information and selected financial ratios of the two U.S. producers of beam hanger brackets that provided income-and-loss data on their overall or divisional operations are presented in table II-28.

The current ratio for the reporting producers decreased from * * * in 1981 to * * * in 1982, or by * * * percent, and then rose to * * *, or by * * * percent, in 1984 before falling to * * * in 1985. A current ratio of more than 2.0 is normally considered to be strong. Aggregate working capital decreased from $*** in 1981 to $*** in 1982, or by * * * percent, and then * * * to $*** in 1984 before declining to $*** in 1985. The net value of property, plant, and equipment fell from $*** in 1981 to $*** in 1985. Total assets decreased by * * * percent during 1981-85. The ratio of debt to equity for the two firms fluctuated between * * * and * * * during 1981-85. All of the different measures of return on investment showed a similar negative return trend. Such negative return rose from 1981 to 1982, fell through 1984, and then peaked in 1985.

<u>Investment in property, plant, and equipment</u>.—Only one U.S. producer provided data concerning its investment in facilities employed in the production of beam hanger brackets. Such investment, valued at cost, remained at $*** during 1981-85.

<u>Capital expenditures and research and development expenses</u>.—Only one U.S. producer supplied data relative to its capital expenditures for building, machinery, and equipment used in the production of beam hanger brackets. Such machinery and equipment were also used for production of sockets and suspension brackets and other products. None of the U.S. producers provided data relative to their research and development expenses. Capital expenditures are shown in the following tabulation (in thousands of dollars):

* * * * * * *

Total capital expenditures increased from $*** in 1981 to $*** in 1982 and then fell irregularly to $*** in 1985. Capital expenditures to comply with Government regulations were * * * during 1981-85.

Table II-27.—Income-and-loss experience of 2 U.S. producers of beam hanger brackets 1/ on their companies' overall or divisional operations, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales--------1,000 dollars--	***	***	***	***	***
Cost of goods sold--------do------	***	***	***	***	***
Gross profit--------------do------	***	***	***	***	***
General, selling, and administrative expenses 1,000 dollars--	***	***	***	***	***
Operating income or (loss) 1,000 dollars--	***	***	***	***	***
Interest expense 2/--------do------	***	***	***	***	***
Other income or (expense) 2/ 1,000 dollars--	***	***	***	***	***
Net income or (loss) before income taxes 2/ 1,000 dollars--	***	***	***	***	***
Depreciation and amortization expense included above 1,000 dollars--	***	***	***	***	***
Cash flow from operations 3/ 1,000 dollars--	***	***	***	***	***
As a share of net sales:					
Cost of goods sold percent--	***	***	***	***	***
Gross profit or (loss) percent--	***	***	***	***	***
General, selling, and administrative expenses percent--	***	***	***	***	***
Operating income or (loss) percent--	***	***	***	***	***
Net income or (loss) before income taxes 2/--percent--	***	***	***	***	***
Number of firms reporting operating losses--------------	***	***	***	***	***
Number of firms reporting net losses--------------------	***	***	***	***	***

1/ These firms accounted for * * * percent of reported U.S. production of beam hanger brackets in 1985.

2/ * * *, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on interest expenses and other income and expenses; hence, net income before taxes may be overstated or understated.

3/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table II-28.—Selected balance sheet and financial ratios of 2 U.S. producers 1/ of beam hanger brackets on their overall or divisional operations, as of the end of accounting years 1981-85

Item	1981	1982	1983	1984	1985
Total current assets 1,000 dollars	***	***	***	***	***
Property, plant, and equipment, net—1,000 dollars	***	***	***	***	***
Total assets—do	***	***	***	***	***
Total current liabilities 1,000 dollars	***	***	***	***	***
Long-term debt due after 1 year—1,000 dollars	***	***	***	***	***
Total liabilities—do	***	***	***	***	***
Equity—do	***	***	***	***	***
Working capital—do	***	***	***	***	***
Current ratio—times	***	***	***	***	***
Total debt to equity—do	***	***	***	***	***
Return on investment ratios:					
Pretax income or (loss) to—					
Equity—percent	***	***	***	***	***
Total assets—do	***	***	***	***	***
Invested capital 1/—do	***	***	***	***	***

1/ Invested capital is defined as working capital plus net property, plant, and equipment.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Financial experience of U.S. producers of sockets and suspension brackets.—Two producers of sockets and suspension brackets, which together accounted for 100 percent of reported production of sockets and suspension brackets in 1985, provided the Commission with usable financial information as presented below. 1/

Sockets and suspension brackets.—Aggregate net sales of sockets and suspension brackets declined from $*** in 1981 to $*** in 1983, or by * * * percent, and then increased to $*** in 1984, or by * * * percent, before dropping to $*** in 1985 (table II-29).

1/ Neither of the reporting firms made special allocations to derive the data reported for their operations on all steel castings. One firm reporting on its sockets and suspension brackets operations allocated manufacturing costs on the basis of tons produced, whereas the other firm, which uses a standard cost system, allocated its variances on a production basis. Both firms allocated GS&A expenses on the basis of sales dollars.

Table II-29.--Income-and-loss experience of 2 U.S. producers 1/ on their operations producing sockets and suspension brackets, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales-----1,000 dollars--	***	***	***	***	***
Cost of goods sold-----do-----	***	***	***	***	***
Gross profit-----do-----	***	***	***	***	***
General, selling, and administrative expenses 1,000 dollars--	***	***	***	***	***
Operating income or (loss) 1,000 dollars--	***	***	***	***	***
Interest expense 2/-----do-----	***	***	***	***	***
Other income or (expense) 2/ 1,000 dollars--	***	***	***	***	***
Net income or (loss) before income taxes 2/ 1,000 dollars--	***	***	***	***	***
Depreciation and amortization expense included above 1,000 dollars--	***	***	***	***	***
Cash flow from operations 3/ 1,000 dollars--	***	***	***	***	***
As a share of net sales:					
Cost of goods sold percent--	***	***	***	***	***
Gross profit or (loss) percent--	***	***	***	***	***
General, selling, and administrative expenses percent--	***	***	***	***	***
Operating income or (loss) percent--	***	***	***	***	***
Net income or (loss) before income taxes 2/--percent--	***	***	***	***	***
Number of firms reporting operating losses-----	***	***	***	***	***
Number of firms reporting net losses-----	***	***	***	***	***

1/ These firms accounted for 100 percent of reported U.S. production in 1985.

2/ * * *, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on interest expenses and other income and expenses; hence, net income before taxes may be overstated or understated.

3/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

The responding producers reported aggregate operating losses throughout the period under investigation. Aggregate operating losses rose by more than * * * from $***, or * * * percent of sales, in 1981 to $***, or * * * percent of sales, in 1984. In 1985, an operating loss of $*** or * * * percent of sales was sustained. Pretax net loss margins followed a trend similar to the operating loss margins.

Cash flow from operations was negative in each period. Such negative cash flow increased from $*** in 1981 to $*** in 1984 and then decreased to $*** in 1985. * * *.

All steel castings.—Usable income-and-loss data were received from two U.S. producers of sockets and suspension brackets on their operations producing all steel castings for fiscal years 1981-85. Reported net sales of all steel castings by the responding U.S. producers fell from $*** in 1981 to $*** in 1983, or by * * * percent, and then increased by * * * percent to $*** in 1984 before declining to $*** in 1985 (table II-30). Net sales of sockets and suspension brackets accounted for less than * * * percent of total net sales of all steel castings during 1981-85.

The responding producers reported aggregate operating losses throughout the period of investigation. Such losses rose from $***, or * * * percent of sales, in 1981 to $***, or * * * percent of sales, in 1982 and then fell to $***, or * * * percent of sales, in 1984. Operating losses peaked at $***, or * * * percent of sales, in 1985.

Cash flow from operations turned from a positive $*** in 1981 to a negative $*** in 1982. Such negative cash flow fell to $*** in 1984 and then rose to $*** in 1985. * * *.

Overall operations.—Two U.S. producers of sockets and suspension brackets supplied financial data on their companies' overall or divisional operations for accounting years 1981-85. Net sales declined annually from $*** in 1981 to $*** in 1983, or by * * * percent, and then increased to $*** in 1984 before dropping to $*** in 1985 (table II-31). Aggregate operating losses were reported for all periods. Such losses rose about * * * from $*** in 1981 (* * * percent of net sales) to $*** in 1982 (* * * percent of net sales); such losses fell to $*** (* * * percent of net sales) in 1984 and then rose to $*** (* * * percent of net sales) in 1985. Aggregate pretax net loss margins followed a trend similar to that of the operating loss margins.

Financial condition of U.S. producers.—Key balance sheet information and selected financial ratios of the two U.S. producers of sockets and suspension brackets that provided income-and-loss data on their overall or divisional operations are presented in table II-32.

The current ratio for the reporting producers decreased from * * * in 1981 to * * * in 1982, or by * * * percent, and then rose to * * *, or by * * * percent, in 1984 before falling to * * * in 1985. A current ratio of more than 2.0 is normally considered to be strong. Aggregate working capital decreased from $*** in 1981 to $*** in 1982, or by * * * percent, and then * * * to $*** in 1984 before declining to $*** in 1985. The net value of property, plant, and equipment fell from $*** in 1981 to $*** in 1985. Total

Table II-30.—Income-and-loss experience of 2 U.S. producers of sockets and suspension brackets 1/ on their operations producing all steel castings, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales:					
Trade—1,000 dollars	***	***	***	***	***
Intra- and intercompany transfers—1,000 dollars	***	***	***	***	***
Total—do	***	***	***	***	***
Cost of goods sold—do	***	***	***	***	***
Gross profit—do	***	***	***	***	***
General, selling, and administrative expenses 1,000 dollars	***	***	***	***	***
Operating income or (loss) 1,000 dollars	***	***	***	***	***
Interest expense 2/—do	***	***	***	***	***
Other income or (expense) 2/ 1,000 dollars	***	***	***	***	***
Net income or (loss) before income taxes 2/ 1,000 dollars	***	***	***	***	***
Depreciation and amortization expense included above 1,000 dollars	***	***	***	***	***
Cash flow from operations 3/ 1,000 dollars	***	***	***	***	***
As a share of net sales:					
Cost of goods sold percent	***	***	***	***	***
Gross profit or (loss) percent	***	***	***	***	***
General, selling, and administrative expenses percent	***	***	***	***	***
Operating income or (loss) percent	***	***	***	***	***
Net income or (loss) before income taxes 2/—percent	***	***	***	***	***
Number of firms reporting operating losses	***	***	***	***	***
Number of firms reporting net losses	***	***	***	***	***
Ratio of sockets and suspension brackets net sales to all steel castings net sales—percent	***	***	***	***	***

1/ These firms accounted for 100 percent of reported U.S. production of sockets and suspension brackets in 1985.

2/ * * *, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on interest expenses and other income and expenses; hence, net income before taxes may be overstated or understated.

3/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table II-31.--Income-and-loss experience of 2 U.S. producers of sockets and suspension brackets 1/ on their companies' overall or divisional operations, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales--------1,000 dollars--	***	***	***	***	***
Cost of goods sold--------do------	***	***	***	***	***
Gross profit-----------------do-----	***	***	***	***	***
General, selling, and administrative expenses 1,000 dollars--	***	***	***	***	***
Operating income or (loss) 1,000 dollars--	***	***	***	***	***
Interest expense 2/--------do------	***	***	***	***	***
Other income or (expense) 2/ 1,000 dollars--	***	***	***	***	***
Net income or (loss) before income taxes 2/ 1,000 dollars--	***	***	***	***	***
Depreciation and amortization expense included above 1,000 dollars--	***	***	***	***	***
Cash flow from operations 3/ 1,000 dollars--	***	***	***	***	***
As a share of net sales:					
Cost of goods sold percent--	***	***	***	***	***
Gross profit or (loss) percent--	***	***	***	***	***
General, selling, and administrative expenses percent--	***	***	***	***	***
Operating income or (loss) percent--	***	***	***	***	***
Net income or (loss) before income taxes 2/--percent--	***	***	***	***	***
Number of firms reporting operating losses-----------------	***	***	***	***	***
Number of firms reporting net losses----------------------	***	***	***	***	***

1/ These firms accounted for 100 percent of reported U.S. production of sockets and suspension brackets in 1985.

2/ * * *, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on interest expenses and other income and expenses; hence, net income before taxes may be overstated or understated.

3/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table II-32.—Selected balance sheet and financial ratios of 2 U.S. producers 1/ of sockets and suspension brackets on their overall or divisional operations, as of the end of accounting years 1981-85

Item	1981	1982	1983	1984	1985
Total current assets 1,000 dollars	***	***	***	***	***
Property, plant, and equipment, net——1,000 dollars	***	***	***	***	***
Total assets——do	***	***	***	***	***
Total current liabilities 1,000 dollars	***	***	***	***	***
Long-term debt due after 1 year——1,000 dollars	***	***	***	***	***
Total liabilities——do	***	***	***	***	***
Equity——do	***	***	***	***	***
Working capital——do	***	***	***	***	***
Current ratio——times	***	***	***	***	***
Total debt to equity——do	***	***	***	***	***
Return on investment ratios:					
Pretax income or (loss) to—					
Equity——percent	***	***	***	***	***
Total assets——do	***	***	***	***	***
Invested capital 1/—do	***	***	***	***	***

1/ Invested capital is defined as working capital plus net property, plant, and equipment.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

assets decreased by * * * percent during 1981-85. The ratio of debt to equity for the two firms fluctuated between * * * and * * * during 1981-85. All of the different measures of return on investment showed a similar negative return trend. Such negative return rose from 1981 to 1982, fell through 1984, and then peaked in 1985.

Investment in property, plant, and equipment.—Only one U.S. producer provided data concerning its investment in facilities employed in the production of sockets and suspension brackets. Such investment, valued at cost, * * * $*** during 1981-85.

Capital expenditures and research and development expenses.—Only one U.S. producer supplied data relative to its capital expenditures for building, machinery, and equipment used in the production of sockets and suspension brackets. Such machinery and equipment were also used for the production of * * *. None of the U.S. producers provided data relative to their research and development expenses. Capital expenditures are shown in the following tabulation (in thousands of dollars):

*   *   *   *   *   *   *

Total capital expenditures increased from $*** in 1981 to $*** in 1982 and then fell irregularly to $*** in 1985. Capital expenditures to comply with Government regulations were * * * during 1981-85.

Financial experience of U.S. producers of parts of valves.—Twelve producers of parts of valves, which together accounted for * * * percent of reported production of valve parts in 1985, provided the Commission with usable financial information as presented below. 1/

Parts of valves.—Eleven U.S. producers of parts of valves supplied usable income-and-loss data for 1981-85. Aggregate net sales of parts of valves declined from $96.5 million in 1981 to $47.5 million in 1983, or by 51 percent, and then increased to $49.3 million in 1985, or by 4 percent (table II-33).

Aggregate operating income dropped precipitously by 99 percent from $7.4 million, or 7.7 percent of sales, in 1981 to $81,000, or 0.1 percent of sales, in 1982. In 1983 and 1985, operating losses of $3.7 million, equivalent to about 7.5 percent of sales, were incurred. Such loss was down by one-third to $2.4 million, or 4.9 percent of sales, in 1984. The majority of the large "other expense" item in 1984 reflects * * *. Pretax net income and loss margins generally followed a trend similar to the operating income and loss margins except that in 1982 a net loss was experienced compared with an operating income and in 1984 the net loss was significantly more severe than the operating loss. In 1985, one firm, * * *, reported $*** in its * * *.

Cash flow from operations decreased from $9.0 million in 1981 to $1.9 million in 1982 and then turned to a negative cash flow that peaked at $7.8 million in 1984. Operating losses were reported by 1 of the 11 firms in 1981, 4 firms in 1982 and 1984, 7 firms in 1983, and 5 firms in 1985.

One firm, * * *, which accounted for * * * percent of reported U.S. production in 1985, is a captive foundry. All sales are transferred to other divisions at standard cost. The * * * reported for all periods represent * * * which indicate that * * *. Hence, this company's data were not included in the aggregate data in tables II-33 and II-34.

All steel castings.—Usable income-and-loss data were received from 12 U.S. producers of parts of valves on their operations producing all steel castings for fiscal years 1981-85. Reported net sales of all steel castings by the responding U.S. producers fell from $280.1 million in 1981 to $141.2 million in 1983, or by 50 percent, and then increased by 27 percent to $179.1 million in 1985 (table II-34).

1/ Two firms' data are the same for parts of valves and all steel castings because valve castings is their principal cast-steel product. Six of the 12 firms made no special allocations to develop their data on all steel castings operations, 1 firm allocated its GS&A expenses only, and the remaining 3 firms used tons produced as a basis for allocating manufacturing costs. Two of the 11 firms reporting data on their operations producing parts of valves employ a standard cost system and, consequently, allocated variances only; the remaining 7 firms allocated manufacturing costs on the basis of tons produced. Most of the firms used sales dollars as a basis for allocating GS&A expenses.

Table II-33.—Income-and-loss experience of 11 U.S. producers 1/ on their operations producing parts of valves, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales:					
Trade—1,000 dollars—	66,920	56,142	31,662	***	35,357
Intra- and intercompany transfers—1,000 dollars—	29,604	23,835	15,816	***	13,913
Total—do—	96,524	79,977	47,478	48,226	49,270
Cost of goods sold—do—	82,924	73,803	45,390	45,801	48,811
Gross profit—do—	13,600	6,174	2,088	2,425	459
General, selling, and administrative expenses 1,000 dollars—	6,208	6,093	5,746	4,840	4,208
Operating income or (loss) 1,000 dollars—	7,392	81	(3,658)	(2,415)	(3,749)
Interest expense 2/—do—	(60)	259	53	87	1
Other income or (expense) 2/ 1,000 dollars—	(324)	96	227	(6,859)	(130)
Net income or (loss) before income taxes 2/ 1,000 dollars—	7,128	(82)	(3,484)	(9,361)	(3,880)
Depreciation and amortization expense included above 3/ 1,000 dollars—	1,846	1,963	1,719	1,571	1,767
Cash flow from operations 4/ 1,000 dollars—	8,974	1,881	(1,765)	(7,790)	(2,113)
As a share of net sales:					
Cost of goods sold percent—	85.9	92.3	95.6	95.0	99.1
Gross profit or (loss) percent—	14.1	7.7	4.4	5.0	0.9
General, selling, and administrative expenses percent—	6.4	7.6	12.1	10.0	8.5
Operating income or (loss) percent—	7.7	0.1	(7.6)	(4.9)	(7.5)
Net income or (loss) before income taxes 2/—percent—	7.4	-	(7.2)	(19.3)	(7.8)
Number of firms reporting operating losses—	1	4	7	4	5
Number of firms reporting net losses—	0	3	7	6	6

1/ These firms accounted for * * * percent of reported U.S. production in 1985.
2/ * * *, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on interest expenses and other income and expenses; hence, net income before taxes may be overstated or understated.
3/ * * *, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on depreciation and amortization.
4/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table II-34.—Income-and-loss experience of 12 U.S. producers of parts of valves 1/ on their operations producing all steel castings, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales:					
Trade—1,000 dollars—	228,513	181,690	114,238	154,823	152,152
Intra- and intercompany transfers—1,000 dollars—	51,610	43,515	26,912	29,420	26,907
Total—do—	280,123	225,205	141,150	184,243	179,059
Cost of goods sold—do—	244,122	204,829	138,818	169,136	165,879
Gross profit—do—	36,001	20,376	2,332	15,107	13,180
General, selling, and administrative expenses 1,000 dollars—	19,670	19,200	16,495	15,550	14,622
Operating income or (loss) 1,000 dollars—	16,331	1,176	(14,163)	(443)	(1,442)
Interest expense 2/—do—	1,396	3,279	2,094	3,224	2,082
Other income or (expense) 2/ 1,000 dollars—	(1,831)	(915)	(8)	(7,855)	(1,090)
Net income or (loss) before income taxes 2/ 1,000 dollars—	13,104	(3,018)	(16,265)	(11,522)	(4,614)
Depreciation and amortization expense included above 3/ 1,000 dollars—	7,033	7,570	6,921	7,067	6,650
Cash flow from operations 4/ 1,000 dollars—	20,137	4,552	(9,344)	(4,455)	2,036
As a share of net sales:					
Cost of goods sold percent—	87.1	91.0	98.3	91.8	92.6
Gross profit or (loss) percent—	12.9	9.0	1.7	8.2	7.4
General, selling, and administrative expenses percent—	7.0	8.5	11.7	8.4	8.2
Operating income or (loss) percent—	5.8	0.5	(9.9)	(0.1)	(0.7)
Net income or (loss) before income taxes 2/—percent—	4.7	(1.2)	(11.4)	(6.2)	(2.5)
Number of firms reporting operating losses—	2	6	9	7	8
Number of firms reporting net losses—	1	5	9	9	9

1/ These firms accounted for * * * percent of reported U.S. production of parts of valves in 1985.

2/ * * *, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on interest expenses and other income and expenses; hence, net income before taxes may be overstated or understated.

3/ * * *, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on depreciation and amortization.

4/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Aggregate operating income plunged by 93 percent from $16.3 million, or 5.8 percent of sales, in 1981 to $1.2 million, or 0.5 percent of sales, in 1982. In 1983, the responding producers reported a large aggregate operating loss of $14.2 million, or 9.9 percent of sales. Such loss declined to $443,000, or 0.1 percent of net sales, in 1984 and $1.4 million, or 0.7 percent of sales, in 1985. In 1984, * * *. The pretax net income and loss margins generally followed the same trend as the operating income and loss margins except that in 1982 a net loss was experienced compared with an operating income and in 1984 the net loss was significantly more severe than the operating loss.

Cash flow from operations declined from $20.1 million in 1981 to $4.6 million in 1982 and then turned to a negative cash flow during 1983-84. Such negative cash flow fell from $9.3 million in 1983 to $4.5 million in 1984. A positive cash flow of $2.0 million was reported in 1985. Operating losses were sustained by 2 of the 12 reporting firms in 1981, 6 firms in 1982, 9 firms in 1983, 7 firms in 1984, and 8 firms in 1985.

Total net sales of parts of valves reported by 11 firms that provided product line data (see table II-33) ranged between 28 and 37 percent of total net sales of their operations on all steel castings during 1981-85. The income-and-loss data on all steel castings operations of those 11 firms are summarized in the following tabulation:

* * * * * * *

<u>Overall operations</u>.—Eleven U.S. producers of parts of valves supplied financial data on their companies' overall or divisional operations for accounting years 1981-85. Net sales declined annually from $452.3 million in 1981 to $311.2 million in 1983, or by 31 percent, and then increased to $352.6 million in 1985 (table II-35). Aggregate operating income, which dropped faster than net sales, fell by 88 percent from $49.5 million in 1981 (10.9 percent of net sales) to $6.0 million in 1983 (1.9 percent of net sales); such income rose to $12.0 million (3.3 percent of net sales) in 1984 and to $19.1 million (5.4 percent of net sales) in 1985. Aggregate pretax net income margins followed a trend similar to that of the operating income margins, except in 1984 a net loss margin of 0.2 was reported because of * * *.

<u>Financial condition of U.S. producers</u>.—Key balance sheet information and selected financial ratios of the 11 U.S. producers of parts of valves that provided income-and-loss data on their overall or divisional operations are presented in table II-36.

The current ratio for the reporting producers increased from 2.65 in 1981 to 2.94 in 1983, or by 11 percent, and then fell to 2.83 in 1985. A current ratio of more than 2.0 is normally considered to be strong. Aggregate working capital decreased irregularly from $111.0 million in 1981 to $93.0 million in 1985, or by 16 percent. The net value of property, plant, and equipment rose from $111.9 million in 1981 to $122.5 million in 1983 and then dropped to $114.2 million in 1985. Total assets decreased irregularly by 11 percent during 1981-85. The ratio of debt to equity for the 11 firms declined by 8 percent from 1981 to 1982, increased by 30 percent from 1982 to 1984, and fell by 12 percent in 1985. All of the different measures of return on investment showed a similar trend, declining from 1981 to 1983, turning to negative in 1984, and then rising in 1985 to positive levels below those experienced in 1981 and 1982.

Table II-35.—Income-and-loss experience of 11 U.S. producers of parts of valves 1/ on their companies' overall or divisional operations, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales——1,000 dollars—:	452,276	393,408	311,193	366,949	352,644
Cost of goods sold——do——:	343,277	308,103	247,296	292,395	274,031
Gross profit——do——:	108,999	85,305	63,897	74,554	78,613
General, selling, and administrative expenses 1,000 dollars—:	59,543	59,545	57,935	62,525	59,529
Operating income or (loss) 1,000 dollars—:	49,456	25,760	5,962	12,029	19,084
Interest expense 2/——do——:	4,036	5,555	4,168	4,083	4,216
Other income or (expense) 2/ 1,000 dollars—:	(3,348)	(1,980)	(1,247)	(9,179)	(2,665)
Net income or (loss) before income taxes 2/ 1,000 dollars—:	42,072	18,225	547	(1,233)	12,203
Depreciation and amortization expense included above 3/ 1,000 dollars—:	11,521	12,448	12,340	13,607	13,934
Cash flow from operations 4/ 1,000 dollars—:	53,593	30,673	12,887	12,374	26,137
As a share of net sales:					
Cost of goods sold percent—:	75.9	78.3	79.5	79.7	77.7
Gross profit or (loss) percent—:	24.1	21.7	20.5	20.3	22.3
General, selling, and administrative expenses percent—:	13.2	15.1	18.6	17.0	16.9
Operating income or (loss) percent—:	10.9	6.5	1.9	3.3	5.4
Net income or (loss) before income taxes 2/—percent—:	9.3	4.6	0.2	(0.2)	3.5
Number of firms reporting operating losses——:	1	4	7	6	5
Number of firms reporting net losses——:	0	3	7	8	7

1/ These firms accounted for * * * percent of reported U.S. production of parts of valves in 1985.

2/ * * *, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on interest expenses and other income and expenses; hence, net income before taxes may be overstated or understated.

3/ * * *, which accounted for * * * percent of reported 1985 net sales, did not provide the Commission with data on depreciation and amortization.

4/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table II-36.—Selected balance sheet and financial ratios of 11 U.S. producers 1/ of parts of valves on their overall or divisional operations, as of the end of accounting years 1981-85

Item	1981	1982	1983	1984	1985
Total current assets 1,000 dollars	178,424	152,226	167,682	166,654	143,732
Property, plant, and equipment, net—1,000 dollars	111,913	115,650	122,451	118,188	114,248
Total assets—do	298,064	275,355	298,258	292,964	265,868
Total current liabilities 1,000 dollars	67,444	52,922	57,025	64,670	50,775
Long-term debt due after 1 year—1,000 dollars	22,105	25,120	23,981	24,848	21,236
Total liabilities—do	96,268	84,265	97,720	106,941	88,473
Equity—do	201,796	191,090	200,538	186,023	177,395
Working capital—do	110,980	99,304	110,657	101,984	92,957
Current ratio—times	2.65	2.88	2.94	2.58	2.83
Total debt to equity—do	0.48	0.44	0.49	0.57	0.50
Return on investment ratios:					
Pretax income or (loss) to—					
Equity—percent	20.8	9.5	0.3	(0.6)	6.9
Total assets—do	14.1	6.6	0.2	(0.3)	4.6
Invested capital 1/—do	18.9	8.5	0.2	(0.5)	5.9

1/ Invested capital is defined as working capital plus net property, plant, and equipment.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Investment in property, plant, and equipment.—Five U.S. producers provided data concerning their investment in facilities employed in the production of parts of valves, as presented in the following tabulation (in thousands of dollars):

Year	Original Cost	Book Value
1981	23,049	11,038
1982	24,734	10,740
1983	24,661	9,617
1984	23,971	8,018
1985	23,473	7,371

Aggregate investment in productive facilities, valued at cost, increased from $23.0 million in 1981 to $24.7 million in 1982 and then declined steadily to $23.5 million in 1985. The book value of such facilities generally followed the same trend as the original cost of investment.

Capital expenditures and research and development expenses.—Seven U.S. producers supplied data relative to their capital expenditures to comply with Government regulations and for building, machinery, and equipment used in the production of parts of valves, and three U.S. producers provided data relative to their research and development expenses, as shown in the following tabulation (in thousands of dollars):

Year	Capital expenditures: Government regulations	Capital expenditures: Operations	Capital expenditures: Total	Research and development expenses
1981	***	***	***	***
1982	***	***	***	***
1983	***	***	2,367	***
1984	***	***	2,585	***
1985	***	***	2,399	***

Total capital expenditures rose from $*** in 1981 to $*** in 1982 and then fell irregularly to $2.3 million in 1985. Capital expenditures to comply with Government regulations dropped from $*** in 1981 to $*** in 1983 before rising to $*** in 1984 and to $*** in 1985. Research and development expenses increased irregularly from $*** in 1981 to $*** in 1985.

Summary of operating income-and-loss data.—The ratios of operating income or loss to net sales reported by U.S. producers of the six steel products subject to this investigation and such producers' overall steel castings operations and overall company or divisional operations are summarized in table II-37. For comparison, data are also presented for the comparable profitability ratios compiled by the Bureau of the Census for all manufacturing companies, all durable goods producers, and all producers of iron and steel products, and by Robert Morris Associates for all iron and steel foundries.

The Question of Threat of Serious Injury

Foreign producers

Parts for construction equipment, tractors, and trucks.—Reported foreign sources of U.S. imports of axle parts, levers, drive sprockets, beam hanger brackets, and sockets and suspension brackets are marked by "X" in the following tabulation:

Table II-37.—Ratios of operating income or loss to net sales for all manufacturing firms, all producers of durable goods, iron and steel producers, iron and steel foundries, and producers of certain steel castings subject to this investigation, accounting years 1981-85

(In percent)

Item	1981	1982	1983	1984	1985
All manufacturing firms 1/	6.7	5.1	5.9	6.8	5.9
Manufacturers of durable goods 1/	6.5	4.1	5.0	6.6	5.4
Iron & steel (ESIC33.1-2) 1/	5.9	(4.3)	(1.5)	2.6	0.6
Iron & steel foundries (SIC Nos. 3321-22,24,25) 2/	6.4	0.2	(1.9)	4.4	3/
Producers of axle parts on their operations on—					
Axle parts	(0.2)	(14.6)	(12.6)	8.7	(2.9)
All steel castings	(0.2)	(16.7)	(16.2)	(2.7)	(10.3)
Overall companies or divisions	1.2	(14.9)	(11.4)	(0.1)	(6.5)
Producers of levers on their operations on—					
Levers	***	***	***	***	***
All steel castings	***	***	***	***	***
Overall companies or divisions	***	***	***	***	***
Producers of drive sprockets on their operations on—					
Drive sprockets	***	***	***	***	***
All steel castings as well as overall companies or divisions	***	***	***	***	***
Producers of beam hanger brackets on their operations on—					
Beam hanger brackets	***	***	***	***	***
All steel castings	***	***	***	***	***
Overall companies or divisions	***	***	***	***	***
Producers of sockets and suspension brackets on their operations on—					
Sockets and suspension brackets	***	***	***	***	***
All steel castings	***	***	***	***	***
Overall companies or divisions	***	***	***	***	***
Producers of parts of valves on their operations on—					
Parts of valves	7.7	0.1	(7.6)	(4.9)	(7.5)
All steel castings	5.8	0.5	(9.9)	(0.1)	(0.7)
Overall companies or divisions	10.9	6.5	1.9	3.3	5.4

1/ Derived from data published in Quarterly Financial Reports for Manufacturing, Mining, and Trade Corporations, Bureau of the Census.
2/ Compiled from 1985 Annual Statements Studies, Robert Morris Associates.
3/ Not available.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission, except as noted.

Source	Axle parts	Levers	Drive sprockets	Beam hanger brackets	Sockets and suspension brackets
Argentina					X
Brazil				X	
Canada				X	
France		X			
Italy	X		X		
Japan	X	X	X	X	
Spain	X		X	X	
United Kingdom	X				
West Germany			X		

There are no reported U.S. imports of the subject products from countries other than those listed above. Foreign producers allegedly producing the subject products for export to the United States include, according to industry sources, Hitachi (Japan) and Aranzabal (Spain) for axle housings; Sambre-et-Meuse (France) for levers; and Combrasa (Brazil), Aranzabal (Spain), and Nissho Iwai (Japan) for beam hanger brackets. 1/

Parts of valves.—At least 12 countries are known to export cast-steel parts of valves to the United States. The principal countries are Canada, Japan, Portugal, the Republic of Korea, and Spain.

Information on exporting countries' production, home-market shipments, total exports, and exports to the United States of the subject cast-steel products is presented in the introductory section of this report.

U.S. importers' inventories of imported steel castings

U.S. importers' inventories of imported steel castings are presented in table II-38.

Inventories of axle parts fluctuated during yearend 1981-84, then increased in yearend 1985. Inventories of drive sprockets increased as of the end of each year during 1981-85. There were no clear trends in inventories of imported beam hanger brackets and parts of valves. There were no inventories of levers * * *, and no inventories of sockets and suspension brackets during yearend 1981-85.

For axle parts, yearend inventories as a share of U.S. imports in the previous year were low throughout 1981-85, but increased in each year except for 1984. The inventory ratio for levers decreased in 1985. The inventory ratio for drive sprockets was sizable, and increased in each year except 1983. For beam hanger brackets, the inventory ratio ranged from a high of * * * percent in 1981 to a low of * * * percent in 1984. The inventory ratio for parts of valves fluctuated with no clear trend.

1/ Based on statements by industry officials * * *.

Table II-38.—Certain steel castings: U.S. importers' yearend inventories, by types

Product	1981	1982	1983	1984	1985
	Quantity (tons)				
Axle parts	***	***	***	***	***
Levers	0	0	0	***	***
Drive sprockets	233	258	288	456	458
Beam hanger brackets	***	***	***	***	***
Sockets and suspension brackets	0	0	0	0	0
Parts of valves	2,266	2,744	1,620	1,100	1,775
	Share of U.S. imports (percent)				
Axle parts	***	***	***	***	***
Levers	–	–	–	***	***
Drive sprockets	28.4	35.0	32.1	43.0	51.9
Beam hanger brackets	***	***	***	***	***
Sockets and suspension brackets	–	–	–	–	–
Parts of valves	26.5	22.7	37.7	14.1	19.9

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

The Question of Imports as a Substantial Cause of Serious Injury or the Threat Thereof

Market penetration

U.S. imports of the subject steel castings as a share of apparent U.S. consumption are shown in table II-39. The ratios of imports to consumption for each of six cast-steel products were higher in 1985 than in 1981. The ratio for axle parts decreased in 1982 and then increased each year during 1983-85, reaching a high of 13.4 percent in 1985. The ratios for levers and sockets and suspension brackets were minimal during 1981-84, then increased significantly in 1985, amounting to * * * percent in that year for levers and 25.3 percent for sockets and suspension brackets. The ratio for drive sprockets ranged from a low of * * * percent in 1981 1/ to a high of * * * percent in 1982. The ratio for beam hanger brackets increased from a low of * * * percent in 1981 to a high of * * * percent in 1983, and then declined to 77.2 percent in 1985. The ratio for parts of valves increased irregularly from a low of 15.6 percent in 1981 to a high of 28.6 percent in 1984, before dropping slightly to 28.4 percent in 1985.

1/ Excluding imports of * * *, which was not able to report import data for 1981.

Table II-39.—Certain steel castings: U.S. imports and apparent U.S. consumption, by types, 1981-85

Item	1981	1982	1983	1984	1985
	U.S. imports (tons)				
Axle parts	1,930	854	921	1,767	1,649
Levers	***	***	***	***	***
Drive sprockets	1/ 819	738	896	1,060	882
Beam hanger brackets	***	1,036	1,151	2,060	1,659
Sockets and suspension brackets	0	***	***	0	***
Parts of valves	8,556	12,067	4,302	7,782	8,908
	Apparent U.S. consumption (tons)				
Axle parts	15,971	9,292	8,107	13,941	12,267
Levers	***	***	***	***	6,239
Drive sprockets	1/ ***	***	***	***	***
Beam hanger brackets	***	***	***	2,504	2,149
Sockets and suspension brackets	***	***	***	***	***
Parts of valves	54,965	45,749	20,663	27,236	31,330
	Ratios of imports to apparent consumption (percent)				
Axle parts	12.1	9.2	11.4	12.7	13.4
Levers	2/	***	***	***	***
Drive sprockets	1/ ***	***	***	***	***
Beam hanger brackets	***	***	***	82.3	77.2
Sockets and suspension brackets	-	1.9	1.7	-	25.3
Parts of valves	15.6	26.4	20.8	28.6	28.4

1/ Excluding imports of * * *, which was not able to report import data for 1981.
2/ * * *.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Prices

Cast-steel truck and machinery components include axle parts, levers, drive sprockets, beam hanger brackets, and sockets and suspension brackets, as described earlier in the report. Because of the durable nature of these cast-steel products, there is virtually no replacement market. The majority of the components are sold to OEM accounts for new production of off-highway construction vehicles and on-highway trucks for which these parts are intended.

There are only a few domestic producers and importers of axle parts and levers. These items are produced for order only, and each follows a detailed set of specifications presented by the purchaser. Each component is unique in size, weight, and configuration depending upon the needs of the purchaser. Although there are few sellers in the market, there are an even smaller number of purchasers. Therefore, a buyers' market exists for axle parts and levers. Some purchasers import directly, which increases price competition among sellers.

Questionnaire data indicate that for axle parts and levers, each domestic producer or importer receives a contract to supply a specific part by one of the few purchasers. These contracts generally cover the purchaser's requirements for the part for a one-year period, with specific quantities to be released for shipment at the purchaser's convenience in time to meet production schedules. Usually only one supplier will provide that particular part to the purchaser. Since the weight range for levers and axle parts can be 150 to 5,000 pounds per unit, firms try to specialize in a limited weight range.

The Commission requested net selling prices for axle parts for off-highway heavy construction vehicles. Three domestic producers and four importers responded with usable data. A range of prices of axle parts on a per pound basis is presented in table II-40. The wide difference in prices between the reporting firms is a result of these firms winning contracts for vastly different-sized axle parts. A definite price trend could not be determined because of wide variations in the sizes of the axle parts.

Two U.S. producers and three importers reported prices for levers for front-end loaders and crawler tractors. One U.S. producer reported that its selling price for a certain lever was $*** per pound throughout the five-year subject period. The price ranges for levers, detailed in table II-41, reflect differences in cast weights, similar to the problem discussed earlier concerning axle parts.

One U.S. producer responded with prices of drive sprockets for track-laying construction machinery and tractors. This firm reported that its price was $*** per pound from * * * before decreasing * * * to $*** per pound in * * * (table II-42).

One U.S. producer reported prices for beam hanger brackets for class 6, 7, and 8 on-highway trucks (table II-43). This firm showed a slight price increase for the beam hanger brackets from $*** per pound in 1981 to $*** per pound in 1982. The price then * * * declined to $*** per pound in 1983 followed by $*** per pound in 1984, and finally $*** per pound in 1985. * * * showed a decrease in prices for sockets and suspension brackets for 5-ton military trucks (table II-44). Its price decreased from $*** per pound

Table II-40.—Axle parts for off-highway heavy construction vehicles: Producers' and importers' prices per pound, by quarters, January 1981-December 1985

Period	Imported		U.S.-produced	
	Low price	High price	Low price	High price
1981:				
January-March	$***	$***	$***	$***
April-June	***	***	***	***
July-September	***	***	***	***
October-December	***	***	***	***
1982:				
January-March	***	***	***	***
April-June	***	***	***	***
July-September	***	***	***	***
October-December	***	***	***	***
1983:				
January-March	***	***	***	***
April-June	***	***	***	***
July-September	***	***	***	***
October-December	***	***	***	***
1984:				
January-March	***	***	***	***
April-June	***	***	***	***
July-September	***	***	***	***
October-December	***	***	***	***
1985:				
January-March	***	***	***	***
April-June	***	***	***	***
July-September	***	***	***	***
October-December	***	***	***	***

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

in 1981 to $*** per pound in 1982 and further to $*** per pound in 1983. The price of sockets and suspension brackets * * * $*** per pound * * *. Two importers reported price data for beam hanger brackets. One of the importers' prices actually increased irregularly from $*** per pound in January-March 1981 to * * * $*** per pound in January-March 1984. This price then decreased to $*** per pound by the end of 1985.

Valve manufacturers report that castings are sold in a variety of forms that may significantly affect price. The castings may be in a rough form, partially machined, or quality tested. Quality testing may add 100 percent to the price of the valve depending on which tests the valve manufacturer requires. Petrochemical industry valves usually require pressure testing to insure strength. The petrochemical industry uses a significant quantity of steel valves. Other quality-control tests include radiography and magnetic particle testing for structural strength and defects. These tests are very expensive and are usually reserved for valves that are dedicated for use in the nuclear industry.

Table II-41.—Levers for front-end loaders and crawler tractors: Producers' and importers' prices per pound, by quarters, January 1981–December 1985

Period	Imported		U.S.-produced	
	Low price	High price	Low price	High price
1981:				
January-March	1/	1/	$***	$***
April-June	1/	1/	***	***
July-September	1/	1/	***	***
October-December	1/	1/	***	***
1982:				
January-March	1/	1/	***	***
April-June	1/	1/	***	***
July-September	1/	1/	***	***
October-December	1/	1/	1/	1/
1983:				
January-March	1/	1/	1/	1/
April-June	1/	1/	***	***
July-September	1/	1/	***	***
October-December	1/	1/	***	***
1984:				
January-March	1/	1/	***	***
April-June	$***	$***	***	***
July-September	***	***	***	***
October-December	***	***	***	***
1985:				
January-March	***	***	***	***
April-June	***	***	***	***
July-September	***	***	***	***
October-December	***	***	***	***

1/ No prices reported.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

The Commission requested net selling prices of cast-valve bodies for commercial, 4-inch, 150-pound wedge gate valves. Wedge gate valves are the largest application category of valves. A few firms reported difficulty providing prices for specific valve bodies because valve manufacturers purchase a number of different valve bodies and parts all combined in one order. Three importers and two domestic producers did report prices for the specified steel valve parts (table II-45). Importer prices showed a general declining trend throughout the period. Lowest prices reported by producers were steady during 1982-84 before declining slightly in 1985. Highest prices reported by producers were relatively constant during 1982-83, increased in 1984, and fluctuated but remained above 1982-83 levels during 1985.

Table II-42.—Drive sprockets for crawler tractors: Producers' and importers' prices per pound, by quarters, January 1981–December 1985

Period	Imported		U.S.-produced
	Low price	High price	
1981:			
January-March	$***	$***	$***
April-June	***	***	***
July-September	***	***	***
October-December	***	***	***
1982:			
January-March	***	***	***
April-June	***	***	***
July-September	***	***	***
October-December	***	***	***
1983:			
January-March	***	***	***
April-June	***	***	***
July-September	***	***	***
October-December	***	***	***
1984:			
January-March	***	***	***
April-June	***	***	***
July-September	***	***	***
October-December	***	***	***
1985:			
January-March	***	***	***
April-June	***	***	***
July-September	***	***	***
October-December	***	***	***

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

In addition to the data discussed above, the Commission requested buyers of the subject products to provide prices of their largest purchase of U.S.-produced and imported steel castings of axle housings, levers, drive sprockets, beam hanger brackets, and sockets and suspension brackets. Although five purchasers responded with usable pricing data, the size and weight of the reported cast products varied widely from period to period. Thus, consistent long-term pricing trends were unavailable for a number of the products. However, * * * reported a 5-year pricing series for domestic axle housings. * * * purchased 725-pound axle housings from * * * in every period from 1981 through 1985. * * * purchase price rose from $*** per pound in 1981 to $*** per pound in 1982, or by * * * percent. The price then remained at $*** per pound through April-June 1985 before falling to $*** per pound, or by * * * for the remainder of 1985 (table II-46). Another purchaser, * * *, reported a 3-year pricing series for a * * * beam hanger bracket. * * * purchased this product domestically from * * * and imported the same product from * * *. The domestic price for this beam hanger bracket was $*** per

Table II-43.—Beam hanger brackets: Producers' and importers' prices per pound, by quarters, January 1981–December 1985

Period	Imported: Low price	Imported: High price	U.S.-produced
1981:			
January-March	$***	$***	$***
April-June	***	***	***
July-September	***	***	***
October-December	***	***	***
1982:			
January-March	***	***	***
April-June	***	***	***
July-September	1/	1/	***
October-December	1/	1/	***
1983:			
January-March	1/	1/	***
April-June	1/	1/	***
July-September	***	***	***
October-December	***	***	***
1984:			
January-March	***	***	***
April-June	***	***	***
July-September	***	***	***
October-December	***	***	***
1985:			
January-March	***	***	***
April-June	***	***	***
July-September	***	***	***
October-December	***	***	***

1/ No prices reported.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

pound in 1981 before rising to $*** per pound in January-March 1982, or by * * * percent. The domestic purchase price remained at this level throughout 1982 and 1983. The price of the imported product was $*** per pound through 1981 and 1982 before declining to $*** per pound in January-March 1983, or by * * * percent. In * * *, * * * ceased to purchase domestic and imported rough castings and began to exclusively purchase * * *. The price of the * * * was initially $*** per pound in 1984 and increased to $*** per pound in 1985. * * * reports that machining removes approximately 3 pounds of weight per unit. * * * was also able to supply long-term prices for domestic and imported sockets and suspension brackets. Domestic purchases were from * * * except for three occasions when * * * purchased from * * *.

Table II-44.—Sockets and suspension brackets: Producers' and importers' prices per pound, by quarters, January 1981-December 1985

Period	Imported	U.S.-produced
1981:		
January-March	1/	$***
April-June	1/	***
July-September	1/	***
October-December	1/	***
1982:		
January-March	1/	***
April-June	1/	***
July-September	1/	***
October-December	1/	***
1983:		
January-March	1/	***
April-June	1/	***
July-September	1/	***
October-December	1/	***
1984:		
January-March	1/	***
April-June	1/	***
July-September	1/	***
October-December	1/	***
1985:		
January-March	$***	***
April-June	***	***
July-September	***	***
October-December	***	***

1/ No prices reported.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Domestic prices for sockets and suspension brackets initially increased from $*** per pound in January-March 1981 to $*** in April-June 1981. Prices remained between $*** and $*** per pound through April-June 1983 except for October-December 1982 when * * * offered $*** per pound following * * * first procurement of this part from * * *. * * * price during this period matched the available import price. * * * then purchased from * * * during January-June 1983 at $*** per pound before switching back to * * * when offered the part at $*** per pound in July-September 1983. * * * purchase price remained at that level through April-June 1985 before rising slightly to $*** per pound for the remainder of 1985. * * * purchased Japanese sockets and suspension brackets in January-March 1981 at $*** per pound. Their price increased to $*** per pound in April-June 1981 and remained at that level through October-December 1982. In 1983-84 and January-March 1985 * * * purchased this part exclusively from U.S. vendors. In the final three periods of 1985 * * * began purchasing from * * *, a supplier of Argentine steel castings. * * * price for this imported product was $*** per pound.

Table II-45.—Cast-steel valve bodies for 4-inch, 150-pound wedge gate valves: Producers' and importers' net selling prices per pound, by quarters, January 1981-December 1985

Period	Importers		Domestic	
	Low price	High price	Low price	High price
1981:				
January-March	1/	1/	1/	1/
April-June	$***	$***	$***	$***
July-September	***	***	***	***
October-December	***	***	***	***
1982:				
January-March	***	***	1/	***
April-June	***	***	***	***
July-September	1/	1/	***	***
October-December	***	***	***	***
1983:				
January-March	***	***	***	***
April-June	***	***	***	***
July-September	***	***	***	***
October-December	***	***	***	***
1984:				
January-March	***	***	***	***
April-June	***	***	***	***
July-September	***	***	***	***
October-December	***	***	***	***
1985:				
January-March	***	***	***	***
April-June	***	***	***	***
July-September	***	***	***	***
October-December	***	***	***	***

1/ No prices reported.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Possible Causes of Injury Other Than Imports

Other possible causes of injury include (1) downturns in the market for the subject products or for the end products in which the subject products are used, (2) the manufacture of end products offshore by primary customers of the subject products, and (3) decreased exports of the end products in which the subject products are used. Several firms also mentioned severe price cutting by U.S. competitors as a possible cause of injury, but generally added that the price cutting was in order to meet prices of foreign competition.

With regard to the market for end products, information on production of 5-ton military trucks has been obtained from * * * of such trucks, which are the only vehicles in which sockets and suspension brackets are used. Production of 5-ton military trucks increased steadily from * * * trucks in 1981 to * * * in 1982, * * * in 1983, and * * * in 1984, before decreasing by * * * percent to * * * trucks in 1985.

Table II-46.—Axle housings, beam hanger brackets, and sockets and suspension brackets: Prices reported by purchasers, by quarters, 1981-85

Period	U.S.-produced axle housings	Beam hanger brackets		Sockets and suspension brackets	
		U.S.-produced	Imported	U.S.-produced	Imported
	Dollars per pound				
1981:					
January-March	$***	$***	$***	$***	$***
April-June	***	***	***	***	***
July-September	***	***	***	***	1/
October-December	***	***	***	***	***
1982:					
January-March	***	***	***	***	***
April-June	***	***	***	***	***
July-September	***	***	***	***	***
October-December	***	***	***	***	***
1983:					
January-March	***	***	***	***	1/
April-June	***	***	***	***	1/
July-September	***	***	***	***	1/
October-December	***	***	***	***	1/
1984:					
January-March	***	1/	2/ ***	***	1/
April-June	***	1/	2/ ***	***	1/
July-September	***	1/	2/ ***	***	1/
October-December	***	1/	2/ ***	***	1/
1985:					
January-March	***	1/	2/ ***	***	1/
April-June	***	1/	2/ ***	***	***
July-September	***	1/	2/ ***	***	***
October-December	***	1/	2/ ***	***	***

1/ Data not available.
2/ Machined castings.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Information has also been obtained from the Motor Vehicle Manufacturers Association on factory sales for 1981-85 of class 6, 7, and 8 on-highway trucks, in which beam hanger brackets are used. Sales of such trucks decreased from 244,088 trucks in 1981 to 156,838 trucks in 1982, or by 35.7 percent, increased to 166,315 trucks in 1983, or by 6.0 percent, and to 266,265 trucks in 1984, or by 59.9 percent, and decreased to 252,574 trucks in 1985, or by 5.1 percent.

In 1980 and 1982, Congress passed two laws that affected the market for beam hanger brackets. The Motor Carrier Act was approved in 1980 and allowed, among other provisions, for cargo back haul by independent truckers. This provision substantially reduced the number of class 7 and 8 trucks needed for interstate cargo transportation. The second decline in class 7 and 8 truck production occurred in 1982 when the Surface Transportation Assistance Act was passed. Three provisions contained in this legislation reduced the demand for class 7 and 8 highway vehicles. The first provision raised allowable cargo weight from 73,280 pounds to 80,000 pounds, the second increased allowable load width from 96 inches to 106 inches, and the final measure increased single trailor lengths to 48 feet. These three provisions reduced the number of class 7 and 8 trucks needed to transport domestic freight.

The production of cast-steel drive sprockets, axle housings, and levers are closely tied to sales of construction machinery. During the subject period, shipments of crawler-type construction machinery declined severely. Crawler-type construction machinery is the major user of cast-steel drive sprockets.

Shipments of crawler-type construction machinery declined from 21,958 units in 1981 to 10,268 units in 1982, or by 53 percent. Shipments then began to steadily rise to 15,479 units in 1984, or by 51 percent. Projected shipments for 1985 are down slightly to 15,103 units, which would represent an overall 31.2 percent decline from the beginning of the subject period, as shown in the following tabulation on shipments of crawler-type construction machinery:

	1981	1982	1983	1984	1985 1/
Crawler tractors----	15,789	7,053	7,247	8,917	7,481
Crawler loaders----	3,286	1,368	2,158	3,099	3,191
Excavators, crawler mounted----	2,333	1,382	2,057	3,076	3,937
Cranes, crawler mounted----	550	465	332	387	494
Total----	21,958	10,268	11,794	15,479	15,103

1/ Projected.

The same trend is apparent in shipments of machinery utilizing cast-steel levers. Shipments of such machinery declined from 33,369 units in 1981 to 22,673 units in 1982, representing a 32-percent decrease, and then gradually increased to a projected 31,763 units in 1985, or by 40 percent. The projected level of shipments of loader machinery is still 5 percent below the level of shipments in 1981, as shown in the following tabulation on shipments of loader-type construction machinery:

	1981	1982	1983	1984	1985 1/
Crawler loaders----	3,286	1,368	2,158	3,099	3,191
Loaders, 4-wheel drive non-skid steer----	13,168	7,592	8,894	10,490	10,805
Skid-steer loaders----	16,915	13,713	13,627	17,250	17,767
Total----	33,369	22,673	24,679	30,839	31,763

1/ Projected.

During 1982-83, the domestic market for construction machinery, including front-end loaders, crawler tractors, excavators, bulldozers, and other similar earth-moving machinery was depressed as a result of low levels of construction and surface-mining activity in the United States. There was also a strike at Caterpillar Tractor, the * * *. In addition, the demand for this type of equipment was also adversely affected by high interest rates; large quantities of idle machinery on hand following the recession; and reduced spending on highway construction, reclamation projects, and water and sewer facilities. During 1984 and 1985, demand for these machines began to recover, principally because of a rise in construction activity.

In order to remain competitive with foreign producers, several large U.S. construction machinery manufacturers have shifted production offshore. Caterpillar, Inc., the largest producer of construction machinery, has been subject to competition from foreign producers, especially by Komatsu of Japan, and has moved a significant portion of its manufacturing operations overseas including production of track loaders and smaller model tractors. Such shifts have led to an increase in imports of finished units of products containing cast-steel drive sprockets, axle housings, and levers.

There was also a large contraction in demand in the valve industry, and therefore, a similar contraction in the valve casting industry, in 1982 and 1983. The largest purchasing sector for valves is the petrochemical industry. Capital expenditures in new pipeline projects and replacement valves in existing pipelines are large demand items for valves. Since 1981, the domestic petroleum industry has been plagued by a variety of problems. Recessionary pressures in 1981-83 caused a downturn in capital investments. Oil industry capital outlays will be an estimated $33.8 billion in 1986, down 24 percent from that of 1985 and down 60 percent from the peak of $83 billion in 1981.

Imports of completed valves may have also adversely affected the domestic market for valve castings. The value of imports of hand-operated steel valves, including parts of valves, during 1981-85 is shown in the following tabulation (in thousands of dollars):

	Imports
1981	152,866
1982	143,832
1983	92,338
1984	106,620
1985	146,632

U.S. exports of construction machinery and valves were also adversely affected by the world recession, which decreased construction activity in all nations between 1981 and 1983. The diminishing demand for equipment overseas during this period can be attributed to several factors including a drop in construction activity in the OPEC nations. Reduced spending by the OPEC nations particularly affected valve exports, which suffered a marked decline in recent years. Such exports declined by approximately 29 percent in 1985 from the level of exports in 1984.

Another possible cause of injury includes substitutes of other materials for cast-steel levers and drive sprockets. Drive sprockets are frequently formed from forged segments that fit on the outside of a hub. According to * * *, forged drive sprockets are much more durable than cast-steel sprockets. Caterpillar currently forges the majority of its drive sprockets; other producers are importing forged drive sprockets. Imports of forged drive sprockets have followed the same trend as the demand for construction machinery, decreasing from $1.9 million in 1981 to $1.6 million in 1983 and then rising to $2.1 million in 1984.

Industry sources report that fabricated and ductile-iron levers are being substituted for steel castings in all but the larger models of front-end loaders, which are being produced by only a small number of manufacturers. * * *, a producer of front-end loaders, reported that * * * switched to fabricated levers 10 to 15 years ago when shortages of cast-steel levers developed. * * * claimed that fabricated levers are more practical and of better quality than cast-steel levers.

U.S. Producers' Efforts to Compete With Imports

Of the 35 U.S. producers of steel castings that responded to the Commission's questionnaire, 19 listed measures that they have taken to compete more effectively in the U.S. market for steel castings. A summary of the total expenditures made to compete more effectively is presented below (in thousands of dollars):

Type of expenditure	1981	1982	1983	1984	1985
Investments 1/	***	***	***	***	***
Cost reductions with existing equipment	***	***	***	***	***
Diversifications or expansions	2/	***	***	***	2/
Technological improvements	***	***	***	***	***
Organizational changes	2/	2/	2/	***	***
Marketing changes	2/	2/	***	***	***
All other expenditures	***	-	-	***	-
Total	7,148	7,233	2,737	4,120	2,501

1/ Investments in new equipment, in new facilities, and in other measures to improve competitiveness. Some of the items listed by firms under "investments" may more properly have been listed under other categories of expenditures.
2/ No dollar amounts of expenditures reported.

The five producers with the largest expenditures during 1981-85 to compete more effectively were * * *. The five producers' expenditures accounted for approximately 63 percent of the total reported expenditures.

*   *   *   *   *   *   *

* * * reported expenditures of $*** throughout 1981-85. Most of the expenditures were for investments in new equipment and technology to reduce costs and improve quality. * * *.

* * * steel castings, reported expenditures of $*** during 1981-85. * * *. * * *. * * *. * * *.

*   *   *   *   *   *   *

In addition to the five producers discussed above, * * * reported expenditures of $*** in 1980 (prior to the period under investigation) for a major modernization of its * * *. * * *. * * *.

* * *, a producer of parts of valves, completed a feasibility study to renovate most of its foundry during 1981-85, but "* * *."

U.S. Producers' Planned Adjustments If Relief Is Granted

In response to a question in the Commission's questionnaire on what adjustments responding firms would make if temporary relief under section 201 is granted (assuming relief of a 40-percentage point increase in tariffs for 5 years), 11 responding producers reported on plans to undertake specific adjustments and 5 producers indicated that they had no plan to undertake specific adjustments. Aggregate planned expenditures of the 11 producers that plan to undertake specific adjustments are presented in the following tabulation:

Type of expenditure	Anticipated expenditures (1,000 dollars)
Investments 1/	36,744
Cost reductions with existing equipment	5,722
Diversifications or expansions	5,900
Technological improvements	1,587
Organizational changes	4,300
Marketing changes	690
All other expenditures	500
Total	55,443

1/ Investments in new equipment, in new facilities, and in other measures to improve competitiveness. Some of the items listed by firms under "investments" may more properly have been listed under other categories of expenditures.

The five producers with the largest projected expenditures in their adjustment plans were * * *. The five producers' anticipated expenditures accounted for approximately 63 percent of the total anticipated expenditures.

III. BRONZE SHIP PROPELLERS

The Product

Description and uses

The term "bronze ship propellers" in the context of this investigation includes monobloc propellers of any size and bronze blades for controllable pitch propulsion systems. Each monobloc propeller is manufactured in a single casting. Controllable pitch propulsion systems (CPP's) are hydraulically controlled devices containing a propeller with adjustable blade positions. CPP blades are cast individually and separately from the hub, sold to specialized companies, finished to specifications, and incorporated in controllable pitch propulsion systems. Controllable pitch propulsion systems are not subject to this investigation since they constitute another product that includes a number of other major components besides the propeller unit.

Propellers for ships or boats range in diameter from 10 inches to 35 feet and in weight from a few pounds to over 200 tons. They normally have a minimum of 2 and a maximum of 7 blades, depending on the application. They are classified in three basic categories according to size and end use: (a) propellers for yachts and pleasure boats, under 36 inches in diameter; (b) propellers for commercial workboats and small military vessels, between 3 and 10 feet in diameter; and (c) ship propellers for oceangoing vessels, between 10 and 35 feet in diameter. Each of these types of propellers is subject to this investigation, though "ship" propellers are technically limited to type (c) described above.

The materials used in manufacturing propellers are nickel-aluminum bronze, manganese bronze, and chrome stainless steel. Nickel-aluminum bronze is by far the most prevalent material in the propeller industry. According to * * *, 90 percent of the marine propellers are made of this alloy. Although more expensive than manganese bronze, nickel-aluminum offers a low weight/strength ratio, high compatibility with a saltwater environment, and malleability in the cold state. Nickel-aluminum bronze propellers are therefore durable, resistant to saltwater corrosion, and repairable without preheating the metal. According to * * *, manganese bronze is used only upon special request by the buyer. Both nickel-aluminum bronze and manganese bronze propellers are subjects of this investigation.

Stainless steel propellers are primarily used on inland waterway vessels since the steel is subject to corrosion by salt and contaminated water. Stainless steel propellers are more difficult to cast than bronze propellers. During the casting process, stainless steel is subject to crevice cracks that gradually increase in size over the life of the propeller. Stainless steel propellers are also more difficult and expensive to grind and repair than bronze propellers because of the hardness of stainless steel compared with bronze. Despite their higher cost, stainless steel propellers are preferred by inland waterway users because they are perceived as more durable in inland waterway conditions. Stainless steel propellers are also used commercially in offshore operations that involve heavy loads, in spite of their susceptibility to corrosion in salt water.

The average propeller life is approximately 10 to 25 years and includes a number of repair cycles. The first repair cycle normally takes place within 5 years of the vessel's launch.

Manufacturing processes

The prevalent manufacturing method in the U.S. propeller industry includes the following operations: (a) molding, (b) casting, (c) hub/palm machining, (d) blade finishing, and (e) inspection and certification.

Molding and casting.—The first step is the fabrication of a full scale wooden pattern based on a detailed drawing of the propeller. The dimensions of the pattern are measured, using a shrink rule that takes into account the shrinking that occurs when the molten metal cools and solidifies. The pattern is made of a single propeller blade since all blades of a propeller are identical. The pattern is set on a vertical pin through the center of the hub and is placed inside a two-part box called a flask. A special sand mixture or cement is placed around the pattern, first in the bottom half, or drag. The sand mixture is hardened by the injection of CO_2 gas or by the mixing in of a liquid catalyst. Once the drag is completed, the upper half, or cope, is filled and hardened. The two halves are separated and the pattern removed. What remains is a cavity that represents a propeller blade. The pattern is then rotated to the next blade position and the process repeated. This is done until the required number of blades is molded.

After the mold is complete and hardened, molten metal is poured into an adjacent pouring basin through which it is channeled underneath the mold. It then rises from the bottom to fill the mold. Once filled, the mold slowly air cools, and the metal solidifies. The cooling time varies according to the size of the propeller from approximately 4 hours for small propellers of 30 inches in diameter to 1 week and longer for propellers of over 10 feet in diameter. The casting is then broken out of its sand mold. The pouring basin, channel, and other attachments are cut off, and the surfaces of the raw casting are rough ground.

Machining, grinding, and finishing.—These operations tend to add over 100 percent to the value of the rough casting. They are performed in the following order. A tapered hole is drilled and bored in the center of the hub to match the shaft on which the propeller will be mounted. The ends of the hub are machined flat, and holes are drilled for any accessories. The propeller is then checked for diameter, pitch, track, and other critical dimensions. The measurements are compared with the design dimensions, and material removal is established consistent with the specified manufacturing tolerances. 1/ Production personnel then grind the blade and hub surfaces and subsequently polish them to a smooth finish, using progressively finer grinding discs or belts. More and more owners are including specific polishing requirements in their specifications since surface roughness of propellers is directly related to fuel consumption. Grinding and polishing is still mostly done with hand-held machinery. 2/ Finally, the propeller is

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1/ A few companies utilize computerized equipment to measure the geometry of the propeller and prepare the blades for material removal. This allows considerable gains in accuracy and shortens manufacturing time.

2/ A few producers in the United States are currently utilizing semi-automatic robotic machinery for this purpose.

balanced, either statically or dynamically, depending upon the application. After completion, the propeller is examined and approved by the inspector prior to shipment.

U.S. tariff treatment

Imports of bronze monobloc ship propellers, bronze controllable pitch propulsion systems, and bronze propellers for yachts and pleasure boats enter under TSUS items 657.35, 678.50, and 696.15, respectively. Monobloc ship propellers are classified in TSUS item 657.35, which provides for articles of alloys of copper (except nickel silver and copper-nickel), not coated or plated with precious metal. Item 657.35 is divided for statistical reporting purposes into three numbers (annotations), of which only 657.3530 covers ship propellers and blades therefor. The column 1 (most-favored-nation) rate of duty 1/ is 5.3 percent ad valorem. The column 2 rate of duty 2/ is 46 percent ad valorem. The rate of duty for imports under this item from least developed developing countries (LDDC's) is the final MTN staged rate of 5 percent ad valorem. Imports of articles entered under this item are eligible for duty-free treatment under the Generalized System of Preferences (GSP), the Caribbean Basin Economic Recovery Act (CBERA), and the U.S.-Israel Free Trade Area Implementation Act of 1985.

Controllable pitch propulsion systems are classified in TSUS item 678.50, which covers machines not specially provided for, and parts thereof. Item 678.50 is divided for statistical reporting purposes into several annotations, of which only item 678.5095, a basket category covering other types of machines, includes propellers. The column 1 (most-favored-nation) rate of duty is 3.9 percent ad valorem. The column 2 rate of duty is 35 percent ad valorem. The rate of duty for imports under this item from LDDC's is the final MTN staged rate of 3.7 percent ad valorem. Imports of articles entered under this item are eligible for duty-free treatment under the GSP, the CBERA, and the U.S.-Israel Free Trade Area Implementation Act of 1985.

Propellers for yachts and pleasure boats are classified in TSUS item 696.15, which provides for parts for yachts and pleasure boats. Item 696.15 is divided for statistical reporting purposes into three annotations, of which only item 696.1525 covers propellers. The column 1 (most-favored-nation) rate of duty is 4.4 percent ad valorem. The column 2 rate of duty is 30 percent ad valorem. The rate of duty for imports under this item from LDDC's is the final MTN staged rate of 4.2 percent ad valorem. Imports of articles entered under this item are eligible for duty-free treatment under the GSP and the CBERA and are currently dutiable at the rate of 3.1 percent ad valorem under the U.S.-Israel Free Trade Area Implementation Act of 1985.

1/ The col. 1 rate is applicable to imported products from all countries except those Communist countries and areas enumerated in general headnote 3(d) of the TSUS. However, these rates would not apply if preferential treatment is sought and granted to products of developing countries under the Generalized System of Preferences (GSP) or the Caribbean Basin Economic Recovery Act (CBERA), or to products of Israel or of least developed developing countries (LDDC's), as provided under the special rates of duty column. The People's Republic of China, Hungary, Romania, and Yugoslavia are the only Communist countries currently eligible for MFN treatment.

2/ The col. 2 rate of duty applies to imported products from those Communist countries and areas enumerated in general headnote 3(d) of the TSUS.

Repair parts (including marine propellers) imported for use on vessels of foreign registry and engaged in international trade are exempt from customs duties (19 U.S.C. 1309(a)(2)). Further, a refund of 99 percent of duties paid (drawback) may be claimed on dutiable parts of vessels (including propellers) imported for use in the construction of vessels built for foreign account and ownership or for the government of any foreign country (19 U.S.C. 1313(g)). Also, imports of propellers used for the repair or construction of U.S. military ships (Department of Defense procurement) are exempt from duty (TSUS item 832.00) when certified to the Commissioner of Customs by the authorized procuring agencies to be emergency war material purchased abroad. The Commission staff found no evidence of U.S. Government use of TSUS item 832.00 during the period under investigation. * * * indicated to Commission staff that domestic manufacturing facilities have provided for all U.S. Government propeller requirements in recent years.

U.S. Producers

The petition in this investigation identified nine producers 1/ of bronze ship propellers; eight of the nine were identified as represented producers. Each of the nine firms provided data in response to the Commission's questionnaire, although in several instances the data received were incomplete. In addition, during the course of the investigation, the Commission identified some additional producers, only one 2/ of which is a producer of a significant amount of bronze ship propellers. The remaining producers identified by the Commission are bronze metal foundries that cast some bronze ship propellers for the major producers or for other firms that grind, finish, and polish propellers or manufacture controllable pitch propeller systems; the tonnage produced by such foundries is negligible compared with the tonnage of the firms identified in the petition. The nine producers identified in the petition, the two additional producers identified by the Commission that provided usable data, and each producer's percentage share of the tonnage of U.S. production of bronze ship propellers in 1984 and 1985, are presented in the following tabulation:

1/ Producers of bronze ship propellers consist of those firms that have foundries that cast bronze ship propellers. All of the major foundries that cast bronze ship propellers do some or all of their own machining. Individuals in the propeller business regard "producers" of bronze ship propellers to be those companies that machine and/or grind the propellers, since much or most of the value of a finished bronze ship propeller is attributable to the finishing/grinding process, not the casting process. However, most of the principal firms that machine and/or grind the propellers also have their own casting operations.

2/ Philadelphia Naval Shipyard, Philadelphia, PA.

Producer	Share of production 1984	1985
Avondale Industries, Inc	1/ ***	1/ ***
Columbian Bronze Corp	***	***
Coolidge Propeller Corp	***	***
Crown Nonferrous Foundry	***	***
Doran-Alabama Propeller Co, Inc	***	***
Ellis Propeller Co., Inc	***	***
Ferguson Propeller, Inc	***	***
Kahlenberg Bros. Co	2/	2/
Lips Propellers, Inc	3/ ***	3/ ***
Michigan Wheel Corp	***	***
Philadelphia Naval Shipyard	***	***
	100.0	100.0

1/ Avondale * * *.
2/ Kahlenberg Bros., a petitioner, provided data on its total production of propellers, i.e., stainless steel, steel, cast iron, and bronze ship propellers. Bronze ship propellers account for * * * percent of Kahlenberg's propeller sales, and are believed to be * * * of bronze ship propellers.
3/ Lips Propellers, Inc., an unrepresented producer listed in the petition, is * * *. However, Lips has * * * of bronze ship propellers at its Chesapeake, VA facility, where propellers are finished, ground, and polished. Lips is in opposition to the petition.

The principal producers of bronze ship propellers during the 1981-85 period were Avondale Industries, Inc., Columbian Bronze Corp., Coolidge Propeller Corp., Ferguson Propeller, Inc., Michigan Wheel Corp., and Philadelphia Naval Shipyard. The six producers accounted for * * * percent of U.S. production of bronze ship propellers in both 1984 and 1985. The bronze ship propeller operations of each of the six producers are discussed below.

Avondale Industries, Inc., New Orleans, LA, casts its bronze ship propellers at its Service Foundry Division, Waggaman, LA, and advances and finishes the castings at its Harvey Quick Repair Division in Harvey, LA. Avondale produces bronze ship propellers * * * for use by its shipyard in New Orleans. * * *. Avondale is a petitioner in the subject investigation.

Columbian Bronze Corp., Freeport, NY, wholly-owned by Ferguson Propeller, Inc., casts, machines, and polishes its bronze ship propellers at its facility in Freeport. Columbian is a petitioner in the subject investigation.

Coolidge Propeller Corp., Pascagoula, MS, operates casting and finishing facilities in Pascagoula, MS, and Seattle, WA. Coolidge is owned by Maritime Holdings, Inc., Grand Rapids, MI. Prior to January 1, 1986, the Pascagoula and Seattle facilities were operating divisions of Michigan Wheel Corp., Grand Rapids, MI. Coolidge stated in its questionnaire response that * * * "* * *." According to * * *, Coolidge has * * *. * * *. Coolidge is listed as a petitioner in the petition, * * *. However, Coolidge * * *.

Ferguson Propeller, Inc., Hoboken, NJ, * * *, casts and finishes bronze ship propellers at its facility in Hoboken. Ferguson is a petitioner in the subject investigation.

Michigan Wheel Corp., Grand Rapids, MI, * * *, casts and finishes bronze ship propellers at its facility in Grand Rapids. Michigan Wheel's parent is Maritime Holdings, Inc., Grand Rapids, MI. Michigan Wheel consented to be a petitioner in the subject investigation mainly because * * *. However, as of January 1, 1986, Maritime Holdings transferred responsibility for the operation of the Pascagoula facility to Coolidge Propeller Corp. Michigan Wheel has indicated that it * * *.

Philadelphia Naval Shipyard, a U.S. Navy operation, casts and finishes bronze propellers * * * at its facility in Philadelphia, PA. Philadelphia Naval Shipyard also casts a limited amount of other bronze castings. Philadelphia Naval Shipyard * * * the petition in the subject investigation.

The producers that are currently in support of this investigation accounted for * * * percent of U.S. production of bronze ship propellers in 1984 and * * * percent in 1985. Two producers, accounting for * * * percent of production in 1984 and * * * percent in 1985, indicated that they do not wish to take a position in support of or in opposition to the petition.

U.S. Importers

There were 17 known U.S. importers of bronze ship propellers during the 1981-85 period. The following tabulation presents the 17 importers and each importer's share of the tonnage of U.S. imports of bronze ship propellers in 1984 and 1985 (in percent):

Importer	Share of imports 1984	Share of imports 1985
* * *	1/	***
* * *	***	***
* * *	***	***
* * *	2/	***
* * *	2/	***
* * *	***	1/
* * *	***	***
* * *	2/	***
* * *	***	***
* * *	***	***
* * *	***	***
* * *	2/	***
* * *	***	***
* * *	***	***
* * *	2/	***
* * *	***	***
* * *	1/	1/
	100.0	100.0

1/ Less than 0.05 percent.
2/ * * *. Usable import data for each of the five importers were not available for 1984. However, aggregate imports of the five importers amounted to * * * percent of the tonnage of total U.S. imports in 1984 and * * * percent in 1985.

Note: Because of rounding, figures may not add to totals shown.

In addition to the importers during the 1981-85 period, * * *. (The imports attributed to * * * in 1985 in the above tabulation were imported in bond for * * *.) Also, as previously reported, * * *.

The principal importers of bronze ship propellers during the 1981-85 period were * * *. The six importers accounted for approximately 75 percent of the tonnage of U.S. imports of bronze ship propellers in 1984 and 88.2 percent in 1985. Each of the six importers is discussed below.

* * * imported * * * tons of bronze * * * from * * * during the 1981-85 period. * * *. * * *. In its response to a question in the Commission's questionnaire on factors in the firm's decision to import bronze ship propellers in lieu of purchasing bronze ship propellers produced in the United States, * * * listed delivery time, price, and quality of product as "very important" factors and traditional source as a "somewhat important" factor.

* * * imported * * * tons of finished bronze ship propellers, valued at $***, from * * * in 1985; usable, disaggregated data for * * * are not available for 1981-84. * * * resells the propellers primarily to * * *. In its response to the question in the Commission's questionnaire on factors in the firm's decision to import bronze ship propellers in lieu of purchasing bronze ship propellers produced in the United States, * * * listed price, quality of product, delivery time, and "different product mix" as "very important" factors and credit terms and traditional source as "somewhat important" factors.

Lips Propellers, Inc., Chesapeake, VA, is a wholly-owned affiliate of Lips United B.V., Drunen, The Netherlands. Lips also has facilities in Portland, OR, Seattle, WA, and Oakland, CA. Lips imports * * * from its parent company in the Netherlands for finishing at Lips' manufacturing facility in Chesapeake, VA, and subsequent sale to * * *. Lips began to import * * *. Lips has a capacity to cast * * * tons per year of bronze ship propellers at its Chesapeake facility, but has * * * "* * *." Lips does * * *. In its response to the question in the Commission's questionnaire on factors in the firm's decision to import bronze ship propellers in lieu of purchasing bronze ship propellers produced in the United States, Lips listed * * *. Lips also stated that "* * *."

*   *   *   *   *   *   *

* * * imported * * * tons, valued at $***, of finished bronze ship propellers from * * * in 1985; usable, disaggregated data for * * * are not available for 1981-84. * * * resells the propellers to various customers. * * * did not indicate the factors in its decision to import bronze ship propellers in lieu of purchasing bronze ship propellers produced in the United States.

*   *   *   *   *   *   *

The U.S. Market

Apparent U.S. consumption

The apparent U.S. consumption of bronze ship propellers is presented in the following tabulation (in tons):

Year	Apparent U.S. consumption
1981	1/ 3,117
1982	2,938
1983	2,334
1984	2,826
1985	3,070

1/ Understated because it excludes shipments of * * *, which was not able to provide shipment data for 1981.

Apparent U.S. consumption of bronze ship propellers decreased by * * * percent in 1982, 1/ decreased by 20.6 percent in 1983, increased by 21.1 percent in 1984, and increased by 8.6 percent in 1985.

Channels of distribution

Bronze ship propellers are manufactured and sold in three basic size categories: (a) propellers over 10 feet in diameter, and used on oceangoing commercial and military vessels; (b) propellers from 3 to 10 feet in diameter, used on commercial workboats and smaller military ships; and (c) propellers under 3 feet in diameter, used on recreational boats and yachts. Propeller manufacturers tend to specialize in one of these three size categories in order to maximize the efficiency of their production facilities.

In the market for propellers over 3 feet in diameter, the sale takes place through a bidding process initiated either by shipyards or by ship owner/operators. A request for bids, which includes detailed technical specifications, is received by the propeller manufacturer, who bids on the job as a prime contractor. As such, the manufacturer has the option to produce the propeller or to purchase it from another source. In the case of Government procurement contracts, however, any subcontract must obtain the preliminary approval of the procuring agency. A number of imports have entered the market through subcontracts. .

Industry sources indicate that price is the main factor determining the award of a contract. In the market for propellers over 3 feet in diameter, there are no published price lists. Prices are primarily set by the pound and the amount of machining required, which is determined by the complexity of the design and by the tolerances required. Transportation costs are generally not included in the quoted price and are paid by the buyer. Delivery time varies

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1/ Excluding 1982 data for * * *, which was not able to provide shipment data for 1981.

from a couple of weeks to 6 months, depending on the size of the propeller and the backlog of the supplier. The manufacturers typically provide a 1-year warranty.

The U.S. Government originates approximately 95 percent of the present economic activity in the market for propellers over 3 feet in diameter. Principal contracting Government agencies include the Naval Sea Systems Command, the Military Sealift Command, and the U.S. Coast Guard. * * * of * * *, one of the few domestic firms participating in the 10 feet and larger market, informed Commission staff that * * * percent of his trade in recent years involved Government contracts with the U.S. Navy and Coast Guard.

In the commercial segment of the market, sales also take place by bidding. Producers and importers receive the technical specifications from the shipyard, from a marine architect, or from the ship owner/operator. Manufacturers and importers submit a written quote. While price is still the major factor in the purchasing decision, other elements may play a role, such as prior business relations, the reputation of the manufacturer, and timely deliveries since an idle ship represents an economic loss. The original producer may have a slight advantage when supplying a replacement propeller, but generally, a vessel owner requests quotes from a number of sources even in this case. In the case of repair work on oceangoing ships, industry sources have expressed concern that a considerable amount of activity is being carried out at foreign repair facilities because of time and cost considerations. In recent years the only commercial shipbuilding activity utilizing large propellers has been in the area of container ships.

Propellers under 3 feet in diameter are used on recreational and small commercial boats, such as crew boats and fishing boats. This type of propeller is manufactured in standard sizes. Price lists are available. The manufacturer maintains inventories and sells to shipyards, propeller shops, distributors, and original equipment manufacturer (OEM) accounts.

Shipyards purchase small propellers much as they do large propellers; bids are requested from producers and importers for the quantity desired. Each yard purchases only as many propellers as needed for planned construction. Demand in the small propeller market is growing as demand for pleasure crafts has increased in recent years.

Manufacturers sell to propeller shops in a variety of quantities and sizes. These shops keep a stock of standard propeller sizes to supply the market. Propeller shops specialize in replacement propellers. Since small propellers are used in much shallower waters than large propellers, the instances of damage are much greater. Damage generally requires replacement since repair costs are high relative to the value of the propeller. Timely supply of replacement propellers is a major consideration in the small propeller market. * * * indicated to Commission staff that he started importing * * * propellers because * * * were unable to obtain replacement propellers from domestic suppliers in less than 6 to 8 weeks. Keeping a vessel idle for such a long period of time represents a considerable hardship for a * * *.

The distributors of boat propellers are generally marine parts dealers. These supply houses purchase large quantities of propellers and sell to smaller propeller shops and other small end users.

The final market segment for small propellers is the OEM accounts. These are producers of motors for pleasure crafts, such as Evinrude and Mercury. Demand in this market seems fairly healthy because of the upward trend in the sales of pleasure crafts.

The Question of Increased Imports

U.S. imports

Reported U.S. imports of bronze ship propellers are shown in table III-1. The tonnage of imports of bronze ship propellers decreased by 1.9 percent in 1982 and by 31.0 percent in 1983 and increased by 1.9 percent in 1984 and by 232.1 percent in 1985. The value of imports of bronze ship propellers increased by 15.8 percent in 1982, decreased by 7.3 percent in 1983, decreased by 23.8 percent in 1984, and increased by 81.1 percent in 1985. The principal sources of U.S. imports of bronze ship propellers in 1985 were Japan and the Netherlands. The quantity and value of imports by country in 1985 are presented in appendix table D-12.

Ratio of imports to production

The ratios of U.S. imports to U.S. production of bronze ship propellers on a tonnage basis were * * * percent 1/ in 1981, 5.7 percent in 1982, 4.5 percent in 1983, 3.8 percent in 1984, and 13.4 percent in 1985.

The Question of Serious Injury

In order to gather data on the question of serious injury to U.S. producers of castings of bronze ship propellers, questionnaires were sent to the 8 represented producers listed in the petition, the unrepresented producer listed in the petition, and to 13 other companies believed to possibly produce castings of bronze ship propellers. The domestic industry data appearing in this section of the report consist of data for seven of the eight represented producers 2/ listed in the petition and for two other producers, and are believed to account for over 95 percent of actual U.S. production of castings of bronze ship propellers.

1/ Overstated because * * * was not able to report data for 1981.

2/ The only represented producer for which data are excluded is Kahlenberg Bros. Co., which provided data on its total propeller sales but not separately on its bronze ship propellers. Bronze ship propellers account for * * * percent of Kahlenberg's propeller sales, and are believed to be * * * of bronze ship propellers.

Table III-1.—Bronze ship propellers: U.S. imports, 1981-85

Item	1981	1982	1983	1984	1985
Quantity——————tons—:	158	155	107	109	362
Value———1,000 dollars—:	1,219	1,411	1,308	997	1,806
Unit value————per ton—:	$7,715	$9,103	$12,224	$9,147	$4,989

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

U.S. production, capacity, and capacity utilization

Production data presented in this section consist of data obtained from U.S. producers on production of castings of bronze ship propellers and other bronze castings produced in the establishments where the bronze ship propellers are cast. Producers were also asked to report the average annual practical capacity 1/ of their U.S. establishments to produce bronze ship propellers.

Data on U.S. production, capacity, and capacity utilization of castings of bronze ship propellers are shown in table III-2. U.S. production of castings of bronze ship propellers decreased by * * * percent 2/ in 1982 and by 12.1 percent in 1983, increased by 19.4 percent in 1984, and decreased by 5.2 percent in 1985. Total U.S. production of bronze castings by firms producing bronze ship propellers followed a similar trend. Production of bronze ship propellers accounted for 86 to 91 percent of these firms' total production of bronze castings during 1981-85.

Reported capacity to produce castings of bronze ship propellers remained relatively constant during the 1981-85 period, fluctuating between a low of * * * tons in 1981 3/ and a high of 6,000 tons in 1984. 4/ Total capacity to produce bronze castings by firms that produce bronze ship propellers also remained relatively constant, fluctuating between * * * and * * * tons.

1/ Practical capacity was defined as the greatest level of output a plant can achieve within the framework of a realistic work pattern. Producers were asked to consider, among other factors, a normal product mix and an expansion of operations that could be reasonably attained in their industry and locality in setting capacity in terms of the number of shifts and hours of plant operation.

2/ Excluding 1982 data for * * *, which was not able to report data for 1981.

3/ Excludes data for * * *, which was not able to provide data for 1981.

4/ * * *, a producer of * * * bronze ship propellers per year, reported a capacity of between * * * and * * * tons per year to produce bronze ship propellers. * * * data do not appear in the above table because of the * * *, and because the great bulk of * * * production and capacity utilization has been * * *.

Table III-2.--Bronze castings: U.S. production, average capacity, and capacity utilization, by types, 1981-85

Item	1981 1/	1982	1983	1984	1985
	Production (tons)				
By producers of bronze ship propellers:					
Bronze ship propellers	3,175	2,726	2,395	2,859	2,709
Other bronze castings	***	***	***	***	***
Total	***	***	***	***	***
	Capacity (tons)				
Of producers of bronze ship propellers:					
Bronze ship propellers	5,832	5,837	5,862	6,000	5,985
Other bronze castings	***	***	***	***	***
Total	***	***	***	***	***
	Capacity utilization (percent)				
Of producers of bronze ship propellers:					
Bronze ship propellers	54.4	47.5	40.9	47.6	45.3
Other bronze castings	***	***	***	***	***
Average	***	***	***	***	***

1/ Excludes data for ***, which was not able to provide data for 1981.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Capacity utilization of castings of bronze ship propellers decreased from 54.4 percent in 1981 to 47.5 percent in 1982 and 40.9 percent in 1983, increased to 47.6 percent in 1984, and decreased to 45.3 percent in 1985. Capacity utilization of other bronze castings was in the * * * percent range, but the data are skewed by * * *. Excluding data for * * *, capacity utilization of other bronze castings ranged from a low of * * * percent in 1981 to a high of * * * percent in 1985.

U.S. producers' domestic shipments

U.S. producers' domestic shipments of bronze ship propellers are presented in table III-3. The quantity of U.S. producers' domestic shipments

Table III-3.—Bronze ship propellers: U.S. producers' domestic shipments, by types, 1981-85

Item	1981 1/	1982	1983	1984	1985
	Quantity (tons)				
Intra- and inter-company transfers	***	***	***	***	***
Domestic shipments	***	***	***	***	***
Total	2,959	2,783	2,227	2,717	2,708
	Value (1,000 dollars)				
Intra- and inter-company transfers	***	***	***	***	***
Domestic shipments	***	***	***	***	***
Total	25,764	27,408	21,361	28,683	27,406

1/ Excludes data for * * *, which was not able to provide data for 1981.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

(including intra- and intercompany transfers) of bronze ship propellers decreased by * * * percent in 1982 1/ and by 20.0 percent in 1983, then increased by 22.0 percent in 1984, and decreased again by 0.3 percent in 1985. The value of U.S. producers' total domestic shipments of bronze ship propellers decreased by * * * percent in 1982 2/ and by 22.1 percent in 1983, then increased by 34.3 percent in 1984 and decreased by 4.5 percent in 1985.

U.S. producers' exports

Only * * * exported bronze ship propellers during 1981-85. The * * * aggregate exports are presented in the following tabulation:

* * * * * * *

U.S. producers' exports of bronze ship propellers were small compared with U.S. producers domestic shipments. Exports of bronze ship propellers by U.S. producers, as a ratio of U.S. producers' domestic shipments (including intra- and intercompany transfers), were * * * percent in 1981, * * * percent

1/ Excluding 1982 data for * * *, which was not able to provide data for 1981.
2/ Ibid.

in 1982, * * * percent in 1983, * * * percent in 1984, and * * * percent in 1985. The quantity of U.S. exports decreased by * * * percent in 1982, * * * percent in 1983, * * * percent in 1984, and * * * percent in 1985.

U.S. producers' inventories

Producers were requested to provide the Commission with their inventories of their own production of bronze ship propellers as of December 31 of each of the years 1981-85. Inventories of the four reporting producers are presented in the following tabulation (in tons):

Year	Inventories as of Dec. 31
1981	477
1982	360
1983	322
1984	***
1985	***

Most of the reported inventories consisted of "work-in-progress," i.e., propellers that were being worked on as of December 31 of each of the years. Such propellers are already contracted for, indeed are actually owned, by customers and are not in inventory for possible later sale in the commercial market. Only a very small share of the reported inventories are unsold finished goods. There were virtually no reported inventories of any other types of bronze castings.

As a share of total shipments of the four producers that reported inventories, inventories were 30.5 percent as of December 31, 1981, 20.3 percent as of December 31, 1982, 29.6 percent as of December 31, 1983, * * * percent as of December 31, 1984, and * * * percent as of December 31, 1985.

U.S. employment and productivity

Eight producers reported data on employment, hours worked, 1/ wages paid, and total compensation paid, 2/ in contrast with the sections of this report on U.S. production and U.S. producers' shipments, where nine producers reported. The data collected on employment, hours worked, wages paid, total compensation paid, average hourly wages, and productivity are presented in table III-4.

The average number of production and related workers producing castings of bronze ship propellers decreased each year, by * * * percent 3/ in 1982,

---

1/ * * * reported no data on hours worked.
2/ * * * did not report any employment-related data.
3/ Excluding 1982 data for * * *, which was not able to report data for 1981.

Table III-4.—Average number of production and related workers employed in establishments producing bronze ship propellers; hours worked by such workers; wages, total compensation, and average hourly wages paid to such workers; and productivity by such workers, 1981-85

Product	1981 1/	1982	1983	1984	1985
Production and related workers producing—					
Bronze ship propellers	602	687	641	614	583
All bronze castings	***	***	***	***	***
Hours worked by production and related workers producing 2/—					
Bronze ship propellers 1,000 hours	1,101	1,230	1,136	1,111	1,075
All bronze castings 1,000 hours	***	***	***	***	***
Wages paid to production and related workers producing—					
Bronze ship propellers 1,000 dollars	11,486	12,928	12,096	12,973	13,373
All bronze castings 1,000 dollars	***	***	***	***	***
Total compensation paid to production and related workers producing 3/—					
Bronze ship propellers 1,000 dollars	14,421	16,560	15,431	16,438	16,887
All bronze castings 1,000 dollars	***	***	***	***	***
Average hourly wages of production and related workers producing 4/—					
Bronze ship propellers	$***	$***	$***	$***	$***
All bronze castings	***	***	***	***	***
Output per 1,000 hours worked of production and related workers producing bronze ship propellers 5/—tons	***	***	***	***	***

1/ Excludes data for * * *, which was not able to provide employment-related data for 1981.
2/ Excludes data on hours worked by production and related workers at * * *, which was unable to provide these data.
3/ * * * did not report data on total compensation.
4/ Excludes data on wages of production and related workers at * * * , which was unable to provide data on hours worked.
5/ Based only on firms that provided both production data and data on hours worked.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

6.7 percent in 1983, 4.2 percent in 1984, and 5.0 percent in 1985. Hours worked 1/ on bronze ship propellers also decreased each year, by * * * percent 2/ in 1982, 7.6 percent in 1983, 2.2 percent in 1984, and 3.2 percent in 1985.

Average hourly wages 3/ of production and related workers producing bronze ship propellers increased from $*** in 1981 to $*** in 1982, $*** in 1983, $*** in 1984, and $*** in 1985. The trend in average hourly wages for all bronze castings was similar.

Output per 1,000 hours worked of production workers producing bronze ship propellers decreased from * * * tons in 1981 to * * * tons in 1982 and 1983, then increased to * * * tons in 1984 and 1985.

In response to a question in the Commission's questionnaire, five producers reported that they reduced the number of production and related workers producing bronze ship propellers by at least 5 percent, or 50 workers, during the 1981-85 period. There were no reductions in 1981, reductions of 40 workers in 1982, 38 workers in 1983, 36 workers in 1984, and 30 workers in 1985. * * * accounted for nearly * * * percent of the reductions. * * * reported that it made the reductions owing to "market softness and loss of profitability due to import prices from Holland, Japan, and Mexico."

Workers at all of the responding firms were unionized with the exception of workers at Crown, Ellis Propeller, and Avondale's finishing facility.

Financial experience of U.S. producers

Operations on bronze ship propellers and all bronze castings.—Three firms, 4/ accounting for * * * percent of total U.S. production of bronze ship propellers in 1985, provided usable income-and-loss data on their bronze ship propeller operations and on their total bronze castings operations. One of the three firms was not able to provide these data prior to fiscal 1983; hence, data for this firm are presented separately. The data on bronze ship propeller operations and on total bronze casting operations for the two remaining firms are the same, since neither of the two firms produced any bronze castings other than bronze ship propellers. 5/

U.S. producers' total net sales of bronze ship propellers declined by * * * percent from $*** in 1981 to $*** in 1983 and then increased by * * * percent to $*** in 1984 (table III-5). In 1985 such sales dropped by * * * percent to $***.

1/ Excluding data for * * *, which was not able to report data on hours worked.

2/ Excluding 1982 data for * * *, which was not able to report data for 1981.

3/ Excluding data for * * *, which was not able to report data on hours worked.

4/ * * *.

5/ One firm made no allocations because it manufactures only bronze ship propellers. The other firm derived its costs of goods sold on the basis of its cost records and allocated GS&A expenses on the basis of sales dollars.

Table III-5.—Income-and-loss experience of 2 U.S. producers 1/ on their operations producing bronze ship propellers, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales————1,000 dollars——	***	***	***	***	***
Cost of goods sold————do————	***	***	***	***	***
Gross profit or (loss)——do———	***	***	***	***	***
General, selling, and administrative expenses 1,000 dollars——	***	***	***	***	***
Operating income or (loss) 1,000 dollars——	***	***	***	***	***
Interest expense—————do———	***	***	***	***	***
Other income or (expense) 1,000 dollars——	***	***	***	***	***
Net income or (loss) before income taxes 1,000 dollars——	***	***	***	***	***
Depreciation and amortization expense included above——————————do———	***	***	***	***	***
Cash flow from operations 2/——	***	***	***	***	***
As a share of net sales:					
Cost of goods sold percent——	***	***	***	***	***
Gross profit or (loss) percent——	***	***	***	***	***
General, selling, and administrative expenses percent——	***	***	***	***	***
Operating income or (loss) percent——	***	***	***	***	***
Net income or (loss) before income taxes percent——	***	***	***	***	***
Number of firms reporting operating losses——————————	0	0	0	0	0

1/ These firms accounted for * * * percent of total production of bronze ship propellers in 1985.

2/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

The responding firms operated profitably throughout the period under investigation. Aggregate operating income increased from $***, or * * * percent of net sales, in 1981 to $***, or * * * percent of net sales, in 1982. Such income then declined irregularly to $***, or * * * percent of net sales, in 1985. Net income before income taxes followed a trend similar to that of operating income.

Cash flow from operations increased from $*** in 1981 to $*** in 1982 and then dropped to $*** in 1983. Cash flow rose to $*** in 1984 and dropped to $*** in 1985.

Data for * * *, which accounted for * * * percent of total production of bronze ship propellers in 1985, are not included in the data presented in table III-5 because * * *. Reported income-and-loss data for this firm are shown in the following tabulation:

* * * * * * *

<u>Overall operations</u>.—Two U.S. producers of bronze ship propellers supplied financial data on their companies' overall or divisional operations for accounting years 1981-85. Net sales declined annually from $*** in 1981 to $*** in 1983, or by * * * percent, and then increased to $*** in 1985 (table III-6). Aggregate operating income, which dropped faster than net sales, fell by * * * percent from $*** in 1981 (* * * percent of net sales) to $*** in 1983 (* * * percent of net sales); such income rose to $*** (* * * percent of net sales) in 1984 and then declined to $*** (* * * percent of net sales) in 1985. Aggregate pretax net income margins followed a similar trend as the operating income margins.

<u>Financial condition of U.S. producers</u>.—Key balance sheet information and selected financial ratios of the two U.S. producers of bronze ship propellers that provided income-and-loss data on their overall or divisional operations are presented in table III-7.

A comparison of current assets with current liabilities provides an indication of the ability of the company to pay its short-term debts. One such indicator is the ratio of current assets to current liabilities, commonly known as the current ratio. The current ratio for the reporting producers increased from * * * in 1981 to * * * in 1982 and then declined to about * * * during 1983-85. A current ratio of 2.0 is normally considered adequate. Another primary indication of short-run solvency is working capital. Aggregate working capital increased from $*** in 1981 to about $*** during 1982-85. The net value of property, plant, and equipment increased from $*** in 1981 to $*** in 1982 and then declined to $*** in 1985. Total assets increased by * * * percent during 1981-84 and then declined by * * * percent in 1985.

The ratio of debt to equity indicates the relationship between capital provided by creditors and capital contributed by owners. A falling ratio indicates a decline in total liabilities relative to total equity. The ratio of debt to equity for the two firms declined by * * * percent during 1981-85.

The return-on-investment ratios measure the effectiveness of management in employing the resources available to it. The return is measured by various types of investment as presented in the table. All of the different measures of return on investment showed a similar trend, rising from 1981 to 1982, (except on equity), dipping to the lowest level in 1983, improving in 1984, though at a much lower level than in 1981 and 1982, and then dropping again in 1985.

Table III-6.—Income-and-loss experience of 2 U.S. producers of bronze ship propellers 1/ on their companies' overall or divisional operations, accounting years 1981-85

Item	1981	1982	1983	1984	1985
Net sales:					
Trade—1,000 dollars	***	***	***	***	***
Cost of goods sold—do	***	***	***	***	***
Gross profit—do	***	***	***	***	***
General, selling, and administrative expenses 1,000 dollars	***	***	***	***	***
Operating income or (loss) 1,000 dollars	***	***	***	***	***
Interest expense—do	***	***	***	***	***
Other income or (expense) 1,000 dollars	***	***	***	***	***
Net income or (loss) before income taxes 1,000 dollars	***	***	***	***	***
Depreciation and amortization expense included above 1,000 dollars	***	***	***	***	***
Cash flow from operations 2/ 1,000 dollars	***	***	***	***	***
As a share of net sales:					
Cost of goods sold percent	***	***	***	***	***
Gross profit or (loss) percent	***	***	***	***	***
General, selling, and administrative expenses percent	***	***	***	***	***
Operating income or (loss) percent	***	***	***	***	***
Net income or (loss) before income taxes—percent	***	***	***	***	***
Number of firms reporting operating losses	***	***	***	***	***
Number of firms reporting net losses	***	***	***	***	***

1/ These firms accounted for * * * percent of reported U.S. production of bronze ship propellers in 1985.

2/ Defined as pretax net income or loss plus depreciation and amortization expense.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table III-7.—Selected balance sheet and financial ratios of 2 U.S. producers 1/ of bronze ship propellers on their overall or divisional operations, as of the end of accounting years 1981-85

Item	1981	1982	1983	1984	1985
Total current assets 1,000 dollars	***	***	***	***	***
Property, plant, and equipment, net—1,000 dollars	***	***	***	***	***
Total assets—do	***	***	***	***	***
Total current liabilities 1,000 dollars	***	***	***	***	***
Long-term debt due after one year—1,000 dollars	***	***	***	***	***
Total liabilities—do	***	***	***	***	***
Equity—do	***	***	***	***	***
Working capital—do	***	***	***	***	***
Current ratio—times	***	***	***	***	***
Total debt to equity—do	***	***	***	***	***
Return on investment ratios:					
Pretax income or (loss) to—					
Equity—percent	***	***	***	***	***
Total assets—do	***	***	***	***	***
Invested capital 1/—do	***	***	***	***	***

1/ Invested capital is defined as working capital plus net property, plant, and equipment.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Investment in property, plant, and equipment.—Two U.S. producers provided data concerning their investment in facilities employed in the production of bronze ship propellers, as presented in the following tabulation (in thousands of dollars):

*   *   *   *   *   *   *

Aggregate investment in productive facilities, valued at cost, increased from $*** in 1981 to $*** in 1985. The book value of such facilities rose from $*** in 1981 to $*** in 1982 and then declined to $*** in 1985.

Capital expenditures and research and development expenses.—The capital expenditures and research and development expenses of two domestic producers on their bronze ship propeller operations are presented in the following tabulation (in thousands of dollars):

*   *   *   *   *   *   *

Capital expenditures increased from $*** in 1981 to $*** in 1983 and then dropped to $*** in 1984 and $*** in 1985. The two reporting producers did not incur any capital expenditures to comply with Government regulations during 1981-85. Research and development expenses rose steadily from $*** in 1981 to $*** in 1985.

Summary of operating income-and-loss data.—The ratios of operating income or loss to net sales reported by U.S. producers of bronze ship propellers and such producers' overall company or division operations are summarized in table III-8. For comparison, data are also presented for the comparable profitability ratios compiled by the Bureau of the Census for all manufacturing companies and all durable goods producers, and by Robert Morris Associates for ship and boat building and repairing.

Table III-8.—Ratios of operating income or loss to net sales for all manufacturing firms, all producers of durable goods, ship and boat building and repairing, and producers of bronze ship propellers, accounting years 1981-85

(In percent)

Item	1981	1982	1983	1984	1985
	Operating income or (loss) margin				
All manufacturing firms 1/	6.7	5.1	5.9	6.8	5.9
Manufacturers of durable goods 1/	6.5	4.1	5.0	6.6	5.4
Manufacturers of ship and boat building & repairing (SIC 3731 & 3732) 2/	4.6	5.7	2.2	0.9	3/
Producers of bronze ship propellers on their operations on—					
Bronze ship propellers as well as all bronze castings	***	***	***	***	***
Overall companies or divisions	***	***	***	***	***

1/ Derived from data published in Quarterly Financial Reports for Manufacturing, Mining, and Trade Corporations, Bureau of the Census.
2/ Compiled from 1985 Annual Statements Studies, Robert Morris Associates.
3/ Not available.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission, except as noted.

The Question of Threat of Serious Injury

Foreign producers

Available data on the capacity, production, sales, and exports of bronze ship propellers of countries exporting to the United States are presented in the introductory section of this report. The principal firms involved in the export of bronze ship propellers to the United States are believed to be Lips B.V. Propeller Works, Drunen, the Netherlands; Mitsubishi Heavy Industries, Japan; and Fundiciones Rice, Mexico.

* * *, Lips B.V. Propeller Works, started in 1928 as a ship propeller foundry and has since increased its size and range of products. Propeller works and joint ventures have been established in Brazil, France, Italy, Japan, Spain, and the United States, and propeller repair facilities are available throughout the world via Lips' network of representatives and travelling service engineers. Lips' range of marine products comprises monobloc propellers of all sizes and configurations, controllable pitch propellers, and other propulsion-related products.

Fundiciones Rice is located in the State of Sinaloa in Mexico. It is believed to be the only Mexican manufacturer and exporter of bronze ship propellers. Fundiciones Rice employs * * * persons. Approximately * * * percent of Fundiciones Rice's production currently consists of bronze ship propellers, down from * * * percent. 1/

U.S. inventories of imported metal castings

Only a few importers reported inventories of bronze ship propellers for any of the years covered by this investigation. Reported inventories amounted to * * * tons as of December 31, 1980, * * * tons as of December 31, 1981, * * * tons as of December 31, 1982, * * * tons as of December 31, 1983, * * * tons as of December 31, 1984, and 18 tons as of December 31, 1985. As in the case of domestic propellers, imported bronze ship propellers are ordered and manufactured abroad based on customer specifications and are generally not sold from inventory.

The Question of Imports as a Substantial Cause of Serious Injury or the Threat Thereof

Market penetration

U.S. imports of bronze ship propellers as a share of apparent U.S. consumption are shown in table III-9. The ratio of imports to apparent consumption increased to 5.3 percent in 1982, decreased in 1983 and 1984, and then increased to 11.8 percent in 1985.

1/ From the prehearing brief of Bregman, Abell, Kay and Simon, pp. 3 and 4.

Table III-9.—Bronze ship propellers: U.S. imports, apparent U.S. consumption, and ratios of imports to consumption, by types, 1981-85

Product	1981	1982	1983	1984	1985
U.S. imports——tons——	158	155	107	109	362
U.S. producers' domestic shipments ——do——	1/2,959	2,783	2,227	2,717	2,708
Apparent U.S. consumption ——do——	1/3,117	2,938	2,334	2,826	3,070
Ratio of imports to apparent U.S. consumption——percent——	2/ 5.1	5.3	4.6	3.9	11.8

1/ Excludes shipments of * * *, which was not able to provide shipment data for 1981.

2/ The ratio is overstated because U.S. producers' domestic shipment data in 1981 exclude data for * * *.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Prices

Besides weight and diameter, a number of other design factors can significantly affect a propeller's selling price. These factors include the number of blades, the blade configuration, the pitch, and the composition of the alloy used. Therefore, prices of domestic and imported propellers are often difficult to compare. Transportation costs are generally not included in the quoted price and are paid by the buyer. Delivery time varies from a couple of weeks to 6 months, depending on the size of the propeller and the backlog of the supplier.

Producers and importers were requested to provide the Commission with net per pound selling prices for propellers under 32 inches in diameter and for propellers over 10 feet in diameter. In addition to price, producers and importers provided the cast weight and propeller diameter for each sale. Data on large propellers with diameters of 10 feet and over are presented in table III-10. Only one domestic firm and three importers responded with prices for this category. Because of the size and the relatively small market for these propellers, firms will generally produce or import one or two items in a given 3-month period. The only propeller that was produced more than one time during the subject period was a * * *. This propeller was produced * * *. The price was steady at approximately $*** per pound from * * * to * * * before dropping to $*** per pound in * * *, increasing to $*** per pound in * * *, and dropping to $*** per pound in October-December 1985.

Only one domestic manufacturer and one importer that produce small propellers, with diameters under 32 inches, reported usable pricing information. These data are reported in table III-11. Like the large propellers, weight and diameters of the propellers varied widely. However,

Table III-10.—Bronze ship propellers over 10 feet in diameter: Producers' and importers' prices per pound, diameter, and cast weight, January-March 1981-October-December 1985

Period	Imported			U.S.-produced		
	Diameter	Cast weight	Price	Diameter	Cast weight	Price
	Feet	Pounds	Per pound	Feet	Pounds	Per pound
1981:						
Jan.-Mar	***	***	$***	***	***	$***
Apr.-June	1/	1/	1/	***	***	***
July-Sept	1/	1/	1/	***	***	***
Oct.-Dec	1/	1/	1/	***	***	***
1982:						
Jan.-Mar	1/	1/	1/	***	***	***
Apr.-June	1/	1/	1/	***	***	***
July-Sept	1/	1/	1/	***	***	***
Oct.-Dec	1/	1/	1/	***	***	***
1983:						
Jan.-Mar	1/	1/	1/	***	***	***
Apr.-June	1/	1/	1/	***	***	***
July-Sept	1/	1/	1/	***	***	***
Oct.-Dec	1/	1/	1/	***	***	***
1984:						
Jan.-Mar	1/	1/	1/	***	***	***
Apr.-June	***	***	***	1/	1/	1/
July-Sept	1/	1/	1/	***	***	***
Oct.-Dec	***	***	***	***	***	***
1985:						
Jan.-Mar	1/	1/	1/	1/	***	***
Apr.-June	***	***	***	1/	***	***
July-Sept	1/	1/	1/	1/	***	***
Oct.-Dec	1/	1/	1/	***	***	***

1/ Not reported.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

the reported data show a particular size propeller was sold on * * *. These propellers weigh * * * pounds, have a diameter of * * * inches, and were sold for $*** per pound in * * *. The price of the same propeller rose to $*** per pound in * * * before falling to $*** per pound in * * * and further declining to $*** per pound in * * *. Prices for these propellers then increased to $*** per pound in * * *.

Table III-11.--Bronze ship propellers under 32 inches in diameter: Producers' and importers' prices per pound, diameter, and cast weight, January-March 1981-October-December 1985

Period	Imported			U.S.-produced		
	Diameter	Cast weight	Price	Diameter	Cast weight	Price
	Inches	Pounds	Per pound	Inches	Pounds	Per pound
1981:						
Jan.-Mar	***	***	$***	***	***	$***
Apr.-June	***	***	***	***	***	***
July-Sept	***	***	***	***	***	***
Oct.-Dec	1/	1/	1/	***	***	***
1982:						
Jan.-Mar	1/	1/	1/	***	***	***
Apr.-June	***	***	***	***	***	***
July-Sept	***	***	***	***	***	***
Oct.-Dec	***	***	***	***	***	***
1983:						
Jan.-Mar	1/	1/	1/	***	***	***
Apr.-June	***	***	***	***	***	***
July-Sept	***	***	***	***	***	***
Oct.-Dec	***	***	***	***	***	***
1984:						
Jan.-Mar	***	***	***	***	***	***
Apr.-June	***	***	***	***	***	***
July-Sept	***	***	***	***	***	***
Oct.-Dec	***	***	***	***	***	***
1985:						
Jan.-Mar	***	***	***	***	***	***
Apr.-June	***	***	***	***	***	***
July-Sept	***	***	***	***	***	***
Oct.-Dec	***	***	***	***	***	***

1/ Not reported.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Although price comparisons between different propellers are virtually impossible because of a variety of design differences mentioned earlier, in a few periods similar propellers were sold by both importers and domestic manufacturers. During October-December 1982, an imported propeller weighing * * * pounds with a diameter of * * * inches sold for $*** per pound. During the same period a domestic producer also sold a propeller with a diameter of * * * inches. The U.S.-produced propeller weighed * * * pounds and sold for $*** per pound.

The price of the same U.S.-produced propeller rose to $*** per pound in October-December 1985, or by * * * percent. A similar imported propeller with a diameter of * * * inches was sold during the same period but it weighed only * * * pounds. The price of this propeller was $*** per pound.

Possible Causes of Injury Other Than Imports

Possible causes of injury other than imports include the following:

(1) a decline in shipbuilding in the United States;

(2) competition from a U.S. Government propeller manufacturing facility (Philadelphia Naval Shipyard); and

(3) Government regulations adversely affecting the competitive position of the U.S. propeller industry.

Decline in shipbuilding activity in the United States

Since 1981, the U.S. shipbuilding and repair industry has been experiencing a steady decline. The value of shipments fell by 13.0 percent between 1981 and 1985, as shown in the following tabulation (in millions of dollars): 1/

Year	Value of shipments
1981	11,001
1982	10,979
1983	9,487
1984	9,738
1985	1/ 9,575

1/ Estimated.

The figures presented above are for commercial and military vessels that generally use propellers having 3- to 35-foot diameters. The contraction in shipments is attributed to a marked decline in demand for new commercial tonnage, to competition from Asian countries, and to the elimination of the Construction Differential Subsidy by the U.S. Government.

Beginning in 1980, high interest rates, worldwide recessionary trends, and the economic uncertainty regarding the cost of fuel adversely affected worldwide demand for commercial ships and workboats. 2/ The number of commercial ships of 1,000 gross tons and larger under construction in U.S. yards in January of each year was 49 in 1981, 35 in 1982, 21 in 1983, 10 in 1984, and 6 in 1985. 3/ There reportedly were eight commercial ships under

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1/ U.S. Department of Commerce, 1986 U.S. Industrial Outlook, pp. 38-2 and 38-6.

2/ Workboats include barges, tugboats, and towboats for the inland and coastal water carrier industry; drill rigs, supply boats, and crew boats for the offshore service industry; and fishing vessels.

3/ Shipbuilders Council of America.

construction in January 1986, with a gross tonnage of 269,000 tons, compared with 1.2 million tons under construction in January 1981. 1/ The workboat sector of the industry did not fare any better. Despite the protection of the Jones Act, 2/ the industry is cyclical. Economic activity in this industry peaked in 1981, stimulated by optimistic predictions for vessel demand and favorable tax incentives. 3/ Demand, however, never reached expected levels. Whereas during previous economic cycles, downward trends affected only individual sectors of the industry, this time economic activity slowed in the industry as a whole. The reduction of offshore drilling rigs, which represented an important portion of the marine construction activity in recent years, also contributed to a diminishing workload for the domestic shipyards, 4/ as annual construction of petroleum service vessels and offshore/coastal/harbor tugs declined from 301 boats in 1981 to 42 in 1985. 5/ A large portion of the dry-bulk-ship fleet worldwide is also presently in excess supply because of a slowdown in international trade. 6/ Similar economic and political factors have adversely affected the shipping and commercial fishing activity of inland waterways.

U.S. Government spending on military shipbuilding and repair projects has provided some relief to shipbuilders but has failed to stem the ongoing contraction of the commercial sector. Between 1981 and 1983, the value of new military ship construction and repair work increased by 24 percent to an estimated $5.7 billion. Government procurement remained at the $5.7 billion level in 1984. Government procurement accounted for 91 percent of the total net sales volume in the shipbuilding and repair industry in 1984. 7/ Major military vessels of 1,000 light displacement tons and over under construction or on order as of October 1, 1985, totaled 76 ships, a decrease of 1 from the previous year. 8/

Another factor in the decline of shipbuilding and repair activity in the United States is the inability of domestic shipyards to compete in the international market. As of mid-1985, Japan was the world's largest ship supplier, commanding nearly 42 percent of the total deadweight tonnage (commercial and military) on order in commercial shipyards; the United States ranked ninth, with only 2 percent of the deadweight tonnage on order. The value of U.S. exports of ships and ship repairing services increased by 23 percent from 1981 to 1982, declined by 72 percent from 1982 to 1984, and then more than tripled from 1984 to 1985, as shown in the following tabulation (in millions of dollars): 9/

1/ U.S. Department of Commerce, 1986 U.S. Industrial Outlook, p. 38-1.

2/ The Jones Act requires that vessels used in domestic trade and for servicing the offshore industry be built in the United States.

3/ U.S. Department of Commerce, 1986 U.S. Industrial Outlook, p. 38-4.

4/ Analysis of the International Competitiveness of the U.S. Commercial Shipbuilding and Repair Industries, USITC Publication 1676, p. 43.

5/ From correspondence between * * * and the Fleet Data Service, furnished by * * * to Commission staff.

6/ J. Willoughby, "Shipwreck," Forbes, July 29, 1985.

7/ Analysis of the International Competitiveness of the U.S. Commercial Shipbuilding and Repair Industries, USITC Publication 1676, p. viii.

8/ U.S. Department of Commerce, 1986 U.S. Industrial Outlook, p. 38-2.

9/ Ibid., pp. 38-1 to 38-6.

Year	Exports
1981	559
1982	689
1983	506
1984	196
1985	1/ 620

1/ Estimated.

Lastly, U.S. commercial shipbuilding and repair activity has been adversely affected by the elimination of the Construction Differential Subsidy (CDS) by the U.S. Government. This subsidy allowed vessels used in foreign commerce to be built in the United States at cost parity with foreign yards. The vessels had to be manned by U.S. citizen crews, had to remain in use for 20 to 25 years, and the subsidy could not cover more than 50 percent of the domestic costs. The last vessel built under the Federal CDS program was delivered in January 1984. The CDS program has not been funded since September 1982, mainly because the Department of Transportation did not find it to be cost effective in promoting construction of commercial ships in U.S. shipyards. 1/

Competition from a U.S. Government propeller manufacturing facility

* * * has alleged that the U.S. Government is subsidizing the manufacture of bronze ship propellers at the Government's Philadelphia Naval Shipyard. This facility manufactures and tests propeller prototypes for military applications. * * * states that in recent years this Government facility has been engaged also in the production of propellers that could have been contracted out to the private sector. Contacts by the Commission staff with the U.S. Naval Sea Systems Command (NAVSEASYSCOM) have revealed that the Philadelphia Naval Shipyard manufactures * * *; furthermore, the Navy manufactures at the Philadelphia Shipyard * * *. The Philadelphia Naval Shipyard, in fact, is * * *. According to * * *, it would take considerable capitalization for any U.S. manufacturer to become competitive with the Philadelphia Navy Shipyard in the production of some types of propellers. The Philadelphia Naval Shipyard accounted for * * * percent of U.S. production of bronze ship propellers in 1981, * * * percent in 1982, * * * percent in 1983, * * * percent in 1984, and * * * percent in 1985.

Government regulations adversely affecting the competitive position of the U.S. propeller industry

U.S. Government regulations, such as enviromental and worker health and safety regulations, were perceived as hindering the U.S. industry's competitiveness. * * *, a petitioner, claims that regulations such as those imposed by the Occupational Safety and Health Administration have increased the cost of manufacturing propellers in the United States.

1/ Analysis of the International Competitiveness of the U.S. Commercial Shipbuilding and Repair Industries, USITC Publication 1676, p. 36.

U.S. Producers' Efforts to Compete With Imports

Four U.S. producers of bronze ship propellers reported on measures that they have taken to compete with imports. The four producers accounted for * * * percent of U.S. production in 1984 and * * * percent of U.S. production in 1985. A summary of the total expenditures 1/ made to compete more effectively is presented in the following tabulation (in thousands of dollars):

Type of expenditure	1981	1982	1983	1984	1985
Investments 1/	***	***	***	***	***
Cost reductions with existing equipment	***	***	***	***	***
Diversifications or expansions	***	***	***	***	***
Technological improvements	***	***	***	***	***
Organizational changes	***	***	***	***	***
Marketing changes	-	-	***	***	***
All other expenditures	***	***	***	***	***
Total	***	***	***	***	***

1/ Investments in new equipment, in new facilities, and in other measures to improve competitiveness. Some of the items listed by firms under "investments" may more properly have been listed under other categories of expenditures.

A summary of the responses of each of the five major producers of bronze ship propellers in 1985 (* * *) to the question on measures that they have taken to compete with imports is presented below. 2/ The five producers accounted for * * * percent of U.S. production of bronze ship propellers in 1985.

* * * reported expenditures of $*** during the 1981-85 period to compete more effectively in the U.S. bronze ship propeller market. In 1981 * * * invested $*** to * * *. * * * also invested $*** to upgrade equipment, improve flexibility, and reduce handling time in its bronze ship propeller operations. Investments were made totalling $*** on general upgrading of equipment for the production of bronze ship propellers. In addition, over the 1981-85 period, * * * spent $*** to make cost reductions on existing equipment; $*** for * * *; and $*** to improve and introduce new molding procedures and upgrade propeller design capabilities. * * * made organizational changes, * * *, and marketing improvements, such as a free propeller evaluation program and improved marketing efforts and distributor networks.

1/ In instances where a producer reported expenditures over more than one year, it has been assumed that the expenditures were equal in each of the years.

2/ In addition to the five major producers, * * * reported expenditures of $*** during the 1981-85 period to compete more effectively in the U.S. bronze ship propeller market. * * * reported investments for various technological improvements amounting to $*** in 1981, $*** in 1982, and $*** in 1983. * * * also reported a reduction in its managerial staff and various concessions in salary and benefits made by its union.

*   *   *   *   *   *   *

* * * reported expenditures of $*** during the 1981-85 period to compete more effectively in the U.S. bronze ship propeller market. * * * indicated that it invested $*** in new equipment in its foundry and machine shop in * * *. * * * also made investments of $*** to * * *. * * * stated that all the above investments were made because "* * *." * * * stated that it took on the * * * in order to absorb fixed overhead and to retain its skilled labor force. * * * made tooling and refurbishing investments of $*** for cost reduction on existing equipment in * * *. * * * spent $*** in * * * for new computer equipment for its propeller programs and $*** in * * * for organizational changes (addition of new supervisors and a quality controls department). * * * marketing improvements include the appointment of * * * and an increased advertising budget of $*** in * * *; * * *. * * * also stated that it began a "* * *" in * * *, which reportedly helped it to compete more favorably against imports, although this advantage "* * *."

* * * accounted for * * * percent of reported expenditures during the 1981-85 period. * * * made the following investments to compete more effectively in the U.S. bronze ship propeller market:

*   *   *   *   *   *   *

* * * did not indicate whether it has made expenditures to compete more effectively in the U.S. bronze ship propeller market.

U.S. Producers' Planned Adjustments If Relief Is Granted

Presented below are the responses of the producers of bronze ship propellers to a question in the Commission's questionnaire on what adjustments responding firms would make if temporary relief under section 201 is granted (assuming relief of a 50-percentage point increase in tariffs for 5 years):

* * * indicated that it does not have a plan to undertake specific adjustments if temporary relief under section 201 is granted. * * * stated that "* * *." "* * *." "* * *."

* * * indicated that it does have a plan to undertake specific adjustments if temporary relief under section 201 is granted. * * * intends to spend $*** to * * *. * * * detailed the specific competitive advantages of each of the intended investments, and added that "* * *." * * * also intends, if relief is granted, to spend $*** for * * *. * * *.

* * * indicated that it does have a plan to undertake specific adjustments if temporary relief under section 201 is granted, but also indicated that "* * *." * * *. "* * *." "* * *."

* * * indicated that it does have a plan to undertake specific adjustments if temporary relief under section 201 is granted. * * * intends to spend $*** to * * *. * * * also intends to arrange for * * *. * * *. * * *, "* * *."

*   *   *   *   *   *   *

* * * stated that it intends to continue its program to automate * * *. Its program consists of an intent to install a $*** * * *. * * * also stated that "* * *."

APPENDIX A

NOTICE OF THE COMMISSION'S INVESTIGATION

[Investigation No. TA-201-58]

Certain Metal Castings; Notice of Investigation

AGENCY: International Trade Commission.

ACTION: Institution of an investigation under section 201 of the Trade Act of 1974 (19 U.S.C. 2251) and scheduling of a hearing to be held in connection with the investigation.

SUMMARY: Following receipt of a petition filed on December 2, 1985, and amended on December 12, 1985, and December 18, 1985,[1] on behalf of the Cast Metals Federation, the United States International Trade Commission instituted investigation No. TA-201-58 under section 201 of the Trade Act of 1974 to determine whether the following metal castings, whether or not advanced beyond cleaning, and whether or not machined beyond the removal of fins, gates, sprues, and risers or to permit location in finishing machinery, are being imported into the United States in such increased quantities as to be a substantial cause of serious injury, or the threat thereof, to the domestic

[1] The amendments principally expand the scope of the petition to include imports from Canada of certain covered products that enter duty-free as original motor-vehicle equipment and, with respect to all covered products, imports that have been machined.

industry producing articles like or directly competitive with the imported articles:

Iron castings and ductile iron castings:

Construction castings, specifically, manhole covers, rings, and frames, catch basin grates and frames, cleanout covers and frames, and valve, service, and meter boxes, provided for in items 657.09, 657.10, and 657.25 of the Tariff Schedules of the United States (TSUS);

Pressure pipe fittings for water mains, provided for in TSUS items 610.62, 610.63, 610.70, 610.71, 610.74, and 610.82;

Housings for compressors, provided for in TSUS item 661.10; and

Brake drums and rotors, provided for in TSUS items 692.32 and 692.33.

Steel castings:

Parts of valves, including the bodies (or "shells"), bonnets, stems, wedges, handles, and seat rings, provided for in TSUS items 680.17, 680.25, and 680.27; and

Parts for construction equipment, tractors, and trucks, specifically:

Axle parts, including housings and spindles, for off-highway heavy construction vehicles, provided for in TSUS item 664.08;

Levers for front end loaders and crawler tractors, provided for in TSUS item 664.08;

Drive sprockets for track-laying construction machinery and tracklaying tractors, provided for in TSUS items 664.08, 692.34, and 692.35;

Beam hanger brackets for classes 6, 7, and 8 on-highway trucks, provided for in TSUS items 692.32 and 692.33; and

Sockets and suspension brackets for 5-ton military trucks, provided for in TSUS item 692.32.

Bronze castings:

Ship propellers, provided for in TSUS items 657.35, 678.50, and 696.15.

The Commission will make its determination in this investigation by June 2, 1986 (see section 201(d)(2) of the act (19 U.S.C. 2251(d)(2))).

For further information concerning the conduct of this investigation, hearing procedures, and rules of general application, consult the Commission's rules of practice and procedure, part 206, subparts A and B (19 CFR part 206), and part 201, subparts A through E (19 CFR part 201).

EFFECTIVE DATE: December 2, 1985.

FOR FURTHER INFORMATION CONTACT: Robert Carpenter (202-523-0399) or George Deyman (202-523-0481), Office of Investigations, U.S. International Trade Commission, 701 E Street NW., Washington, DC 20436. Hearing-impaired individuals are advised that information on this matter can be obtained by contacting the Commission's TDD terminal on 202-724-0002.

SUPPLEMENTARY INFORMATION:

Participation in the investigation.—Persons wishing to participate in the investigation as parties must file an entry of appearance with the Secretary to the Commission, as provided in § 201.11 of the Commission's rules (19 CFR 201.11), not later than twenty-one (21) days after publication of this notice in the **Federal Register**. Any entry of appearance filed after this date will be referred to the Chairwoman, who will determine whether to accept the late entry for good cause shown by the person desiring to file the entry.

Service list.—Pursuant to § 201.11(d) of the Commission's rules (19 CFR 201.11(d)), the Secretary will prepare a service list containing the names and addresses of all persons, or their representatives, who are parties to this investigation upon the expiration of the period for filing entries of apperance. In accordance with § 201.16(c) of the rules (19 CFR 201.16(c)), each document filed by a party to the investigation must be served on all other parties to the investigation (as identified by the service list), and a certificate of service must accompany the document. The Secretary will not accept a document for filing without a certificate of service.

Hearing.—The Commission will hold a hearing in connection with this investigation beginning at 10:00 a.m. on March 18, 1986, at the U.S. International Trade Commission Building, 701 E Street NW., Washington, DC. Requests to appear at the hearing should be filed in writing with the Secretary to the Commission not later than the close of business (5:15) p.m.) on March 5, 1986. All persons desiring to appear at the hearing and make oral presentations, with the exception of public officials and persons not represented by counsel, should file prehearing briefs and attend a prehearing conference to be held at 9:30 a.m. on March 11, 1986, in room 117 of the U.S. International Trade Commission Building. The deadline for filing prehearing briefs is March 12, 1986. Petitioners are encouraged to include in their prehearing brief a detailed discussion of the proposed remedy and its effects. Other parties and also invited to address the issue of remedy in their prehearing briefs. Posthearing briefs must be submitted not later than the close of business on March 28, 1986. Confidential material should be filed in accordance with the procedures described below.

Parties are encouraged to limit their testimony at the hearing to a nonconfidential summary and analysis of material contained in prehearing briefs and to information not available at the time the prehearing brief was submitted. Any written materials submitted at the hearing must be filed in accordance with the procedures described below and any confidential materials must be submitted at least three (3) working days prior to the hearing (see § 201.6(b)(2) of the Commission's rules (19 CFR 201.6(b)(2))).

Written submissions.—As mentioned, parties to this investigation may file prehearing and posthearing briefs by the dates shown above. In addition, any person who has not entered an appearance as a party to the investigation may submit a written statement of information pertinent to the subject of the investigation on or before March 28, 1986. A signed original and fourteen (14) copies of each submission must be filed with the Secretary to the Commission in accordance with § 201.8 of the Commission's rules (19 CFR 201.8). All written submissions except for confidential business data will be available for public inspection during regular business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary to the Commission.

Any business information for which confidential treatment is desired shall be submitted separately. The envelope and all pages of such submissions must be clearly labeled "Confidential Business Information." Confidential submissions and requests for confidential treatment must conform with the requirements of § 201.6 of the Commission's rules (19 CFR 201.6).

Remedy.—In the event that the Commisson makes an affirmative injury determination in this investigation, remedy briefs will be due to the Secretary no later than the close of business on May 12, 1986, and must conform with the requirements of § 201.6 of the Commission's rules. Parties are reminded that no separate hearing on the issue of remedy will be held. Those parties wishing to present oral arguments on the issue of remedy may do so at the hearing scheduled for March 18, 1986.

Authority: This investigation is being conducted under the authority of section 201 of the Trade Act of 1974. This notice is published pursuant to § 201.10 of the Commission's rules (19 CFR 201.10).

By order of the Commission.

Issued: December 27, 1985.

Kenneth R. Mason,

Secretary.

[FR Doc. 85-31036 Filed 12-31-85; 8:45 am]

BILLING CODE 7020-02-M

APPENDIX B

LIST OF WITNESSES APPEARING AT THE PUBLIC HEARING

TENTATIVE CALENDAR OF PUBLIC HEARING

Those listed below appeared as witnesses at the United States International Trade Commission's hearing on:

Subject : Certain Metal Castings

Inv. No. : TA-201-58

Date and time: March 18, 1986 - 10:00 a.m.

Sessions were held in the Hearing Room of the United States International Trade Commission, 701 E Street, N.W., in Washington.

Congressional appearances:

Honorable Donald J. Pease, United States Representative, State of Ohio

Honorable Joseph P. Kolter, United States Representative, State of Pennsylvania

IN SUPPORT OF THE PETITION:

International Molders and Allied Workers Union, Cincinnati, Ohio

Bernard Butsavage, President

Thorp, Reed & Armstrong--Counsel
Washington, D.C.
on behalf of

Cast Metals Federation

E. William Aylward, Neenah Foundry Company

William F. Burke, Vulcan Foundry, Inc.

John A. Warner, Tyler Pipe Industries, Inc.

Dale Meador, Tyler Pipe Industries, Inc.

Alain B. Brown, Amcast Industrial Corporation

Thorp, Reed & Armstrong--continued

Albert W. Gruer, Jr., Waupaca, Wisconsin

Harry V. Rossi, Adirondack Steel Casting Company, Inc.

John M. Giba, National Castings, Inc.

William Baker, National Castings, Inc.

Charles A. Orem, Bird-Johnson Company

Bernard Ames, Ferguson Propeller, Inc.

Dr. Michael D. Bradley, Economic Consultant, The George Washington University

Roger M. Bolden)
Preston T. Scott)--OF COUNSEL
Lee Heywood Pelton)

<u>In opposition to the petition</u>:

Klayman & Gurley, P.C.--Counsel
Washington, D.C.
<u>on behalf of</u>

The Association of Castings Importers of America, Inc.

Tim Gollin, Southwestern Commercial Corporation

Mark Abrams, City Pipe & Foundry

Jay Malani, Southern Star

R. K. Kajaria, Cast Products, Inc.

Larry Klayman)
John Gurley)--OF COUNSEL

Donovan, Leisure, Newton & Irvine--Counsel
New York, N.Y.
<u>on behalf of</u>

The Syndicat General des Fondeurs de France (the French Foundry Producers' Association)

Pierre F. de Ravel d'Esclapon--OF COUNSEL

- more -

Brownstein, Zeidman and Schomer--Counsel
Washington, D.C.
on behalf of

Ad Hoc Group - South Bay Foundry, Creswell Trading Company, Long Beach Iron Works and D&L Supply

John F. Myers, President, South Bay Foundry

Jack Heath, Sather Manufacturing Company

Irwin Altshuler)
Donald S. Stein)--OF COUNSEL

O'Melveny & Myers--Counsel
Washington, D.C.
on behalf of

The Canadian Foundry Association

Peter Kenney, President, Neelon Casting, Ltd.

Ray White, President, Bibby-Ste. Croix Foundries, Inc.

Gordon G. Jacox, Vice President and Division Manager, Fahramet

William F. Finan, Quick, Finan & Associates

Gary N. Horlick)
John D. Holum)--OF COUNSEL
Sheila Landers)

Graham & James--Counsel
Washington, D.C.
on behalf of

Hitachi Metals America, a division of Hitachi Metals International Ltd.

James L. Kauffman, Hitachi Metals America

William F. Finan, Quick, Finan & Associates

Michael A. Hertzberg)
Lawrence R. Walders)--OF COUNSEL
Stuart E. Benson)

- more -

Mudge, Rose, Guthrie, Alexander & Ferdon--Counsel
Washington, D.C.
on behalf of

Korea Foundry Forging Cooperative Association
and
Nappco, Inc., Northborough, Massachusetts

Charles Roach, President, Nappco, Inc.

John Bramblett Cooper Valve Company

Charles Roach, President, Nappco, Inc.

John Bramblett, Cooper Valve Company

Donald B. Cameron)--OF COUNSEL
Julie C. Mendoza)

Porter, Wright, Morris & Arthur--Counsel
Dayton, Ohio
on behalf of

Copeland Corporation, a manufacturer of air conditioning and commercial refrigerators

James Sperl, Corporate Transportation

Jon M. Sebaly--OF COUNSEL

Freeman, Wasserman & Schneider--Counsel
Washington, D.C.
on behalf of

Associacao Brasilerira de Fundicao (Brazilian Foundry Association)

David L. Aelion, a Director of ABIFA

Jack Gumpert Wasserman)
Philip Yale Simons)--OF COUNSEL
Patrick C. Reed)

Kaplan, Russin & Vecchi--Counsel
Washington, D.C.
on behalf of

The Engineering Export Promotion Council of India (EEPC)

Dennis James, Jr.--OF COUNSEL

Ablondi & Foster, P.C.--Counsel
Washington, D.C.
on behalf of

The Ad Hoc Committee of Producers of Metal Castings of the Republic of China on Taiwan

Sturgis M. Sobin--OF COUNSEL

Ross & Hardies--Counsel
Washington, D.C.
on behalf of

The Association Professionnelle de L'Acier Moule de France (French Professional Association for Steel Castings)

Cathryn Goddard, Ph.D., Gregoire Genot, Economic Consultant, International Resources Group

Stephen M. Creskoff)
James A. Stenger)--OF COUNSEL

Arnold & Porter--Counsel
Washington, D.C.
on behalf of

Komatsu American Corporation

Spencer S. Griffith)
Hiro Kamano)--OF COUNSEL

Lips Propellers, Inc., Headquarters/East Coast Operations

Robert F. Kress, President

Bregman, Abell, Kay & Simon--Counsel
Washington, D.C.
on behalf of

Mexican Exporters of Malleable Cast Iron Pipe Fittings and Bronze Ship Propellors

Leslie Alan Glick--OF COUNSEL

APPENDIX C

PREVIOUS COMMISSION INVESTIGATIONS ON IRON AND DUCTILE-IRON CONSTRUCTION CASTINGS

The Commission and the Department of Commerce have conducted several statutory investigations on iron and ductile iron construction castings during the 1980-85 period. These investigations and their outcomes are discussed herein.

On February 19, 1980, the Commission and the Department of Commerce received a petition from Pinkerton Foundry, Inc., Lodi, CA, alleging that bounties or grants were being paid with respect to certain iron construction castings imported from India. On August 14, 1980, following its investigation, Commerce issued a final countervailing duty determination that the Government of India was granting bounties or grants ranging from 12.9 to 16.8 percent of the f.o.b. India price. 1/ On September 29, 1980, the Commission determined in investigation No. 303-TA-13 (Final) that an industry in the United States was materially injured or threatened with material injury by reason of imports of the iron construction castings from India that were subject to the Commerce subsidy determination.

On November 19, 1980, the Commission and the Department of Commerce received a petition from Pinkerton Foundry, Inc., alleging that certain iron construction castings from India were being, or were likely to be, sold in the United States at LTFV. On December 18, 1980, the Commission determined that there was a reasonable indication that an industry in the United States was materially injured, or threatened with material injury, by reason of the alleged LTFV imports from India. However, the Department of Commerce subsequently issued a negative determination as to the existence of LTFV sales and the investigation was terminated (46 F.R. 39871).

On September 10, 1982, the Department of Commerce received a petition from counsel on behalf of 11 domestic manufacturers of certain iron-metal construction castings alleging that bounties or grants were being paid with respect to such products imported from Mexico. 2/ Commerce issued a final countervailing duty determination on February 7, 1983, that certain benefits which constitute bounties or grants, in the amount of 2.85 percent ad valorem, were being provided to manufacturers, producers, or exporters of certain iron-metal construction castings in Mexico. In 1984, at the request of the petitioner, Commerce conducted an administrative review of the countervailing duty order. As a result of the review, Commerce reached a preliminary determination that the bounty or grant was 0.37 percent ad valorem for the period of review (50 F.R. 43262).

On May 13, 1985, the Municipal Castings Fair Trade Council, a trade association representing 15 domestic producers of iron construction castings, filed petitions with the U.S. International Trade Commission and the U.S. Department of Commerce. The petitions alleged that an industry in the United States is materially injured and is threatened with further material injury by reason of imports from Brazil of certain iron construction castings, provided for in TSUS item 657.09, which were allegedly being subsidized by the Government of Brazil, and by reason of imports from Brazil, Canada, India, and the People's Republic of China (China) of such castings which were allegedly

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1/ This countervailing duty has subsequently been reduced. The current countervailing duty being applied to imports of iron construction castings from India is 2.19 percent.

2/ Inasmuch as Mexico was not at that time a "country under the Agreement," the Commission was not required to make an injury determination.

being sold at less than fair value (LTFV). Accordingly, the Commission instituted preliminary investigations (No. 701-TA-249 (Preliminary) and Nos. 731-TA-262 through 265 (Preliminary)) under the provisions of the Tariff Act of 1930.

As a result of its preliminary investigations, the Commission, on July 3, 1985, notified Commerce that there was a reasonable indication that an industry in the United States was materially injured by reason of imports of certain heavy iron construction castings from Brazil, which were alleged to be subsidized by the Government of Brazil. At the same time, the Commission determined 1/ that there was no reasonable indication that an industry in the United States was materially injured or threatened with material injury, or that the establishment of an industry in the United States was materially retarded, by reason of imports from Brazil of certain light iron construction castings which were alleged to be subsidized by the Government of Brazil. The Commission further determined that there was a reasonable indication that industries in the United States were materially injured by reason of imports from Brazil, Canada, India, and China of certain heavy and light iron construction castings which were alleged to be sold at LTFV.

On August 12, 1985, Commerce published in the Federal Register (50 F.R. 32462) its preliminary determination that imports of certain heavy iron construction castings from Brazil are receiving certain benefits from the Government of Brazil which constitute subsidies within the meaning of the countervailing duty law. As a result of Commerce's affirmative preliminary determination of subsidized sales from Brazil, the Commission instituted investigation No. 701-TA-249 (Final) to determine whether an industry in the United States is materially injured or is threatened with material injury, or whether the establishment of an industry in the United States is materially retarded, by reason of subsidized imports from Brazil of certain heavy iron construction castings.

On October 28, 1985, Commerce published in the Federal Register (50 F.R. 43591) its affirmative preliminary determinations that imports of certain iron construction castings from Brazil, Canada, India, and China are being, or are likely to be, sold in the United States at LTFV within the meaning of section 733 of the Act. As a result of these determinations, the Commission instituted investigations Nos. 731-TA-262 through 265 (Final) to determine whether an industry in the United States is materially injured or is threatened with material injury, or whether the establishment of an industry in the United States is materially retarded, by reason of LTFV imports from Brazil, Canada, India, and China of certain iron construction castings.

The Commission's hearing in connection with these investigations was held in Washington, DC, on January 16, 1986. Commerce made final affirmative LTFV and subsidy determinations with respect to all of the investigations and products for which the Commission had made preliminary affirmative injury determinations. On February 19, 1986, the Commission transmitted its final affirmative injury determination in the investigation on Canada to the Department of Commerce; and on April 25, 1986, the Commission transmitted its final affirmative injury determinations in the investigations concerning Brazil, India, and China.

1/ Chairwoman Stern and Commissioner Eckes dissenting.

APPENDIX D

U.S. IMPORTS

Table D-1.—Certain iron castings: U.S. imports for consumption, by types, 1981-85

Item	1981	1982	1983	1984	1985
	Quantity (tons) 1/				
Construction castings:					
Rough castings	9,702	11,300	24,246	40,322	47,157
Advanced castings	10,980	13,567	17,591	26,577	30,606
Total	20,682	24,867	41,837	66,899	77,763
Pipe fittings:					
Rough castings:					
Ductile	***	***	***	***	1,513
Other	***	***	***	***	1,907
Subtotal	***	***	***	***	3,420
Advanced castings:					
Ductile	***	***	***	***	4,371
Other	***	***	***	***	2,803
Subtotal	***	***	***	***	7,174
Total	***	4,148	4,136	6,355	10,594
Compressor housings:					
Rough castings	***	***	***	***	***
Advanced castings	***	***	***	***	***
Total	1,876	978	720	1,761	2,168
Brake drums and rotors:					
Rough castings	17,051	22,575	29,298	28,869	54,643
Advanced castings	9,815	8,710	20,578	32,339	36,494
Total	26,866	31,285	49,876	61,208	91,137
	Value (1,000 dollars)				
Construction castings:					
Rough castings	4,071	4,578	10,091	18,027	20,175
Advanced castings	4,669	5,742	7,811	16,303	17,263
Total	8,740	10,320	17,902	34,330	37,438
Pipe fittings:					
Rough castings:					
Ductile	***	***	***	***	1,528
Other	***	***	***	***	1,681
Total, rough	***	***	***	***	3,209
Advanced castings:					
Ductile	***	***	***	***	4,958
Other	***	***	***	***	2,700
Total, advanced	***	***	***	***	7,658
Total	***	3,764	4,190	7,610	10,867
Compressor housings:					
Rough castings	***	***	***	***	***
Advanced castings	***	***	***	***	***
Total	***	1,304	1,052	1,516	2,080
Brake drums and rotors:					
Rough castings	12,139	15,670	19,800	21,716	39,216
Advanced castings	13,558	12,113	24,623	36,472	41,638
Total	25,697	27,783	44,423	58,188	80,854

See footnotes at end of table.

Table D-1.—Certain iron castings: U.S. imports for consumption, by types, 1981-85—Continued

Item	1981	1982	1983	1984	1985
	Unit value (per ton)				
Construction castings:					
Rough castings	$420	$405	$416	$447	$428
Advanced castings	425	423	444	613	564
Average	423	415	428	513	481
Pipe fittings:					
Rough castings:					
Ductile	***	***	***	***	1,010
Other	***	***	***	***	881
Average	***	***	***	***	938
Advanced castings:					
Ductile	***	***	***	***	1,134
Other	***	***	***	***	963
Average	***	***	***	***	1,067
Average	***	907	1,013	1,197	1,026
Compressor housings					
Rough castings	***	***	***	***	***
Advanced castings	***	***	***	***	***
Average	***	1,333	1,461	861	959
Brake drums and rotors:					
Rough castings	712	694	676	752	718
Advanced castings	1,381	1,391	1,197	1,128	1,141
Average	956	888	891	951	887

1/ All firms reporting imports of compressor housings and advanced brake drums and rotors provided data on both tonnage and units imported. However, one of the six firms providing import data on rough brake drums and rotors was unable to provide units; the remaining five firms accounted for virtually all (over 99 percent) of the reported tonnage imported during 1981-85. The number of units of rough and advanced compressor housings and rough and advanced brake drums and rotors reported by importing firms is shown in the following tabulation:

	Compressor housings		Brake drums and rotors	
	Rough	Advanced	Rough	Advanced
1981	***	***	1,545,014	926,100
1982	***	***	2,199,176	786,166
1983	***	***	2,918,767	1,659,374
1984	***	***	3,222,767	2,477,861
1985	***	***	5,380,734	2,975,445

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table D-2.--Construction castings: U.S. imports for consumption, by types and by sources, 1985

Product and source	Quantity	Value	Unit value
	Tons	1,000 dollars	Per ton
Rough castings:			
Brazil	***	***	$***
Canada	10,461	5,553	531
China	***	***	***
India	26,038	10,342	397
Mexico	***	***	***
Total	47,157	20,175	428
Advanced castings:			
Brazil	***	***	***
Canada	4,906	2,716	554
China	***	***	***
France	***	***	***
India	13,989	6,043	432
Mexico	***	***	***
Republic of Korea	***	***	***
Total	30,606	17,263	564
Total castings:			
Brazil	8,239	3,036	368
Canada	15,367	8,269	538
China	8,171	3,483	426
France	***	***	***
India	40,027	16,385	409
Mexico	***	***	***
Republic of Korea	***	***	***
Total	77,763	37,438	481

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table D-3.—Pipe fittings: U.S. imports for consumption, by types and by sources, 1985

Product and source	Quantity	Value	Unit value
	Tons	1,000 dollars	Per ton
Rough castings:			
Ductile:			
China	***	***	$***
Republic of Korea	747	734	983
Spain	***	***	***
Total	1,513	1,528	1,010
Other:			
Canada	***	***	***
China	***	***	***
India	***	***	***
Republic of Korea	***	***	***
Total	1,907	1,681	881
Advanced castings:			
Ductile:			
Republic of Korea	4,371	4,958	1,134
Other:			
Canada	***	***	***
India	***	***	***
Republic of Korea	***	***	***
Total	2,803	2,700	963
Total castings:			
Ductile:			
China	***	***	***
Republic of Korea	5,118	5,692	1,112
Spain	***	***	***
Total	5,884	6,486	1,102
Other:			
Canada	***	***	***
China	***	***	***
India	***	***	***
Republic of Korea	2,445	2,519	1,030
Total	4,710	4,381	930
Grand total	10,594	10,867	1,026

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table D-4.—Compressor housings: U.S. imports for consumption, by types and by sources, 1985

Product and source	Quantity		Value	Unit value
	Units	Tons		
			1,000 dollars	Per ton
Rough castings:				
Brazil	***	***	***	$***
Canada	***	***	***	***
Italy	***	***	***	***
Republic of Korea	***	***	***	***
United Kingdom	***	***	***	***
Total	***	***	***	***
Advanced castings:				
Brazil	***	***	***	***
Republic of Korea	***	***	***	***
United Kingdon	***	***	***	***
West Germany	***	***	***	***
Total	***	***	***	***
Total castings:				
Brazil	***	***	***	***
Canada	***	***	***	***
Italy	***	***	***	***
Republic of Korea	***	***	***	***
United Kingdom	***	***	***	***
West Germany	***	***	***	***
Total	***	2,168	2,080	959

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table D-5.—Brake drums and rotors: U.S. imports for consumption, by types and by sources, 1985

Product and source	Quantity		Value	Unit value
	Units	Tons		
			1,000 dollars	Per ton
Rough castings (Canada)	5,380,734	54,643	39,216	$718
Advanced castings:				
Canada	1,053,776	13,341	14,092	1,056
France	***	***	***	***
Italy	***	***	***	***
Japan	476,441	2,693	5,801	2,154
Mexico	1,150,019	18,576	19,055	1,026
Sweden	***	***	***	***
Taiwan	***	***	***	***
West Germany	***	***	***	***
Total	2,975,445	36,494	41,638	1,141
Total castings:				
Canada	6,434,510	67,984	53,308	784
France	***	***	***	***
Italy	***	***	***	***
Japan	476,441	2,693	5,801	2,154
Mexico	1,150,019	18,576	19,055	1,026
Sweden	***	***	***	***
Taiwan	***	***	***	***
West Germany	***	***	***	***
Total	8,356,179	91,137	80,854	887

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table D-6.—Cast steel axle parts: U.S. imports, by types and by sources, 1985

Product and source	Quantity	Value	Unit value
	Tons	1,000 dollars	Per ton
Axle parts:			
Rough castings:			
Japan	***	***	$***
Spain	***	***	***
All other 1/	***	***	***
Subtotal or average	***	***	***
Advanced castings:			
Japan	0	-	-
Spain	***	***	***
All other	0	-	-
Subtotal or average	***	***	***
Total castings:			
Japan	***	***	***
Spain	***	***	***
All other 1/	***	***	***
Total or average	1,649	2,797	1,696

1/ Italy and the United Kingdom.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table D-7.—Cast steel levers: U.S. imports, by types and by sources, 1985

Product and source	Quantity	Value	Unit value
	Tons	1,000 dollars	Per ton
Levers:			
Rough castings:			
France	***	***	$***
Japan	***	***	***
Subtotal or average	***	***	***
Advanced castings:			
France	0	-	-
Japan	***	***	***
Subtotal or average	***	***	***
Total castings:			
France	***	***	***
Japan	***	***	***
Total or average	***	***	***

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table D-8.—Cast steel drive sprockets: U.S. imports, by types and by sources, 1985

Product and source	Quantity	Value	Unit value
	Tons	1,000 dollars	Per ton
Drive sprockets:			
Rough castings:			
Italy	***	***	$***
Japan	***	***	***
Spain	0	–	–
West Germany	0	–	–
Subtotal or average	***	***	***
Advanced castings:			
Italy	***	***	***
Japan	0	–	–
Spain	***	***	***
West Germany	***	***	***
Subtotal or average	***	***	***
Total castings:			
Italy	***	***	***
Japan	***	***	***
Spain	***	***	***
West Germany	***	***	***
Total or average	882	1,705	1,933

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table D-9.—Beam hanger brackets: U.S. imports, by types and by sources, 1985

Product and source	Quantity	Value	Unit value
	Tons	1,000 dollars	Per ton
Beam hanger brackets:			
Rough castings:			
Brazil	***	***	$***
Canada	***	***	***
Japan	0	-	-
Spain	***	***	***
Subtotal or average	***	***	***
Advanced castings:			
Brazil	0	-	-
Canada	***	***	***
Japan	***	***	***
Spain	***	***	***
Subtotal or average	***	***	***
Total castings:			
Brazil	***	***	***
Canada	***	***	***
Japan	***	***	***
Spain	***	***	***
Total or average	1,659	3,685	2,221

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table D-10.—Sockets and suspension brackets: U.S. imports, by types and by sources, 1985

Product and source	Quantity	Value	Unit value
	Tons	1,000 dollars	Per ton
Sockets and suspension brackets:			
Rough castings:			
Argentina	***	***	$***
Advanced castings:			
Argentina	***	***	***
Total castings:			
Argentina	***	***	***

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table D-11.—Parts of valves: U.S. imports, by types and by sources, 1985

Product and source	Quantity	Value	Unit value
	Tons	1,000 dollars	Per ton
Parts of valves:			
Rough castings:			
Austria	***	***	$***
Brazil	***	***	***
Canada	***	***	***
France	***	***	***
Japan	***	***	***
Mexico	***	***	***
Portugal	***	***	***
Republic of Korea	***	***	***
Spain	***	***	***
Taiwan	***	***	***
United Kingdom	***	***	***
All other	***	***	***
Subtotal or average	5,449	11,510	2,112
Advanced castings:			
Austria	***	***	***
Brazil	0	-	-
Canada	***	***	***
France	***	***	***
Japan	***	***	***
Mexico	***	***	***
Portugal	0	-	-
Republic of Korea	***	***	***
Spain	***	***	***
Taiwan	***	***	***
United Kingdom	***	***	***
All other	***	***	***
Subtotal or average	3,459	8,930	2,582
Total castings:			
Austria	***	***	***
Brazil	***	***	***
Canada	***	***	***
France	***	***	***
Japan	***	***	***
Mexico	***	***	***
Portugal	***	***	***
Republic of Korea	***	***	***
Spain	***	***	***
Taiwan	***	***	***
United Kingdom	***	***	***
All other	***	***	***
Total or average	8,908	20,440	2,295

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table D-12.--Bronze ship propellers: U.S. imports, by types and by sources, 1985

Product and source	Quantity	Value	Unit value
	Tons	1,000 dollars	Per ton
Bronze ship propellers:			
Rough castings:			
Brazil	0	-	-
Denmark	0	-	-
Italy	0	-	-
Japan	0	-	-
Mexico	0	-	-
Netherlands	0	-	-
Sweden	0	-	-
Subtotal or average	0	-	-
Advanced castings:			
Brazil	***	***	$***
Denmark	***	***	***
Italy	***	***	***
Japan	***	***	***
Mexico	***	***	***
Netherlands	***	***	***
Sweden	***	***	***
Subtotal or average	362	1,806	4,989
Total:			
Brazil	***	***	***
Denmark	***	***	***
Italy	***	***	***
Japan	***	***	***
Mexico	***	***	***
Netherlands	***	***	***
Sweden	***	***	***
Total or average	362	1,806	4,989

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

APPENDIX E

U.S. PRODUCTION OF SUBJECT IRON PRODUCTS

Table E-1.--Certain iron castings: U.S. production, 1/ by types, 1981-85

(In short tons)

Item	1981	1982	1983	1984	1985
Construction castings:					
Rough castings	105,506	97,588	112,588	133,469	138,788
Advanced castings	56,807	52,787	58,414	67,508	73,783
Total	162,313	150,375	171,002	200,977	212,571
Pipe fittings:					
Rough castings:					
Ductile	***	***	***	***	***
Other	***	***	***	***	***
Subtotal	***	***	***	***	***
Advanced castings:					
Ductile	***	***	***	***	***
Other	***	***	***	***	***
Subtotal	***	***	***	***	***
Total	103,213	97,559	108,892	126,137	122,680
Compressor housings:					
Rough castings	***	***	***	***	***
Advanced castings	***	***	***	***	***
Total	107,447	73,505	89,593	116,141	81,979
Brake drums and rotors:					
Rough castings	***	***	361,666	423,303	400,548
Advanced castings	***	***	177,811	256,609	217,948
Total	487,773	428,559	539,477	679,912	618,496

1/ All firms which reported producing brake drums and rotors provided data on both tonnage and units produced. However, 5 out of 19 firms providing production data on compressor housings were unable to provide data on the number of units produced; the remaining 14 firms, which provided both tonnage and units data, accounted for 93.7 percent of production of compressor housings in 1981, 93.3 percent in 1982, 94.9 percent in 1983, 93.6 percent in 1984, and 92.5 percent in 1985. The number of units of rough and advanced compressor housings and rough and advanced brake drums and rotors reported by producing firms is shown in the following tabulation:

	Compressor housings		Brake drums and rotors	
	Rough	Advanced	Rough	Advanced
1981	15,630,214	***	***	***
1982	11,740,988	***	***	***
1983	10,611,620	***	***	***
1984	12,180,791	***	***	***
1985	8,632,559	***	***	***

Over 92 percent of the reported rough units of brake drums and rotors produced and over 89 percent of the advanced units produced were for the OE market during 1981-85.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Note.--Because of rounding, figures may not add to the totals shown.

APPENDIX F

WEIGHTED-AVERAGE NET U.S. F.O.B. AND DELIVERED SELLING PRICES AND QUANTITIES REPORTED BY U.S. PRODUCERS AND IMPORTERS OF REPRESENTATIVE CAST-IRON PRODUCTS

Table F-1.—Heavy construction castings of iron: Net f.o.b. selling prices and quantities of U.S.-produced 2-piece manhole assemblies, 1/ by types of customers and by quarters, January 1981-December 1985 2/

Period	Sales to distributors			
	Quantity	Weighted average prices	Range of prices	Number of responses
	Number of assemblies	Per assembly	Per assembly	
1981:				
January-March	530	$71.13	$***	4
April-June	445	72.63	***	4
July-September	481	71.01	***	4
October-December	510	71.10	***	4
1982:				
January-March	478	71.34	***	4
April-June	458	72.87	***	4
July-September	430	73.15	***	4
October-December	530	75.50	***	4
1983:				
January-March	562	72.67	***	5
April-June	533	71.45	***	5
July-September	477	69.20	***	4
October-December	482	73.62	***	4
1984:				
January-March	400	71.91	***	4
April-June	420	73.98	***	4
July-September	534	71.34	***	5
October-December	447	71.83	***	4
1985:				
January-March	477	67.22	***	4
April-June	580	75.31	***	5
July-September	451	67.15	***	4
October-December	425	65.91	***	4

See notes at the end of the table.

Table F-1.—Heavy construction castings of iron: Net f.o.b. selling prices and quantities of U.S.-produced 2-piece manhole assemblies, 1/ by types of customers and by quarters, January 1981-December 1985 2/—Continued

Period	Sales to contractors			
	Quantity	Weighted average prices	Range of prices	Number of responses
	Number of assemblies	Per assembly	Per assembly	
1981:				
January-March	***	$***	—	1
April-June	***	***	—	1
July-September	***	***	—	1
October-December	***	***	—	1
1982:				
January-March	***	***	—	1
April-June	***	***	—	1
July-September	***	***	—	1
October-December	***	***	—	1
1983:				
January-March	***	***	$***	2
April-June	***	***	***	2
July-September	***	***	***	2
October-December	***	***	***	2
1984:				
January-March	***	***	***	2
April-June	***	***	***	3
July-September	***	***	***	2
October-December	***	***	***	3
1985:				
January-March	***	***	***	2
April-June	***	***	***	2
July-September	***	***	***	3
October-December	***	***	***	3

1/ 2-piece manhole assembly (cover and frame) of cast-iron, machined, approximately 300 pounds total. Cover approximately 23 inches in diameter; 7/8 to 1-3/8 inches thick. Frame base height approximately 6 inches; clear opening approximately 22 inches; base diameter approximately 32 inches.

2/ The price data were developed from net f.o.b. selling price data reported by U.S. producers of the specified two-piece manhole assembly.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table F-2.--Light construction castings of iron: Net f.o.b. selling prices and quantities of U.S.-produced 2-piece valve boxes sold to distributors, 1/ by quarters, April 1982-December 1985 2/

Period	Quantity	Weighted average prices	Range of prices	Number of responses
	Number of valve boxes	Per valve box	Per valve box	
1982:				
April-June	***	$***	-	1
July-September	***	***	-	1
1983:				
January-March	***	***	-	1
April-June	***	***	$***	3
July-September	***	***	***	2
October-December	***	***	-	1
1984:				
January-March	***	***	-	1
April-June	***	***	-	1
July-September	***	***	***	2
October-December	***	***	-	1
1985:				
January-March	***	***	-	1
April-June	***	***	-	1
July-September	***	***	-	1
October-December	***	***	-	1

1/ 2-piece adjustable cast-iron valve box (bottom section, and top section with lid), screw or sliding type, total weight approximately 60 pounds. Top section 10-1/2 inches in length; cover: drop lid type, 7-1/4 inches approximate diameter, 3-1/4 inches in height; top section and cover weight approximately 35 pounds. Bottom section: shaft inside diameter 5-1/4 inches, outside diameter 5-3/4 inches; base 10-1/4 inches; weight of bottom section approximately 25 pounds.

2/ The price data were developed from net f.o.b. selling price data reported by U.S. producers of the specified cast-iron two-piece valve box.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table F-3.—Heavy construction castings of iron: Net f.o.b. (U.S. locations) selling prices and quantities of imported 2-piece manhole assemblies, 1/ by types of customers, by quarters, January 1981–December 1985 2/

Period	Sales to distributors			
	Quantity	Weighted average prices	Range of prices	Number of responses
	Number of assemblies	Per assembly	Per assembly	
1981:				
January–March	***	$***	$***	2
April–June	***	***	***	2
July–September	***	***	***	2
October–December	***	***	***	2
1982:				
January–March	***	***	***	2
April–June	***	***	***	2
July–September	***	***	***	2
October–December	***	***	***	2
1983:				
January–March	***	***	***	2
April–June	***	***	***	2
July–September	***	***	***	2
October–December	***	***	***	2
1984:				
January–March	***	***	***	3
April–June	***	***	***	3
July–September	***	***	***	3
October–December	***	***	***	3
1985:				
January–March	***	***	***	2
April–June	***	***	***	2
July–September	***	***	***	2
October–December	***	***	***	2

See notes at the end of the table.

Table F-3.—Heavy construction castings of iron: Net f.o.b. (U.S. locations) selling prices and quantities of imported 2-piece manhole assemblies, 1/ by types of customers, by quarters, January 1981-December 1985 2/—Continued

Period	Sales to contractors			
	Quantity	Weighted average prices	Range of prices	Number of responses
	Number of assemblies	Per assembly	Per assembly	
1981:				
January-March	***	$***	$***	2
April-June	***	***	***	2
July-September	***	***	***	2
October-December	***	***	-	1
1982:				
January-March	***	***	***	2
April-June	***	***	-	1
July-September	***	***	***	2
October-December	***	***	-	1
1983:				
January-March	***	***	***	2
April-June	***	***	***	2
July-September	***	***	***	4
October-December	***	***	***	3
1984:				
January-March	***	***	***	3
April-June	***	***	***	3
July-September	***	***	***	3
October-December	***	***	***	3
1985:				
January-March	***	***	***	2
April-June	***	***	***	2
July-September	***	***	***	2
October-December	***	***	***	2

1/ 2-piece manhole assembly (cover and frame) of cast-iron, machined, approximately 300 pounds total. Cover approximately 23 inches in diameter; 7/8 to 1-3/8 inches thick. Frame base height approximately 6 inches; clear opening approximately 22 inches; base diameter approximately 32 inches.

2/ The price data were developed from net f.o.b. (U.S. locations) selling price data reported by U.S. importers of the specified 2-piece manhole assembly.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table F-4.—Light construction castings of iron: Net f.o.b. (U.S. locations) selling prices and quantities of imported 2-piece valve boxes to distributors, 1/ by quarters, April 1982–December 1985 2/

Period	Quantity	Weighted average prices	Range of prices	Number of responses
	Number of valve boxes	Per valve box	Per valve box	
1982:				
April-June	***	$***	$***	3
July-September	***	***	***	2
October-December	***	***	***	3
1983:				
January-March	4,856	14.35	***	4
April-June	***	***	***	3
July-September	6,185	13.67	***	4
October-December	***	***	***	3
1984:				
January-March	4,014	13.02	***	5
April-June	4,838	12.81	***	4
July-September	5,992	12.75	***	4
October-December	1,232	13.03	***	5
1985:				
January-March	1,444	11.98	***	4
April-June	9,896	12.02	***	5
July-September	8,427	11.87	***	4
October-December	5,833	12.47	***	4

1/ 2-piece adjustable cast-iron valve box (bottom section, and top section with lid), screw or sliding type, total weight approximately 60 pounds. Top section 10-1/2 inches in length; cover: drop lid type, 7-1/4 inches approximate diameter, 3-1/4 inches in height; top section and cover weight approximately 35 pounds. Bottom section: shaft inside diameter 5-1/4 inches, outside diameter 5-3/4 inches; base 10-1/4 inches; weight of bottom section approximately 25 pounds.

2/ The price data were developed from net f.o.b. (U.S. locations) selling price data reported by U.S. importers of the specified cast-iron 2-piece valve box.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table F-5.—Construction castings of iron: Net delivered selling prices of domestic and imported 2-piece manhole assemblies, 1/ by types of customers and by quarters, January 1981-December 1985 2/

Period	Sales to distributors		Sales to contractors	
	U.S.-produced	Imported	U.S.-produced	Imported
	Per assembly			
1981:				
January-March	$***	$***	$***	$***
April-June	***	***	***	***
July-September	***	***	***	***
October-December	***	***	***	***
1982:				
January-March	***	***	***	***
April-June	***	***	***	***
July-September	***	***	***	***
October-December	***	***	***	***
1983:				
January-March	***	***	***	***
April-June	***	***	***	***
July-September	***	***	***	***
October-December	***	***	***	***
1984:				
January-March	***	***	***	***
April-June	***	***	***	***
July-September	***	***	***	***
October-December	***	***	***	***
1985:				
January-March	***	***	***	***
April-June	***	***	***	***
July-September	***	***	***	***
October-December	***	***	***	***

1/ 2-piece manhole assembly (cover and frame) of cast-iron, machined, approximately 300 pounds total. Cover approximately 23 inches in diameter; 7/8 to 1-3/8 inches thick. Frame base height approximately 6 inches; clear opening approximately 22 inches; base diameter approximately 32 inches.

2/ The delivered price data were calculated from U.S. inland shipping costs and f.o.b. (U.S. locations) prices reported by U.S. producers and importers for delivery of the largest sales to their largest customers.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table F-6.--Light construction castings of iron: Net delivered selling prices of U.S.-produced and imported 2-piece valve boxes sold to distributors, 1/ by quarters, April 1982-December 1985 2/

Period	U.S.-produced	Imported
	Per valve box	
1982:		
April-June	$***	$***
July-September	***	***
October-December	-	***
1983:		
January-March	***	***
April-June	***	***
July-September	***	***
October-December	***	***
1984:		
January-March	***	***
April-June	***	***
July-September	***	***
October-December	***	***
1985:		
January-March	***	***
April-June	***	***
July-September	***	***
October-December	***	***

1/ 2-piece adjustable cast-iron valve box (bottom section, and top section with lid), screw or sliding type, total weight approximately 60 pounds. Top section 10-1/2 inches in length; cover: drop lid type, 7-1/4 inches approximate diameter, 3-1/4 inches in height; top section and cover weight approximately 35 pounds. Bottom section: shaft inside diameter 5-1/4 inches, outside diameter 5-3/4 inches; base 10-1/4 inches; weight of bottom section approximately 25 pounds.

2/ The delivered price data were calculated from U.S. inland shipping costs and f.o.b. (U.S. locations) prices reported by U.S. producers and importers for delivery of the largest sales to their largest customers.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table F-7.—Cast-iron pipe fittings: Net f.o.b. selling prices and quantities of U.S.-produced pipe fittings 8 inches in diameter with a 45° bend, 1/ by types of customers and by quarters, January 1981-December 1985 2/

Period	Sales to distributors: Quantity	Weighted average prices	Range of prices	Number of responses
	Number of fittings	Per fitting	Per fitting	
1981:				
January-March	***	$***	$***	3
April-June	***	***	***	3
July-September	***	***	***	3
October-December	***	***	***	3
1982:				
January-March	2,530	67.96	***	4
April-June	2,516	68.00	***	4
July-September	2,538	67.98	***	4
October-December	2,531	67.99	***	4
1983:				
January-March	3,070	67.56	***	5
April-June	3,086	67.53	***	5
July-September	3,091	67.58	***	5
October-December	3,070	67.63	***	5
1984:				
January-March	3,137	67.38	***	5
April-June	3,107	67.36	***	5
July-September	3,087	67.36	***	5
October-December	3,092	68.26	***	5
1985:				
January-March	2,670	67.87	***	5
April-June	2,682	67.85	***	5
July-September	2,680	67.87	***	5
October-December	2,692	67.93	***	5

See notes at the end of the table.

Table F-7.—Cast-iron pipe fittings: Net f.o.b. selling prices and quantities of U.S.-produced pipe fittings 8 inch in diameter with a 45° bend, 1/ by types of customers, by quarters, January 1981–December 1985 2/—Continued

Period	Sales to contractors			
	Quantity	Weighted average prices	Range of prices	Number of responses
	Number of fittings	Per fitting	Per fitting	
1981:				
January-March	***	$***	–	1
April-June	***	***	–	1
July-September	***	***	–	1
October-December	***	***	–	1
1982:				
January-March	***	***	$***	2
April-June	***	***	***	2
July-September	***	***	***	2
October-December	***	***	–	1
1983:				
January-March	***	***	***	2
April-June	***	***	***	2
July-September	***	***	***	2
October-December	***	***	***	2
1984:				
January-March	***	***	***	2
April-June	***	***	***	3
July-September	***	***	***	2
October-December	***	***	–	1
1985:				
January-March	***	***	–	1
April-June	***	***	***	3
July-September	***	***	***	3
October-December	***	***	***	2

1/ Cast-iron pipe fitting 8 inches in diameter, 45° bend, mechanical joint, gray iron, class 250 (water working pressure), with complete accessories, total weight approximately 160 pounds.

2/ The price data were developed from net f.o.b. selling price data reported by U.S. producers of the specified cast-iron pipe fitting product.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table F-8.—Cast-iron pipe fittings: Net f.o.b. (U.S. locations) selling prices and quantities of imported pipe fittings 8 inches in diameter with a 45° bend, 1/ sold to distributors, by quarters, January 1981–December 1985 2/

Period	Quantity	Weighted average prices 3/	Number of responses
	Number of fittings	Per fitting	
1981:			
January-March	***	$***	1
April-June	***	***	1
July-September	***	***	1
October-December	***	***	1
1982:			
January-March	***	***	1
April-June	***	***	1
July-September	***	***	1
October-December	***	***	1
1983:			
January-March	***	***	1
April-June	***	***	1
July-September	***	***	1
October-December	***	***	1
1984:			
January-March	***	***	1
April-June	***	***	1
July-September	***	***	1
October-December	***	***	1
1985:			
January-March	***	***	1
April-June	***	***	1
July-September	***	***	1
October-December	***	***	1

1/ Cast-iron pipe fitting 8 inches in diameter, 45° bend, mechanical joint, gray iron, class 250 (water working pressure), with complete accessories, total weight approximately 160 pounds.

2/ The price data were developed from net f.o.b. (U.S. locations) selling price data reported by a single U.S. importer of the specified pipe fitting product, * * *.

3/ The price data reported did not include the value of accessories, because the responding importer does not sell his pipe fittings with accessories.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table F-9.—Cast-iron pipe fittings: Net delivered selling prices of U.S.-produced and imported pipe fittings sold to distributors, 1/ by quarters, January 1981-December 1985 2/

Period	U.S.-produced	Imported 3/
	Per fitting	
1981:		
January-March	$***	$***
April-June	***	***
July-September	***	***
October-December	***	***
1982:		
January-March	***	***
April-June	***	***
July-September	***	***
October-December	***	***
1983:		
January-March	***	***
April-June	***	***
July-September	***	***
October-December	***	***
1984:		
January-March	***	***
April-June	***	***
July-September	***	***
October-December	***	***
1985:		
January-March	***	***
April-June	***	***
July-September	***	***
October-December	***	***

1/ Cast-iron pipe fitting 8 inches in diameter, 45° bend, mechanical joint, gray iron, class 250 (water working pressure), with complete accessories, total weight approximately 160 pounds.

2/ The delivered price data were calculated from U.S. inland shipping costs and f.o.b. (U.S. locations) prices reported by U.S. producers and a single importer for delivery of the largest sales to their largest customers.

3/ The delivered prices reported by * * *.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table F-10.—Cast-iron compressor housings: Net f.o.b. selling prices and quantities of U.S.-produced compressor housings for 1-horsepower motors, by quarters, January 1981–December 1985 1/

Period	3-lb. compressor housing 2/		5.3-lb. compressor housing 3/		6.6-lb. compressor housing 4/	
	Quantity	Price	Quantity	Price	Quantity	Price
	No. of housings	Per housing	No. of housings	Per housing	No. of housings	Per housing
1981:						
Jan.-Mar	***	$***	***	$***	–	–
Apr.-June	***	***	***	***	–	–
July-Sept	***	***	***	***	–	–
Oct.-Dec	***	***	***	***	–	–
1982:						
Jan.-Mar	***	***	***	***	–	–
Apr.-June	***	***	***	***	–	–
July-Sept	***	***	***	***	–	–
Oct.-Dec	***	***	***	***	–	–
1983:						
Jan.-Mar	***	***	***	***	–	–
Apr.-June	***	***	***	***	–	–
July-Sept	***	***	***	***	–	–
Oct.-Dec	***	***	***	***	–	–
1984:						
Jan.-Mar	***	***	***	***	–	–
Apr.-June	***	***	***	***	–	–
July-Sept	–	–	***	***	***	$***
Oct.-Dec	***	***	***	***	***	***
1985:						
Jan.-Mar	***	***	***	***	***	***
Apr.-June	***	***	***	***	***	***
July-Sept	***	***	***	***	***	***
Oct.-Dec	–	–	***	***	***	***

See notes at the end of the table.

Table F-10.—Cast-iron compressor housings: Net f.o.b. selling prices and quantities of U.S.-produced compressor housings for 1-horsepower motors, by quarters, January 1981-December 1985 1/—Continued

Period	8.5-lb. compressor housing 5/		15-lb. compressor housing 6/		19-lb. compressor housing 7/	
	Quantity	Price	Quantity	Price	Quantity	Price
	No. of housings	Per housing	No. of housings	Per housing	No. of housings	Per housing
1981:						
Jan.-Mar	***	$***	-	-	-	-
Apr.-June	***	***	***	$***	-	-
July-Sept	***	***	***	***	-	-
Oct.-Dec	***	***	***	***	-	-
1982:						
Jan.-Mar	***	***	***	***	-	-
Apr.-June	***	***	***	***	-	-
July-Sept	***	***	***	***	-	-
Oct.-Dec	-	-	-	-	***	$***
1983:						
Jan.-Mar	-	-	***	***	***	***
Apr.-June	***	***	***	***	***	***
July-Sept	***	***	***	***	***	***
Oct.-Dec	***	***	***	***	***	***
1984:						
Jan.-Mar	***	***	***	***	***	***
Apr.-June	***	***	***	***	***	***
July-Sept	***	***	***	***	***	***
Oct.-Dec	-	-	***	***	***	***
1985:						
Jan.-Mar	-	-	***	***	***	***
Apr.-June	-	-	***	***	***	***
July-Sept	-	-	***	***	***	***
Oct.-Dec	-	-	***	***	***	***

1/ The price data were developed from net f.o.b. selling price data reported by U.S. producers of cast-iron compressor housings for 1 horsepower hermetic-type motor compressors, not for use in automotive air-conditioning and using a refrigerant other than ammonia.
2/ Reported by * * *.
3/ Reported by * * *.
4/ Reported by * * *.
5/ Reported by * * *.
6/ Reported by * * *.
7/ Reported by * * *.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table F-11.--Cast-iron compressor housings: Net f.o.b. selling prices and quantities of U.S.-produced compressor housings for 40-ton compressors, by quarters, January 1981-December 1985 1/

Period	165-lb. compressor housing 2/		200-lb. compressor housing 3/		1,400-lb. compressor housing 4/	
	Quantity	Price	Quantity	Price	Quantity	Price
	No. of housings	Per housing	No. of housings	Per housing	No. of housings	Per housing
1981:						
Jan.-Mar	-	-	***	$***	***	$***
Apr.-June	-	-	-	-	***	***
July-Sept	-	-	-	-	***	***
Oct.-Dec	-	-	-	-	***	***
1982:						
Jan.-Mar	-	-	***	***	***	***
Apr.-June	-	-	***	***	***	***
July-Sept	-	-	***	***	***	***
Oct.-Dec	-	-	***	***	***	***
1983:						
Jan.-Mar	-	-	***	***	***	***
Apr.-June	-	-	***	***	***	***
July-Sept	-	-	***	***	***	***
Oct.-Dec	***	$***	***	***	***	***
1984:						
Jan.-Mar	***	***	***	***	***	***
Apr.-June	***	***	-	-	***	***
July-Sept	***	***	***	***	***	***
Oct.-Dec	***	***	***	***	***	***
1985:						
Jan.-Mar	-	-	***	***	***	***
Apr.-June	-	-	***	***	***	***
July-Sept	-	-	***	***	-	***
Oct.-Dec	-	-	***	***	-	***

1/ The price data were developed from net f.o.b. selling price data reported by U.S. producers of cast-iron compressor housings for 40-ton reciprocating compressors.

2/ Reported by * * *.

3/ Reported by * * *.

4/ Reported by * * *.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table F-12.—Cast-iron compressor housings: Net f.o.b. (U.S. locations) selling prices and quantities of imported 5.5-pound compressor housings for 1-horsepower motors, by quarters, April 1983-December 1985 1/

Period	Quantity	Price
	Number of compressor housings	Per compressor housing
1983:		
April-June	***	$***
July-September	-	-
October-December	***	***
1984:		
January-March	***	***
April-June	***	***
July-September	***	***
October-December	***	***
1985:		
January-March	***	***
April-June	***	***
July-September	***	***
October-December	***	***

1/ The price data were developed from net c.i.f. duty-paid landed costs at the U.S. port of entry reported by * * *.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table F-13.—Cast-iron compressor housings: Net delivered selling prices of U.S-produced and imported compressor housings for 1 horsepower motors, 1/ by quarters, April 1983-December 1985 2/

Period	U.S.-produced	Imported
	Per compressor housing	
1983:		
April-June	$***	$***
July-September	***	-
October-December	***	***
1984:		
January-March	***	***
April-June	***	***
July-September	***	***
October-December	***	***
1985:		
January-March	***	***
April-June	***	***
July-September	***	***
October-December	***	***

1/ The reported prices were for a compressor housing for a 1-horsepower hermetic-type motor, not for use in automotive air conditioning and using a refrigerant other than ammonia. The domestic compressor housing was approximately 5.3 pounds and the imported product was approximately 5.5 pounds.
2/ The delivered price data were calculated from U.S. inland shipping costs and f.o.b. (U.S. locations) prices reported by a single U.S. producer, * * *, and a single U.S. importer, * * *.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table F-14.—Cast-iron brake drums and rotors: Net f.o.b. selling prices and quantities of U.S.-produced 9-inch brake drums, 1/ by markets served and by quarters, January 1981-December 1985 2/

Period	Sales to the OE market 3/			
	Quantity	Weighted average prices	Range of prices	Number of responses
	Number of brake drums	Per brake drum	Per brake drum	
1981:				
January-March	***	$***	$***	3
April-June	95,691	3.84	***	4
July-September	239,609	4.24	***	4
October-December	309,450	4.16	***	4
1982:				
January-March	391,580	4.19	***	4
April-June	315,576	4.28	***	4
July-September	293,196	4.19	***	4
October-December	201,402	4.00	***	4
1983:				
January-March	448,034	4.22	***	4
April-June	659,779	4.14	***	4
July-September	509,846	4.06	***	4
October-December	490,932	4.03	***	4
1984:				
January-March	495,358	4.06	***	4
April-June	488,990	4.01	***	4
July-September	398,596	4.02	***	4
October-December	***	***	***	3
1985:				
January-March	568,973	4.05	***	4
April-June	550,189	3.96	***	4
July-September	508,320	4.25	***	4
October-December	***	***	***	3

See notes at the end of the table.

Table F-14.--Cast-iron brake drums and rotors: Net f.o.b. selling prices and quantities of U.S.-produced 9-inch brake drums, 1/ by markets served and by quarters, January 1981-December 1985 2/--Continued

Period	Sales to the aftermarket (replacement market): Quantity	Weighted average prices	Number of responses
	Number of brake drums	Per brake drum	
1981:			
January-March	***	$***	1
April-June	***	***	1
July-September	***	***	1
October-December	***	***	1
1982:			
January-March	***	***	1
April-June	***	***	1
July-September	***	***	1
October-December	***	***	1
1983:			
January-March	***	***	1
April-June	***	***	1
July-September	***	***	1
October-December	***	***	1
1984:			
January-March	***	***	1
April-June	***	***	1
July-September	***	***	1
October-December	***	***	1
1985:			
January-March	***	***	1
April-June	***	***	1
July-September	***	***	1
October-December	***	***	1

1/ Cast-iron 9-inch brake drum casting, gray iron, steel back plate, for intermediate-size automobiles, total weight approximately 12-16 pounds for OE sales and about 19 pounds for aftermarket sales.

2/ The price data were developed from net f.o.b. selling price data reported by a single U.S. producer of the specified cast-iron brake drum, * * *.

3/ Original equipment market.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table F-15.—Cast-iron brake drums and rotors: Net f.o.b. (U.S. locations) selling prices and quantities of imported 9-inch brake drums, 1/ sold to the aftermarket, by quarters, January 1981-December 1985 2/

Period	Quantity	Weighted average prices	Number of responses
	Number of brake drums	Per brake drum	
1981:			
January-March	***	$***	1
April-June	***	***	1
July-September	***	***	1
October-December	***	***	1
1982:			
January-March	***	***	1
April-June	***	***	1
July-September	***	***	1
October-December	***	***	1
1983:			
January-March	***	***	1
April-June	***	***	1
July-September	***	***	1
October-December	***	***	1
1984:			
January-March	***	***	1
April-June	***	***	1
July-September	***	***	1
October-December	***	***	1
1985:			
January-March	***	***	1
April-June	***	***	1
July-September	***	***	1
October-December	***	***	1

1/ Cast-iron 9-inch brake drum casting, gray iron, steel back plate, for intermediate-size automobiles, total weight approximately 13 pounds.

2/ The price data were developed from net f.o.b. (U.S. locations) selling price data reported by a single U.S. importer of the specified cast-iron brake drum, * * *. If the imported brake drum was machined or otherwise processed by the importer before being sold or used as a brake drum or as part of a brake assembly, the reporting firm was requested to report his c.i.f. duty-paid, landed costs of the item.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table F-16.--Cast-iron brake drums and rotors: Net delivered selling prices of U.S.-produced and imported 9-inch brake drums, 1/ sold to the aftermarket, by quarters, January 1981-December 1985 2/

Period	U.S.-produced	Imported
	Per pound 3/	
1981:		
January-March	$***	$***
April-June	***	***
July-September	***	***
October-December	***	***
1982:		
January-March	***	***
April-June	***	***
July-September	***	***
October-December	***	***
1983:		
January-March	***	***
April-June	***	***
July-September	***	***
October-December	***	***
1984:		
January-March	***	***
April-June	***	***
July-September	***	***
October-December	***	***
1985:		
January-March	***	***
April-June	***	***
July-September	***	***
October-December	***	***

1/ Cast-iron 9-inch brake drum casting, gray iron, steel back plate, for intermediate-size automobiles, total weight per drum about 19 pounds for the domestic product and about 13 pounds for the imported product.

2/ The delivered price data were calculated from U.S. inland shipping costs and f.o.b. (U.S. locations) prices reported by U.S. producers and importers for delivery of the largest sales to their largest customers.

3/ Delivered price comparisons between the domestic and imported 9-inch brake drum were made on a cents-per-pound basis because of the significantly different weights of the reported brake drums, about 19 pounds per drum for the domestic product and 13 pounds per drum for the imported product.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.