Logistics Management Institute

An Assessment of the

Economic Status of the Antifriction Bearing Industry

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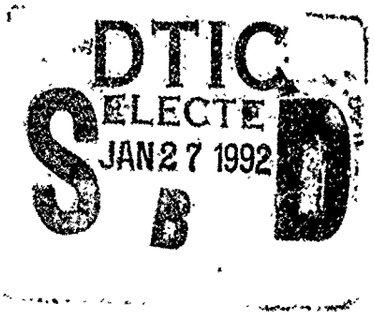

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Military equipment with moving parts requires antifriction bearings. Superprecision bearings, which are manufactured with closer tolerances under more stringent conditions, are often needed to meet high-performance characteristics such as silencing in submarines. A steady increase in imports of antifriction bearings coupled with reduced prices and profitability in the domestic industry led domestic manufacturers to seek legislative and regulatory relief from foreign competition.

Since 1987, the Government has provided two types of relief to the industry. First, after a Department of Commerce investigation established that foreign producers were selling products in the U.S. market at prices below those they charged in their home markets, the Government imposed antidumping duties on several types of bearings from 12 countries. Second, DoD restricted the purchase of antifriction bearings for use in defense end items to those of domestic manufacture. Although that restriction is due to expire on 30 September 1991, DoD may renew it for an additional 2 years "if conditions warrant." This study assesses the current economic health of the U.S. antifriction bearing industry, analyzes the relative impact of the two forms of relief provided to the industry, and discusses the advantages and disadvantages of DoD's policy options.

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Executive Summary

AN ASSESSMENT OF THE ECONOMIC STATUS OF THE ANTIFRICTION BEARING INDUSTRY

Military equipment with moving parts requires antifriction bearings. Superprecision bearings, which are manufactured with closer tolerances under more stringent conditions, are often needed to meet high-performance characteristics such as silencing in submarines. A steady increase in imports of antifriction bearings coupled with reduced prices and profitability in the domestic industry led domestic manufacturers to seek legislative and regulatory relief from foreign competition.

Since 1987, the Government has provided two types of relief to the industry. First, after a Department of Commerce investigation established that foreign producers were selling products in the U.S. market at prices below those they charged in their home markets, the Government imposed antidumping duties on several types of bearings from 12 countries. Second, DoD restricted the purchase of antifriction bearings for use in defense end items to those of domestic manufacture. Although that restriction is due to expire on 30 September 1991, DoD may renew it for an additional 2 years "if conditions warrant." Our study assesses the current status of the U.S. antifriction bearing industry, analyzes the relative impact of the two forms of relief provided to the industry, and discusses the advantages and disadvantages of policy options.

Economically, the bearing industry reached its nadir 1986–1987; it faced increasing imports, declining exports, lower prices, and reduced profitability. Since then, shipments, exports, profitability, and capital investment have significantly increased. Import penetration leveled off at 20 percent, while domestic shipments increased 4 percent a year from 1988 through 1990 with the increase in domestic production going to meet the increased demand for exports. We found that neither business cycles nor variations in the foreign exchange value of the dollar account for the recently improved profitability in the bearing industry. Consequently, we conclude that the relief measures are responsible. Antidumping duties are high – averaging 35 to 40 percent – and affect about 70 percent of bearing imports. The

DoD restriction affects 5 to 15 percent of total DoD demand and has resulted in somewhat higher prices for DoD. A comparative analysis of the antidumping duties and the DoD restriction shows that the duties provided substantially more benefit to domestic producers than the DoD restriction.

Continuation of the restriction would impose increased costs on DoD and, compared to the antidumping duties, would provide a relatively minor benefit to the industry. Yet opening the DoD market, particularly the superprecisi[illegible]egment, to foreign competition could encourage dumping in that market. The advantage of discontinuing the restriction is that DoD would have access to a wider range of lower cost sources. Extending the antidumping duties to DoD purchases would provide domestic producers protection from foreign competition and would make the defense market comparable to the commercial market. However, legislation passed in 1988 precludes DoD from imposing antidumping duties on defense purchases from any country with whom we have a memorandum of understanding. A final alternative is for DoD to extend the restriction only for the superprecision segment, the one most critical for defense. DoD would pay somewhat higher prices for superprecision bearings, but dumping would be precluded in that critical segment.

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CHAPTER 1

AN OVERVIEW OF THE ANTIFRICTION BEARING INDUSTRY

THE PROBLEM

Antifriction bearings are contained in most items with moving parts, and military equipment is no exception often containing thousands of bearings of different sizes and types. Superprecision bearings are a special category of antifriction bearings that are manufactured with tighter tolerances, use higher quality materials, and are produced under more rigorous conditions. High-performance aircraft require superprecision bearings and submarines use them for silencing. According to the Joint Logistics Commanders' (JLC's) study of the bearing industry, defense items account for 50 to 70 percent of the dollar value of superprecision bearings used in the United States.[1] DoD has determined that antifriction bearings are critical to national defense and seeks a dependable supply of bearings to meet its needs under all contingencies.

The United States experienced a severe recession during 1981–1982. While most industries eventually recovered, the bearing industry never returned to previous levels of production and profitability existing prior to the recession. Because of steady increases in import penetration and reduced profitability, the industry sought legislative and regulatory relief from foreign competition. It received relief in the form of antidumping duties as a result of an investigation by the Department of Commerce (DoC) and the International Trade Commission (ITC), and a DoD restriction on the purchase of bearings from foreign manufacturers. The DoD restriction expires on 30 September 1991, and DoD must decide whether to extend the restriction for the additional 2 years allowed in the regulation. In this study, we provide an assessment of the health of the antifriction bearing industry before and after relief and an analysis of the relative impact of the antidumping duties and the

[1] *Joint Logistics Commanders Bearing Study*, Joint Bearing Working Group of the Joint Group on the Industrial Base, June 1988.

DoD restriction. We also provide a discussion of policy options to assure the supply of bearings for defense.

ECONOMIC TRENDS IN THE ANTIFRICTION BEARING INDUSTRY

The antifriction bearing industry experienced a decline in economic health between 1980 and 1987. The industry was characterized by small increases in the value of domestic shipments, increasing imports, and declining exports. Import penetration[2] rose from 14 percent in 1980 to 18 percent in 1987. After the 1981–1982 recession, industry profitability continued to run about 2 to 3 percentage points below industry returns prior to the recession. Constant-dollar capital expenditures declined at an average annual rate of 10 percent, a further indication of an industry experiencing difficulty.

The industry seemed to improve after hitting a low point around 1986 or 1987. Domestic shipments began to increase and exports doubled from 1987 to 1990. While imports continued to increase in 1988 and 1989, they decreased in 1990 and import penetration leveled off at 20 to 21 percent for those years. Even though reliable up-to-date profitability data are scarce, they indicate improved profitability. Furthermore, an industry survey conducted for this study indicates that capital investment also increased.

FACTORS AFFECTING THE INDUSTRY

Four factors affected the economic status of the antifriction bearing industry. Two of those factors affected the entire U.S. economy, and the others affected only the bearing industry. First, the United States' economy experienced two recessions in the early 1980s: a mild one in 1980 and a more severe one from 1981 through 1982. Second, because the foreign exchange value of the dollar rose steadily between 1980 and 1985, domestic manufacturers had difficulty competing in foreign markets, and against imported products in domestic markets. By 1987, the foreign exchange value of the dollar had returned to 1980 levels, and the U.S. trade balance began to improve.

Two additional factors affect the antifriction bearing industry but not necessarily the whole economy. The bearing industry is one of many that benefited

[2]Import penetration is imports provided by apparent consumption, which is defined as domestic shipments + imports – exports + changes in inventories.

from the defense buildup that occurred in the early 1980s. Between 1981 and 1983, the total dollar value of defense contract awards for supplies and equipment increased 15 to 20 percent each year. Finally, the bearing industry received two types of relief from foreign competition in the late 1980s. The first form of relief is the imposition of antidumping duties on several types of bearings from a number of major sources of imports. While the legal definition and the process required to establish dumping is highly complicated, a simple definition of dumping is selling large quantities of goods at below-market prices to eliminate competition and gain market share. Low-priced imports do not necessarily mean that dumping is occurring; U.S. statutes require that those prices must harm or threaten to harm domestic industry. The second form of relief is a DoD restriction prohibiting the purchase of bearings from foreign manufacturers for use in defense items.

EFFECT OF FACTORS ON THE INDUSTRY

Several pieces of evidence indicate that the status of the industry began to improve in 1987 or 1988. To determine which factor is responsible for the improvement, we analyzed the impact of business cycles, the foreign exchange value of the dollar, and the relief measures. Since DoD contract awards were declining by 1986, we excluded the defense buildup as an explanation for the recent improvement in profitability. To examine the role of the business cycle of recession and recovery, we looked at business activity in industries that are major users of bearings. The automobile industry and the industrial machinery industry together use 55 percent of the bearings consumed in the United States. As expected, shipments of antifriction bearings follow trends in shipments for the major users very closely. However, based on our statistical analysis, we found that increased profitability in the bearing industry is not related to increases in shipments by the major users.

The second factor, the foreign exchange value of the dollar, should have an inverse relationship to industry profitability. As the value of the dollar rises, domestic products become more costly by comparison with foreign products, both in foreign markets and in domestic markets. Results on the foreign exchange value of the dollar are mixed. After-tax returns show that the profitability of the bearing industry had no relationship to the exchange rate, but before-tax returns show the expected negative relationship. Even so, that relationship does not explain the

improvement in profitability for the past 3 years during a time when the exchange value of the dollar has remained steady.

Thus, by process of elimination, we conclude that the relief measures had a beneficial effect on the antifriction bearing industry. In Chapter 5, we analyzed the relative impact of the antidumping duties and the DoD restriction to determine which relief measure was most influential. We measured benefits as the net increase in revenues for domestic manufacturers. Our analysis showed that the antidumping duties provided substantially more financial benefit than did the DoD restriction.

POLICY OPTIONS FOR DoD

We believe that DoD has five policy options for its restriction on imported antifriction bearings:

- Renew the existing restriction for an additional 2 years
- Allow the restriction to expire
- Extend the antidumping duties to defense purchases
- Modify the restriction to include an evaluation factor, either on price or content
- Renew the restriction, but include only those types of bearings that are critical for national security.

Antidumping duties on 70 percent of the bearing imports in the commercial market and a concomitant restriction in the defense market creates the potential for separate and unequal markets. The results of recent antidumping investigations of the bearing industry show that many exporters are able to offer products at prices below those needed by domestic companies to remain profitable. The antidumping duties protect domestic manufacturers in the commercial market by raising import prices. Currently, the DoD restriction protects manufacturers in the defense market by excluding foreign competition, but if that restriction were to be removed it would give some foreign sources the opportunity to dump in the defense market. DoD has negotiated memorandums of understanding (MOUs) with a number of countries. The signatories to the MOUs have promised to provide open access to each others defense markets, including duty-free entry for military items. Normally, such an MOU would allow foreign sources to compete in our defense market on the same basis that they would compete in our commercial market. However, legislation precludes the

imposition of antidumping duties on military items from countries with whom we have an MOU. Therefore, if the DoD restriction on imported bearings was removed, countries with an MOU would compete in the defense market on a different basis than they do in the commercial market.

Thus, the major advantage of renewing the current restriction is to prevent countries with MOUs from dumping in the defense market. The disadvantages are that DoD pays higher prices for antifriction bearings and pays administrative costs to implement the restriction. The restriction also removes qualified foreign sources from competition. The advantages and disadvantages of allowing the restriction to expire are the exact reverse of those for renewing it. DoD will avoid administrative costs of implementation and higher product prices but must accept the possibility of dumping.

Extending the antidumping duties to DoD purchases has several advantages. It provides the same access to the defense market that foreign manufacturers have to our commercial market. The duties are self-correcting in that they decrease or disappear as the foreign suppliers cease dumping. DoD would pay higher prices but would save the administrative costs of implementing a restriction. However, this option is currently precluded by 19 U.S. Code (U.S.C.) 1677(20)(B), which exempts MOU signatories from paying any antidumping duties assessed if the product will be used in a defense end item.

Adding an evaluation factor to the current restriction would provide limited protection for manufacturers selling in the defense market. The main disadvantage is that it requires extensive and unwieldy implementation procedures. The final option is to restrict purchases of superprecision bearings only. While superprecision bearings are a small part of the domestic market, DoD purchases 50 to 70 percent of the dollar value of that production. This option provides protection for a critical segment of the industry and encourages competition for commodity bearings.

CHAPTER 2

DoD DEMAND FOR ANTIFRICTION BEARINGS

BEARING CHARACTERISTICS AND USES

Bearings reduce friction between moving parts. They are classified by type of rolling element – ball or roller – and their size, configuration, and degree of precision. The difference between ball and roller elements is in the speed of their application and the load they can handle. Ball bearings are used in high-speed applications but are limited in the amount of load that they can carry. A roller bearing, on the other hand, can carry a larger load because it provides more linear contact with the rolling surface, but it is limited to lower speed applications because that additional contact increases friction.

Bearings are produced in a number of configurations depending on the load and how the bearing assembly bears the load. Radial bearings are designed to support loads perpendicular to the shaft axis, and thrust bearings support loads parallel to it. A bearing may have a double row of rolling elements or the rolling element may make contact at an angle so that the bearing can support both radial and thrust loads.

Many types of bearings have special configurations:

- Bearings with integral shafts save space and are found in computer disk drives and spindles.
- Angular contact bearings, where the balls contact the raceway at an angle, are found in machine tools, wheel bearings, and propellers.
- Spherical roller bearings have a rolling element shaped like a barrel, can withstand substantial thrust and radial loads, and are used in heavy equipment such as construction machinery, dredges, printing presses, and textile machinery.
- Needle bearings, which have a higher ratio of length to diameter for the rolling element than roller bearings and may not have an inner ring so that the element has direct contact with the shaft, are used in slow-speed applications where space is at a premium. The most common uses for needle

bearings are truck and automobile transmissions, construction machinery, and off-road equipment.

Antifriction bearings are sized by the outer diameter of the bearing assembly, which consists of an inner ring, the rolling elements, and an outer ring. Bearings up to 9 mm outer diameter (O.D.) are called miniature bearings, and bearings between 9 mm O.D. and 30 mm O.D. are called instrument bearings. Miniature and instrument bearings are used in guidance, telemetric, and control instruments, as well as computer disk drives, bombsights, fire-control mechanisms, and machine tools. Bearings with outer diameters between 30 mm and 100 mm are used in turbine engines and gear boxes and thus in most military aircraft; they are also found in ship pumps, compressors, and motors. Bearings with outer diameters over 100 mm are used for heavy applications such as nuclear reactors, electrical generators, marine propeller shafts, tanks, heavy ordnance, and cargo aircraft landing gear. Some of the largest bearings have outer diameters of 30 feet.

All bearings are precision parts, but the "superprecision" categories require even closer tolerances. While most superprecision bearings are concentrated in the smaller sizes, larger bearings can also be manufactured to superprecision standards. The Antifriction Bearing Manufacturer's Association (AFBMA) sponsors the industry standards for precision, which are approved by the American National Standards Institute (ANSI). The U.S. standards are equivalent to the international standards published by the International Organization for Standardization (ISO). The Annular Bearing Engineers Committee (ABEC) of AFBMA establishes the standards. Precision runs from ABEC 1 for ball bearings and RBEC 1 for roller bearings to ABEC/RBEC 9, the highest level of precision. Bearings with ABEC/RBEC ratings of 5 or above are considered superprecision bearings. The precision standards apply to radial bearings only; precision tolerances for thrust bearings have not been standardized.

DoD ANTIFRICTION BEARING REQUIREMENTS

Military end items use a large number of different type and size bearings. The JLC study on the bearing industry reports that the KC-10 refueling aircraft uses 6,000 bearings and the C-17 is expected to use 10,000 bearings.[1] The average helicopter has 2,500 bearings in the transmission, gear boxes, and rotor linkages.

[1]Op. cit.

Since bearings are not end items but are usually components of end items, DoD does not purchase large quantities of antifriction bearings directly. Most DoD demand for bearings is indirect, generated by the purchase of end items containing bearings. No data are available to provide an accurate measure of indirect demand, and as a result, bearing industry studies have used various techniques to estimate indirect demand. The JLC study estimated total DoD demand on average was 17 percent of the domestic market between 1983 and 1987. That estimate was built up in four steps. The DoC input/output model was used to estimate direct DoD purchases of bearings. The Defense Economic Impact Modeling System (DEIMS) model was used to develop an estimate of indirect demand (defined as the bearings contained in purchased components and end items). The authors of the JLC study then projected direct demand to be roughly half of the indirect demand to make it compatible with the initial results of the input/output model. The third step was to add induced demand, which was defined as the bearings in the equipment used to produce defense items. The DoC input/output model, along with economy-wide capital investment trends, produced an estimate of the induced demand. Since foreign military sales (FMS) have accounted for about 8 percent of total defense spending for bearings, that figure was used for the fourth step, FMS demand. The resulting estimates in the JLC study show the sum of the indirect, induced, and FMS demand as a constant multiple at three times the direct demand

The JLC authors also provide some actual industry data that they collected from 11 bearing manufacturers during the study. The manufacturers were asked for data on defense shipments between 1981 and 1985. Since they were asked to include bearings purchased by other manufacturers that would end up in defense equipment, their data include some indirect demand. The 11 manufacturers accounted for half of industry shipments and reported their defense shipments to be 13 percent to 16 percent of total shipments.

The DEIMS estimates total DoD demand to be between 11 percent and 13 percent of industry shipments for 1986 through 1989. The DEIMS estimates are developed using an input/output model and DoD budget figures. The DoC Section 232 study on the national security implications of the status of the bearing industry

provided only a total estimate of defense demand, which is 19 percent of U.S. consumption.[2]

Table 2-1 shows DoD direct purchases of antifriction bearings and an estimate of the resulting indirect demand for 1980 through 1990. The direct purchase data are annual totals of contract actions for Federal Supply Class (FSC) 3110, "Bearings, Antifriction, Unmounted." Our estimates of indirect demand were calculated by using a factor to express the relationship between direct and indirect demand. The factor is a compromise between the factors from the JLC study and the factors from DEIMS to correct for the fact that neither of those sources use actual direct demand. The various sources tended to converge on estimates of total DoD demand as being 15 to 20 percent of U.S. consumption during the mid-1980s. We assumed that our estimates should be in that range also. The JLC study started with direct demand at 2 to 3 times the actual direct purchases so their factors were judged to underestimate indirect demand. The DEIMS study shows direct demand at one-third to one-half of actual direct purchases so its factors overestimate indirect demand when actual direct purchases are used.

Our estimates show DoD's direct purchases of bearings peaked in 1985, the same year the DoD procurement budget peaked. Since then, direct purchases of bearings have declined at a rate of 11 percent a year. Since direct purchases tend to follow DoD procurement levels, we expect DoD's direct bearing purchases to continue to decline as the defense budget contracts declined. This implies that indirect purchases will also continue to decline. Our estimates show DoD demand, direct plus indirect, declining to around 10 percent for the past 2 years. We surveyed eight bearing manufacturers, and they provided data on their defense sales including sales of bearings to other manufacturers to be used in defense items. Between 1988 and the first quarter of 1991, their shipments to DoD averaged about 10 percent of their total shipments, providing support to our estimates of defense demand.

Although DoD plays a minor role in the industry as a whole, its role in the superprecision segment of the industry is significant. Superprecision bearings account for about 10 percent of industry shipments. They are more difficult to manufacture and are usually more expensive than the regular, or commodity grade,

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[2]*The Effect of Imports of Anti-Friction Bearings on the National Security: An Investigation Under Section 232 of the Trade Expansion Act of 1962, as Amended,* U.S. Department of Commerce, International Trade Administration, July 1988.

TABLE 2-1

DoD DEMAND FOR ANTIFRICTION BEARINGS

(Millions of current dollars)

Year	DoD direct purchases	DoD indirect purchases	Total DoD purchases	DoD purchases as a percent of domestic shipments
1980	53.9	323.4	377.3	11.6
1981	67.1	402.6	469.7	13.1
1982	81.9	491.4	573.3	19.8
1983	50.9	305.4	356.3	12.1
1984	77.7	466.2	543.9	15.4
1985	105.8	634.8	740.6	21.1
1986	92.2	553.2	645.4	19.3
1987	95.6	573.6	669.2	18.8
1988	65.7	394.2	459.9	11.8
1989	59.3	355.8	415.1	10.2
1990	58.8	352.8	411.6	9.8

Source: DD Form 350, *Individual Contracting Action Report (over $25,000).*

bearings. According to the JLC study, defense demand accounts for about 50 to 70 percent of the superprecision segment in dollar value (or about 5 to 7 percent of total U.S. consumption).

MOBILIZATION REQUIREMENTS

Both the JLC study and the DoC Section 232 study were concerned with the bearing industry's ability to meet surge and mobilization requirements. The JLC study surveyed 11 bearing manufacturers, concentrating on the superprecision portion of DoD requirements. The companies were told to use average monthly defense production in 1985 as the basis of defense demand and that the surge requirement was to double production in 1 year using current facilities. For mobilization, companies were told to allow for investment in new plant and equipment and aim to quadruple production by the end of the second year. About half of the manufacturers surveyed responded that they could meet those targets.

The Section 232 study used the mobilization scenario from the 1984 National Security Council stockpile study. DEIMS was used to project the final defense demand and the Demand Impact Transformation Tables (DITT) were used by the Federal Emergency Management Agency (FEMA) to project nondefense demand. The study divided the industry into 15 product groups and projected mobilization shortfalls in the following seven products:

- Integral shaft bearings
- Regular cylindrical roller bearings
- Needle roller bearings
- Other roller bearing
- Regular ball bearings under 30 mm O.D.
- Regular ball bearings from 30 mm to 100 mm O.D.
- Regular ball bearings over 100 mm O.D.

No shortfalls were projected for any of the superprecision product categories. Those seven products for which shortfalls were projected were studied further to determine the effect of imports. The study concludes that only two categories – regular ball bearings under 30 mm O.D. and regular ball bearings from 30 mm to 100 mm O.D. – would experience shortfalls because of high levels of import penetration.

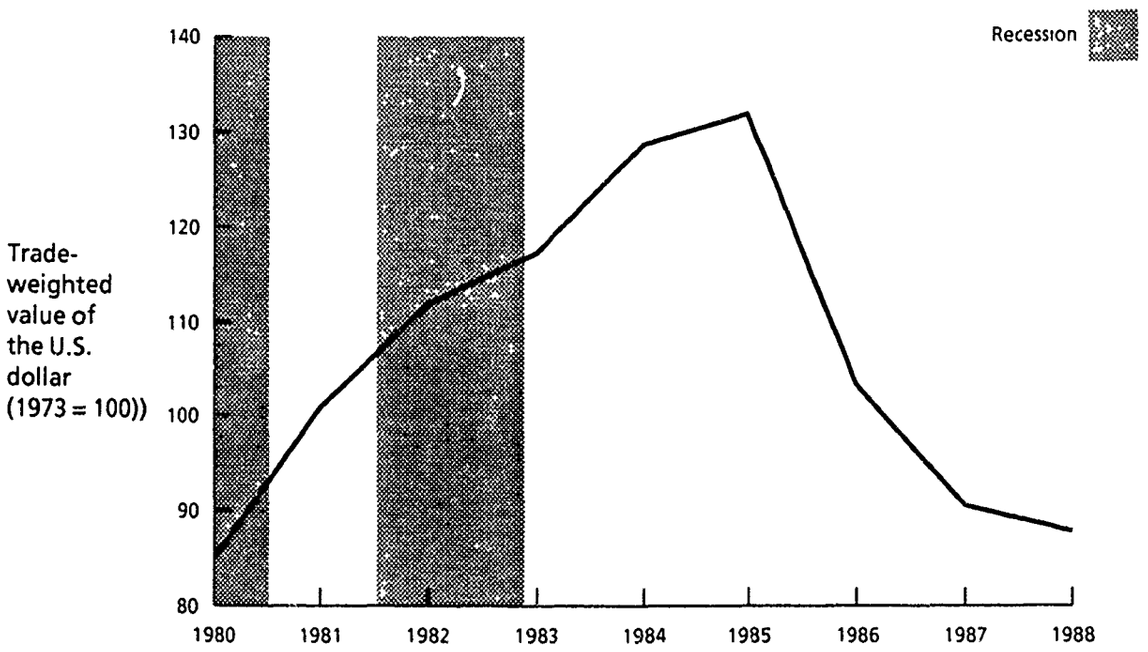
Both the JLC study and the DoC Section 232 study conclude that the bearing industry has the capacity to meet current, peacetime DoD demand and could meet most of the additional demand for surge and mobilization. However, both studies caution that imports are increasing in almost all product categories, and if that trend continues, domestic capacity may not be available for future emergencies.

CHAPTER 3

THE BEARING INDUSTRY, 1980 THROUGH 1987

GENERAL ECONOMIC CONDITIONS

Business cycles and the foreign exchange value of the U.S. dollar have a major effect on industries throughout our economy. Figure 3-1 shows the influence of those factors for the 8-year period from 1980 through 1987. The United States experienced a brief recession in 1980 followed by a severe recession in 1981–1982. During that time and on through 1985, the foreign exchange value of the dollar increased; not only were domestic markets contracting because of the recession, but U.S. companies found it difficult to compete in foreign markets because of the strength of the dollar compared with other currencies. By the end of 1987, the value of the dollar had declined almost to 1980 levels.



Sources: Value of the dollar. Board of Governors of the Federal Reserve System. Recessions. Department of Commerce, *Survey of Current Business.*

Note: The trade-weighted value is the average exchange value of the U.S. dollar compared to 11 major currencies, weighted by each country's global trade.

FIG. 3-1. ECONOMY-WIDE INFLUENCES

During the 1980s the defense buildup also affected a portion of domestic industry. Table 3-1 shows defense procurement of major end items in constant dollars (adjusted for inflation, 1982 = 100) and the annual percentage change. During the period 1981 to 1983, procurement increased between 15 and 20 percent per year. By 1986, defense procurement began to decline.

TABLE 3-1

PERCENTAGE CHANGE IN DEFENSE PROCUREMENT, 1980 THROUGH 1987

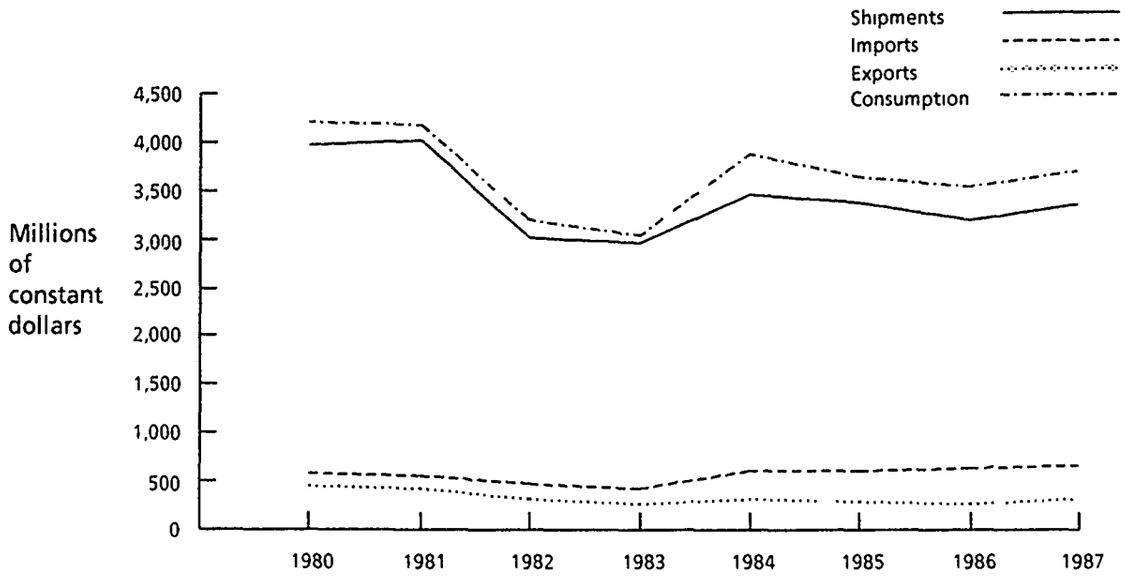
Year	Procurement (1982 dollars)	Annual percentage change
1980	$47,817	0.3
1981	56,485	18.1
1982	67,870	20.2
1983	77,774	14.6
1984	80,144	3.0
1985	88,499	10.4
1986	81,566	– 7.8
1987	79,229	– 2.9

Source: DD Form 350, *Individual Contracting Action Report (over $25,000).*

CONDITIONS IN THE BEARING INDUSTRY, 1980 THROUGH 1987

Figure 3-2 shows trends in bearing industry shipments, imports, exports, and consumption in constant dollars. (Appendix Table B-1 provides the data for Figure 3-2.) The effect of the severe recession in 1981 – 1982 is shown by the decline in shipments and consumption in 1982 and 1983. The figure shows shipments and consumption increased in 1984 but remained flat for the next 3 years. By 1987, the dollar value of domestic shipments was still about 15 percent below the level of shipments in 1980 and 1981.

During the 1980 through 1987 period, imports of bearings increased and exports declined. In constant dollars, imports increased 16.7 percent and exports declined 28.5 percent. Bearing exports reached a low point of $253 million in 1983 after the



Source: Appendix Table B-1

FIG. 3-2. BEARING INDUSTRY, 1980 THROUGH 1987

recession. The increase in imports coupled with lower domestic production meant that import penetration increased from 14 percent in 1980 to 18 percent in 1987.

General economic factors and industry conditions also affected profitability and capital investment. Table 3-2 shows net profit before taxes as a percentage of sales for the years 1977 through 1987 for the bearing industry and for all manufacturing industries combined. Prior to the 1981 – 1982 recession, the bearing industry earned rates of return comparable to those of all manufacturing industries combined. From 1983 to 1987, it did not reach previous levels of profitability and tended to earn returns 2 to 3 percentage points below the average for all manufacturing industries. Capital investment also suffered during this period. Investment in the bearing industry declined 10.5 percent a year on average in constant dollars compared to investment in the manufacturing sector, which declined at an average rate of 2.8 percent per year in constant dollars.

During the period 1980 through 1987, the bearing industry lost employees at a greater rate than the manufacturing sector as a whole. Table 3-3 shows that the bearing industry lost production workers at an average annual rate of 5.4 percent per year while the manufacturing sector lost employees at an average annual rate of

TABLE 3-2

RETURN ON SALES FOR THE BEARING INDUSTRY

(Percentage)

Year	Bearing industry	All manufacturing
1977	7.6	8.6
1978	8.9	8.8
1979	7.3	8.8
1980	9.3	7.6
1981	4.8	7.4
1982	5.6	5.3
1983	4.3	6.3
1984	2.6	7.1
1985	4.0	5.9
1986	3.8	5.8
1987	4.0	7.3

Source: Bearing industry: Robert Morris Associates, *Annual Statement Studies* Manufacturing: Department of Commerce, *Quarterly Financial Reports*

Note: Return on sales = net income before taxes/sales.

TABLE 3-3

LABOR FORCE PARTICIPATION AND EARNINGS

	Year		Average annual percentage change
	1980	1987	
Production workers (thousands)			
Bearing industry	43.2	29.2	- 5.4
All manufacturing	13,900.1	12,259.5	- 1.8
Average hourly wages (constant dollars: 1982 - 1984 = 100)			
Bearing industry	9.58	9.62	0.1
All manufacturing	8.82	8.72	- 0.2

Source: Appendix Table B-2

1.8 percent. However, wage rates in the bearing industry were higher than the average of all manufacturing in 1980 and kept pace with inflation, giving bearing industry production workers a slight increase in real wage rates over the period. In comparison, production workers in the manufacturing sector showed slight declines in real wage rates.

In summary, by 1987 the bearing industry was experiencing difficulties. While the manufacturing sector, in general, was recovering from the 1981–1982 recession, neither bearing shipments, nor profitability attained levels existing prior to the recession. Despite a decline in the foreign exchange value of the dollar, imports continued to increase while exports declined. The industry sought relief from unfair trade practices of foreign competitors and on the basis of national security. In 1987, the industry began to receive relief.

CHAPTER 4

RELIEF MEASURES

Several avenues of relief from foreign competition are available to U.S. industry. DoC and ITC investigate all allegations of unfair trade practices, including the effects on the national security, and implement relief measures when necessary. The statutes pertaining to unfair foreign competition designate DoC as the administering authority; it is responsible for determining whether foreign goods are likely to be sold in the United States at "less than fair value." ITC is responsible for determining whether a domestic industry has been harmed or is likely to be harmed by the importation of goods at less than fair value. DoC issues and administers antidumping duties when they are imposed. DoD also has the authority to provide assistance to domestic industries that are critical to national security.

RELIEF MEASURES AVAILABLE THROUGH DoC AND ITC

Dumping occurs when a foreign manufacturer sells products in the United States at prices lower than those in the home market. DoC or any interested party may initiate an investigation of dumping allegations. An interested party can be a foreign or domestic manufacturer, a trade association, or a union whose members are potentially affected. If the investigation shows that dumping has occurred, antidumping duties, equal to the difference between the foreign market value and the U.S. price, are imposed.[1] Antidumping duties are imposed on individual companies within a foreign country based on the price differentials defined above, i.e., each company within a country can have a different price margin and, therefore, different levels of antidumping duties.

While dumping is associated with an individual company, countervailing duties are associated with a foreign governments' behavior. When a foreign country provides either direct or indirect subsidies to exports, the United States can impose a

[1] 19 U.S.C. 1677b defines foreign market value as the price at which goods are sold in the home market, or, if the home market is too small to form a base, the price at which the foreign goods are sold for export to other countries. The U.S. price is the price at which foreign companies offer the goods for sale in the U.S. market.

countervailing duty equal to the amount of the subsidy. Subsidies can take many forms, including the following:

- Provision of debt or equity capital at below market rates
- Provision of goods or services at preferential prices
- A grant of funds to cover operating losses
- Assumption by the government of any costs of manufacturing or distribution.

In recent years, several allegations of dumping or subsidization have been made against foreign bearing manufacturers who export to the United States. In 1987, antidumping duties were imposed on tapered roller bearings from Hungary, Italy, Japan, the People's Republic of China, Rumania, and Yugoslavia in response to a petition submitted by The Timken Co. Those antidumping duties affected about 10 percent of U.S. bearing imports.

In response to a petition from the Torrington Co., DoC conducted an investigation of imports of antifriction bearings other than tapered roller bearings from several countries and published their preliminary determination in May 1988. ITC determined that the U.S. domestic industry was being injured by subsidized imports from Singapore and Thailand. The United States has imposed countervailing duties of 2.34 percent on Singapore and 21.54 percent on Thailand. As a result of the same investigation, the United States imposed antidumping duties on companies in Germany, France, Italy, Japan, Rumania, Singapore, Sweden, Thailand, and the United Kingdom. The duties differ on the basis of product classes and range from 0.65 percent to 212 percent. Since several categories of bearings were covered by the investigation and several major sources of imports were investigated, these antidumping duties affect about 70 percent of U.S. imports.

Foreign producers may request a re-evaluation of the antidumping duties each year on the anniversary of the imposition of the duties. DoC recently released preliminary findings of a re-evaluation for the countries listed above. Based on price information submitted by the companies and other information gathered by DoC, the margins were adjusted, with some decreasing and some increasing.

Statutory provisions at 19 U.S.C. 1862 give DoC and ITC the authority to assess the effect of imports on national security and on domestic capacity needed to meet

national defense requirements.[2] Imports need not be priced at less than fair value. The investigating agency has the authority to examine a broad range of effects including those on employment, skills, investment, and any other areas affected by the displacement of domestic goods by foreign imports. The statute allows the investigating agency to consider the impact of imports on both the current condition of the domestic industry and the future growth of that industry. The President can adjust the level of imports (quotas) in response to a finding that national security is threatened or impaired.

In 1987, the AFBMA petitioned DoC to conduct an investigation of the impact of bearing imports on national security. DoC found potential shortfalls in domestic production resulting from high levels of imports in regular precision bearings under 30 mm O.D. and regular precision bearings 30 mm to 100 mm O.D.; it also found that continued growth in imports could cause further erosion of domestic bearing capacity in a number of other product lines. DoC recommended that the President take no action on the results of its investigation until the results of DoD's initiatives to improve the health of the bearing industry were analyzed.

ACTIONS TAKEN BY DoD

A number of authorities allow DoD to restrict purchases of defense items to those manufactured in the United States and Canada. The National Security Act of 1947 (50 U.S.C. 404) and the Defense Production Act of 1950 (50 U.S.C. Appn. 2061 et seq.) provide broad authority to maintain production for national emergencies. Executive Order 11490, Defense Mobilization Order II, and National Security Decision Directive No. 47 provide for the implementation of that broad authority. The Competition in Contracting Act (CICA) at 10 U.S.C. 2304(c)(3) allows DoD to award contracts to particular sources to establish or preserve production capability for national emergencies.

In 1971, DoD placed a restriction in the Armed Services Procurement Regulation requiring antifriction bearings under 30 mm O.D. to be purchased from domestic sources. In August 1988, DoD restricted the purchase of bearings over 30 mm O.D. The restriction applies to all bearings, components, and end items containing bearings purchased by DoD, unless the item purchased is a commercial

[2]These assessments are often referred to as Section 232 studies because the original provision appeared in Section 232 of the Trade Expansion Act of 1962.

product. The restriction is in effect for 3 years and expires 30 September 1991. At that time, DoD will decide whether to extend the restriction for an additional 2 years.

The DoD Inspector General (IG) audited the implementation and enforcement of the restriction in contracts for FY88 and FY89. The IG report concluded that the restriction on bearings under 30 mm O.D., imposed in 1971, was adequately enforced.[3] However, the report also concluded that compliance with the newer restriction on bearings over 30 mm O.D. was not well implemented and was not always included in DoD contracts when required. Also, even when the clause was included, DoD personnel were not ensuring that contractors certified that the bearings supplied were manufactured domestically. The IG investigators looked at 38 contracts and found that 26 did not include the required clause. Ten of the 26 contracts were awarded soon after the restriction took effect and may have been too far into the award process to add a new clause. However, 16 contracts (about 40 percent of those examined) did not contain the clause as late as 10 months after the restriction was imposed. In addition, the IG found one instance of a contract for $80,000 that was awarded to a foreign manufacturer without the necessary waiver. The contracting activities concurred with the IG findings and all took steps to ensure that the clause would be included in future solicitations and contracts.

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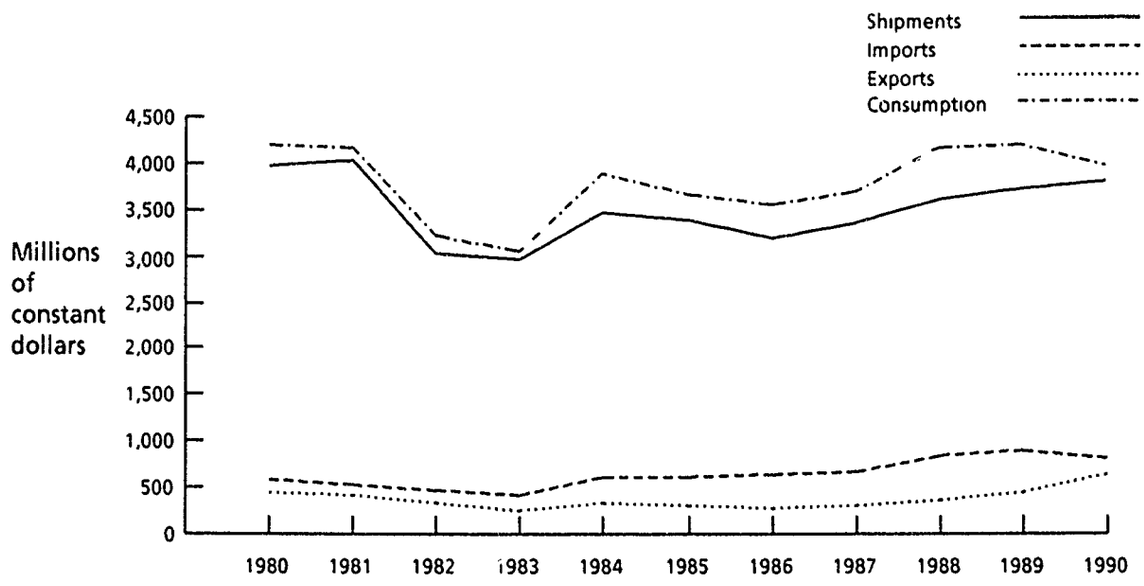
[3]*Restrictive Contract Clauses on Antifriction Bearings*, Office of the Inspector General, Audit Report No. 91-038, 30 January 1991.

CHAPTER 5

THE CURRENT STATUS OF THE INDUSTRY

THE CONDITION OF THE BEARING INDUSTRY, 1988 THROUGH 1990

The health of the antifriction bearing industry has improved in the last 3 years. Figure 5-1 shows shipments, consumption, imports, and exports in constant dollars, for the 11-year period 1980 through 1990 (it extends the data shown in Figure 3-2 by 3 years). Domestic shipments and exports increased each year since 1987. In constant dollars, exports nearly doubled by the end of 1990, from the 1987 total of $321 million. Imports also increased in 1988 and 1989 but decreased by 9 percent in 1990.



Source: Appendix Table B-1

FIG. 5-1. BEARING INDUSTRY TRENDS

Changes in profitability are more difficult to assess because timely data are not readily available. However, since the DoD restriction was only in effect for 3 years, the current levels of profitability should be examined. Table 5-1 shows available profitability data from 1978 through the first half of 1991. Return on sales (ROS),

measured as profit divided by sales, is the profitability measure reported in Table 5-1. No source provides a continuous series of profitability data that allows us to compare profitability before the imposition of the relief measures to profitability at the present time. The sources provide different measures; three report before-tax returns and the fourth, Dun & Bradstreet (D&B), reports after-tax figures. Different firms and different numbers of firms are used by each source. Robert Morris Associates (RMA) and D&B have the largest samples, around 25 to 35 companies in recent years. The AFBMA annual report has the smallest sample, about 12 firms. Neither RMA, D&B, nor AFBMA attempt to survey the same group of companies each year so the number and identities of the firms providing data can differ slightly from year to year. Furthermore, both the AFBMA annual report and the most recent investigation from ITC surveyed only ball bearing manufacturers, even though the figures presented are for all operations of those companies.

TABLE 5-1

PROFITABILITY MEASURES, 1978 THROUGH 1990

(Percentage)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1st half 1991
RMA before-tax ROS	8 9	7 3	9 3	·C	5 6	4 3	2 6	4 0	3 8	4 0	4 5	n/a	n/a	n/a
D&B after-tax ROS					11.4	2 0	N/A	5.2	5 0	3 7	2.5	4 0	5.0	n/a
ITC – 1991 preliminary determination before-tax ROS											3 2	4.8	2 0	n/a
AFBMA – 1989 annual report before-tax ROS							10 1	1 5	1 1	1 1	0 3	9 4	n/a	n/a
Producer price index – bearings (constant-dollar PPI) 1983 = 100	0 898	0 909	0 972	1.020	1 043	1.004	0.996	0 995	0.981	0 955	0 980	1 033	1 042	1 057
Percentage change constant-dollar PPI		1 2	7 0	4 9	2 2	-3 7	-0.8	-0.1	-1 5	-2 6	2 7	5 4	0 9	1.4

Note: n/a = not available, PPI = producer price index

Even with the above caveats, some conclusions can be drawn from these data. All the sources show reduced returns after the recession in 1981 – 1982. Profitability improves after 1984 but never reaches the levels obtained in the early part of the decade. All sources with current data show an increase in profitability in 1989;

however, data for 1990 are mixed and thus we cannot confirm that profitability continued to improve through 1990.

Because of the problem of obtaining a continuous and current series of profitability data, we sought a proxy measure to provide information on profitability in the bearing industry. The producer price index (PPI) measures the trend of output prices in an industry. When deflated to account for the effects of inflation, the constant-dollar PPI measures the trend of output prices relative to the trend in input prices. If the percentage change in constant-dollar PPI is positive, that means that producers are raising the prices of their outputs faster than the prices of their inputs are increasing, and profit margins are increasing. Likewise, if the percentage change in constant-dollar PPI is negative, then margins should decrease because input prices are rising faster than producers can increase the prices of their outputs. We have some evidence that the PPI is a reasonable proxy for trends in profitability in the antifriction bearing industry. When constant-dollar PPI for Standard Industrial Classification (SIC) 3562, the ball-and-roller-bearing industry, is regressed against the longest profitability series from RMA, the simple correlation coefficient is a highly significant 0.69.

Table 5-1 shows the constant-dollar PPI for SIC 3562 for the years 1978 through 1990 and the first half of 1991. The year-to-year percent changes in constant-dollar PPI give an indication of whether profitability should be rising or falling. The PPI series shows declines for each year from 1982 through 1987. The other sources of profitability data agree that these years were not ones of high or improving profitability. It also shows a substantial increase for 1989, which also conforms with the other data sources that showed substantial increases in profitability in 1989. The constant-dollar PPI also increased in the first half of 1991, indicating that margins continued to improve slightly.

Capital investment in an industry is related to the level of profitability since investments are made in response to profit opportunities. Capital investment by the bearing industry shows this relationship. The most recent high point of investment by the industry is 1980 with an investment of $286 million in constant dollars. The high point corresponds to the largest increase in the constant-dollar PPI; 7 percent in 1980. The low point in capital investment was 1983 when the industry invested only $110 million in constant dollars. That point corresponds to the largest percent decline in the constant-dollar PPI; 3.7 percent in 1983. Our survey of antifriction

bearing manufacturers shows that the eight respondents reported constant-dollar capital investments of $173 million for 1990 ($228 million in current dollars), providing additional support for improving profitability in the industry.

ANALYSIS OF INDUSTRY PROFITABILITY

We analyzed industry profitability to determine the extent to which bearing industry profitability is influenced by the business cycle of major user industries, the foreign exchange value of the dollar, and the relief measures begun in 1988. The behavior of profitability of a single industry can be measured over time by ROS also referred to as *margin*.[1]

We have data on ROS from RMA and D&B. Unfortunately, each source uses different definitions, includes different companies in their samples, and covers different time periods. We conducted separate analyses using each data source. RMA measures before-tax ROS using 20 to 23 firms, depending on the year, and covers the period 1978 through 1988. D&B measures after-tax ROS using 17 to 30 firms, depending on year, and covers the period 1982 through 1990. Thus, D&B offers the advantage of including years when the relief measures were in effect but covers 2 fewer years.[2]

Analysis Results

We used regression analysis to establish the relationship between profitability and the explanatory variables; business cycles, the exchange value of the dollar, and the relief measures. Results of the analyses are summarized in Table 5-2. Values presented in Table 5-2 are estimated linear regression coefficients for the independent (explanatory) variable used in each equation. An X under the second or third column of Table 5-2 indicates whether RMA or D&B profit data were used. Also presented is an indication of the statistical significance of each coefficient and the overall explanatory power (R^2) of the regression.

In the first two equations, we sought to establish a relationship between profitability in the bearing industry and economic activity in major using sectors (shipments in the automobile and industrial machinery industries). We anticipated

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[1]Comparison of the ROS across different industries is inappropriate since turnover (the ratio of sales to investment) can differ widely across industries.

[2]Because of a typographical error in the D&B series, no data are reported for the bearings industry in 1984.

that profitability would be positively related to activity in those sectors. Instead, RMA's profitability measure displayed a significant but inverse relationship – higher profitability when user activity is low – and D&B's profitability measure was unrelated to user activity. Thus, economic results for the bearing sector appear to be unrelated to the business cycle influences we would expect as measured by demand from major using sectors.

TABLE 5-2

REGRESSION RESULTS

Equation	Dependent variable		Independent variables				R^2	DF	Comments
	ROS RMA 1978 – 1988	ROS D&B 1982 – 1990	Constant	User shipments	Foreign exchange value of the dollar	Percentage change bearing real price index			
1	X		14 28	– 2.5[a]			0.55	9	Significant but wrong sign.
2		X	11 13	– 1.5			0.17	6	Not significant.
3	X		13 13		– 0.071[a]		0 39	9	Significant but foreign exchange value of dollar has not changed since relief. Data stops in 1988.
4		X	2.3		– 0 22		0.02	6	Not significant
5	X		16 49	– 1.95[a]	– 0 038		0 64	8	User shipments significant but wrong sign. Foreign exchange value of dollar is not significant
6		X	15 8	– 1.89	– 0.0268		0 19	5	Neither variable significant
7	X		4 64			0 4012[a]	0.48	8	Constant-dollar PPI good proxy for profitability

Note: DF = degrees of freedom.

[a] Significant at the 95 percent level

Equations 3 and 4 in Table 5-2 test for the influence of the foreign exchange value of the dollar on industry profitability. A high dollar value should make imports more competitive in the U.S. market and U.S. exports less competitive abroad. Thus, we expect an inverse relationship between profitability and the foreign exchange value of the dollar. Equation 3 confirms such a relationship with the RMA profitability measure. However, Equation 4 shows no such relationship with the more current D&B data. Even if changes in the foreign exchange value of the dollar

affect profitability, the relatively stable dollar since the imposition of relief and the recent improvement in industry profitability contradict that relationship.

Equations 5 and 6 combine the two independent explanatory variables: user shipments and foreign exchange value of the dollar. Combining these variables produces little change from the results observed in the separate regressions. The only exception is that the foreign exchange value of the dollar is no longer statistically significant with the RMA data.

Our final test is designed to show how changes in the constant-dollar price of bearings influence profitability. Only the RMA data series was used because we used year-to-year percentage changes and the longer series was necessary to produce enough observations. The significant relationship shown supports our hypothesis that increasing prices relative to production costs are related to enhanced profit margins and industry profitability.

Relative Impact of Countervailing Duties and DoD Restrictions

Based on our elimination of business cycles and the value of the dollar as causes of improved profitability in the bearing industry, we infer that the recovery is attributable to trade relief measures. We now examine the general effects of trade relief measures and estimate the relative degree of relief afforded the industry by antidumping duties and by the DoD restriction. We calculate an upper and lower bound for the benefits from each type of relief measure. The economic effects of duties are discussed first.

Antidumping and Countervailing Duties

In 1987, antidumping duties were imposed on tapered roller bearings from Hungary, Italy, Japan, the People's Republic of China, Rumania, and Yugoslavia. In 1989, antidumping and countervailing duties were imposed on ball and cylindrical roller bearings manufactured by various European and Far Eastern countries. These duties were substantial in size in many cases and covered nearly two-thirds of imports.

As a general proposition, duties imposed on imported products raise domestic prices, stimulate domestic production to replace imports, and raise revenue for the government imposing the duties. The domestic industry receives benefits in the form of additional revenue received from higher prices and added quantities sold.

Figure 5-2 illustrates the analysis for the computation of duty-generated additional sales for the domestic industry. Curves D and S_d are the domestic demand and supply, respectively, for the bearings industry. Without trade, production and pricing would occur at their intersection, Point E. Under free trade, foreign supply (assumed perfectly elastic) would be added to domestic supply to give overall supply, S_d+S_f. Equilibrium would then occur at Point F with imports being Q_1Q_3; domestic production, Q_1; and price, P_1.

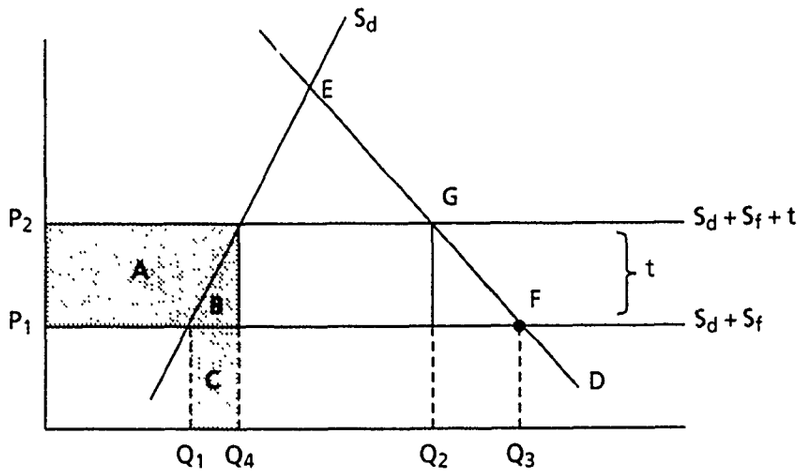

FIG. 5-2. EFFECTS OF A DUTY

A duty of t percent (*ad valorem*) would shift supply to S_d+S_f+t. That shift would produce a new equilibrium at G where imports would fall to Q_4Q_2, domestic production would increase from Q_1 to Q_4 and price would increase by t percent from P_1 to P_2. Additional revenue is given by the area (A+B+C), which is the price increase (P_2-P_1) times the higher quantity of domestic output, Q_4, plus additional output (Q_4-Q_1) evaluated at old price, P_1. However, benefits to the domestic industry are less than the entire shaded area (A+B+C) since Area (B+C) represents added costs incurred by domestic producers to expand production from Q_1 to Q_4. Thus, net additional revenue to the domestic industry is given by Area A, which is the difference between total additional revenues (A+B+C) and additional costs (B+C).

The upper bound of relief from the duties is Area A, *approximated* by computing the rectangle (A+B). That is a good approximation when Area B is small, i.e., when

the supply curve is inelastic and little additional output is forthcoming as price increases.

In terms of the t percent duty, our approximation of Area (A+B) is

$$(A+B)=Q_4\times(P_2-P_1)=Q_4\times tP_1$$

but

$$\text{Sales (S)}=Q_4\times P_2,$$

so

$$(A+B)=\frac{(SP_1t)}{P_2}=St\left(\frac{P_1}{P_2}\right);$$

but

$$P_2=P_1(1+t),$$

so

$$(A+B)=S\times\left[\frac{t}{(1+t)}\right].$$

Thus,

$$\text{additional benefits}=S\times\left[\frac{t}{(1+t)}\right],$$

where

S=sales in 1990

t=percentage duty rate.

To compute additional industry benefits, we now need to compute the weighted average duty rate (t) based on duty rates for each type of bearing-assessed duties. Table 5-3 shows our computation of the average duty rate weighted by the quantity of imports from each country. Ball bearings are the most important type with imports

of $462 million and a weighted average duty of 40 percent. Tapered rollers have a much lower average duty of 7 percent because the duties are low and few countries are subject to duties. Cylindrical rollers, although of much less importance in terms of imports, have a high weighted average duty of 38 percent.

TABLE 5-3

WEIGHTED AVERAGE ANTIDUMPING DUTIES

Country	Type					
	Ball bearings		Tapered roller bearings		Cylindrical roller bearings	
	Imports ($000)	Duty (percentage)	Imports ($000)	Duty (percentage)	Imports ($000)	Duty (percentage)
Germany	50,048	67.65			22,727	59.20
France	12,155	62.60			4,524	15.57
Italy	9,394	126.60	1,769	124.75	869	212.45
Japan	184,643	56.50	40,168	12.01	10,885	20.52
Rumania			668	8.70		
Singapore	61,178	27.42				
Sweden	1,763	180.00			626	13.69
Thailand	3,664	41.94				
U.K.	9,491	53.19			4,190	43.44
Total	462,156	39.86 (weighted average)	100,968	7.02 (weighted average)	53,119	37.92 (weighted average)

Sources: Imports Department of Commerce, FT 925, import-export data, 1990 Duties Department of Commerce, final dumping margins, May 1989

Table 5-4 shows our computation of additional industry benefits. We apply the formula, additional benefits=sales$\times$[t/(1+t)], to sales subject to the duty, namely, domestic production less exports less DoD sales. We have made the calculation for each bearing type and then summed them for a total of $389,110,000 worth of additional revenue as an upper bound.

To estimate the lower bound benefit, we used price increases represented by the constant-dollar PPI for ball and roller bearings shown in Table 5-1. The constant-dollar PPI was 0.980 in 1988, 1.033 in 1989, 1.042 in 1990, and 1.057 through the first half of 1991 (1983 is the base index of 1.00). If we apply the cumulative price increase of 7.9 percent to the revenue base (U.S. production minus exports minus DoD shipments) — recognizing that the revenue base includes the duty-generated higher

TABLE 5-4

BENEFITS CALCULATION

($000)

Parameter	Ball bearings	Tapered roller bearings	Cylindrical roller bearings	Total
U.S. production	1,582,017	857,154	240,228	2,679,399
Exports	212,139	152,890	43,068	408,097
Shipments to DoD	297,419	15,428	61,498	374,345
Revenue base (production – exports – shipments to DoD)	1,072,459	688,836	135,662	1,896,957
t/(1 + t)	0.285	0.067	0.275	—
Revenue base × t/(1 + t)	305,651	46,152	37,307	389,110

prices – we get the same formula; additional benefits = sales × [π/(1 + π)] where π is the price increase shown by the constant-dollar PPI. Since π = 0.079, and the sales base from Table 5-4 equals $1,896,957,000, we find the lower limit for additional benefits is $138,887,000. We thus conclude that the duties added between $138,887,000 and $389,110,000 annually or about 3 to 9 percent to total industry revenues.

DoD Restrictions

The DoD restriction is essentially a quota, limiting the physical quantity of bearings imported into the United States. In this case, the quota is absolute, prohibiting the importation of any foreign-made bearing for items, other than commercial items, destined for DoD use. The effect of the DoD restriction is to raise domestic prices and increase domestic output in comparison to the prerestriction situation. DoD pays higher prices for those items that previously were purchased from low-bid foreign sources that must now be bought from higher priced domestic sources. Again, we provide an upper and lower bound for the benefit to U.S. producers and demonstrate that the DoD restriction is much less potent than the duties.

To set a lower bound, we estimate the additional revenues received by domestic sources who now win procurements because foreign sources are precluded from competition.[3] We use rough estimates provided by the Defense Industrial Supply Center (DISC) to calculate the increased revenue to domestic producers. DoD demand (both direct and indirect) is estimated to be approximately $410 million. Discussion with DISC indicates that about 5 percent of total DoD purchases formerly went to foreign sources and now go to domestic sources at higher prices. Furthermore, large price increases, as high as 30 to 35 percent, have occurred on those buys. Therefore, if we apply an average 33 percent price increase to 5 percent of DoD's $410 million worth of bearing purchases we get $410 million × 33 percent price increase × 5 percent = $6.8 million in added revenues.

To set an upper bound, we start with Bureau of the Census data that indicate overall import penetration into the total U.S. market (civil and military) of 17 to 20 percent. Foreign penetration of the DoD market is probably less and certainly no greater than the overall 17 to 20 percent. Assume as an upper limit that all foreign purchases by DoD are at higher prices and that import penetration in the defense market is at the upper limit of 20 percent. Then the revenue increases are 20 percent × $410 million × price increase of 33 percent = $27.1 million. Thus, we estimate that the benefits to U.S. producers from the DoD restriction range from a low of $6.8 million to a high of $27.1 million with a most likely value in between. When those values are compared to the $139 million to $389 million estimate of additional revenue that comes from the antidumping duties, the duties clearly produce much greater benefit to the domestic industry.

[3]Duty estimates are slightly overstated because we include bearings under 30 mm O.D. We are not considering the restriction on those bearings at this time.

CHAPTER 6

POLICY OPTIONS FOR DoD

This chapter discusses the arguments for and against a number of policy options for DoD to assure that the bearing industry will be able to meet defense requirements in the event of a national emergency. We discuss the following options:

- Renew the restriction for an additional 2 years
- Allow the restriction to expire
- Extend the antidumping duties to DoD bearing purchases
- Protect domestic manufacturers by using a contract award evaluation factor based on price and/or percentage of domestic content
- Continue the restriction for only those categories of bearings most critical to DoD.

RENEW THE RESTRICTION FOR AN ADDITIONAL 2 YEARS

Several arguments can be made for continuing the restriction for an additional 2 years. Renewing the restriction precludes the possibility that countries with MOUs will dump in the DoD market particularly in the superprecision segment. DoD has negotiated MOUs with most of our NATO allies plus Sweden and Israel to encourage open access to each other's defense markets. While the Buy American Act controls non-MOU-country manufacturers' access to the U.S. defense market through contract award price evaluation factors and domestic content requirements, firms in MOU countries compete on an equal basis with U.S. sources. Since 1988, a statutory provision prohibits the application of countervailing and antidumping duties on merchandise from countries with DoD MOUs.[1]

The antidumping duties imposed on non-DoD bearing imports raise domestic prices in the commercial market. Those duties create an inequality between the commercial and defense markets for MOU sources since the defense market would be unrestricted for them and the duties would not apply. Thus, MOU sources would

[1] 19 U.S.C. 1677(20)(B).

have a potential advantage over domestic sources in the defense market but not in the commercial market. For that reason, the DoD bearing market would be open to the possibility of dumping by MOU country manufacturers. The high-value "over 30 mm O.D." superprecision segment is particularly vulnerable because of the high proportion of defense purchases.

Another argument for continuing the restriction is that it has encouraged foreign manufacturers to invest and transfer DoD production capacity to North America. Although domestic firms may not see this as a benefit, it is beneficial for DoD to have that capacity in North America even if the firms are foreign owned. Domestic manufacturers report increases in their defense business and have increased their capital investment substantially.

A third argument favoring continuation of the restriction is that 3 years is not adequate for domestic industry to make the required investment and consolidate its market position. Domestic manufacturers claim that DoD implementation of the restriction was not timely nor did it flow down appropriately; they further claim that foreign bearings were knowingly or unknowingly supplied to DoD despite the restriction. Also, multiyear and requirements contracts in existence before 1989 were not covered by the restriction; therefore, those items would be subject to the restriction for less than the intended 3 years.

Continuing the restriction also has a number of disadvantages. The bearing industry has shown many signs of recovery since 1987. Profitability has rebounded although not to the levels experienced in the late 1970s and early 1980s. Domestic shipments, exports, and capital investment have all increased since 1987. No direct evidence suggests that DoD has lost significant capacity in critical segments such as superprecision bearings.

The restriction has resulted in higher prices for DoD. Although DISC has not been required to formally document bearing price increases associated with the restriction, contracting officers responsible for bearing purchases estimate that prices have increased by an average of 30 percent when the restriction leaves a single domestic source from which to purchase bearings. This scenario occurs in a relatively small percentage of the DISC bearing purchases. When two or more domestic firms are competing, price increases have been smaller. While no information is readily available on indirect bearing purchases, we assume that similar price increases

occurred when the restriction left prime contractors with only one domestic bearing manufacturer. Despite the DoD price increases, our analysis indicates that domestic bearing manufacturers received far more financial benefit from the antidumping duties than from the DoD restriction.

In addition to higher bearing prices, DoD is paying administrative costs associated with the restriction. Those costs result from administering and enforcing the restriction, obtaining waivers of the restriction from the head of the contracting activity, and requiring increased time to award contracts. Contract awards may take longer because of waiver processing, locating domestic sources, and handling noncompetitive actions that would have been competitive without the restriction. Delays in award ultimately affect the end user of the bearings by lowering supply availability and increasing backorders.

The restriction also reduces DoD's sources for bearings. Fewer sources limit DoD's flexibility in awarding contracts based on other factors, such as delivery time. Furthermore, countries with MOUs feel that DoD purchase restrictions run counter to the spirit of the MOUs and may retaliate.

ALLOW THE RESTRICTION TO EXPIRE

The advantages and disadvantages of allowing the DoD restriction to expire are essentially the inverse of the advantages/disadvantages discussed under the above option. In summary, arguments for allowing the restriction to expire are that the benefits to the manufacturers come mainly from the antidumping duties; that the bearing industry exhibits many signs of recovery and is no longer in severe trouble; that DoD will benefit from lower prices, reduced administrative costs, and more sources; and that the restriction is contrary to the spirit and intent of the DoD MOUs.

Arguments against allowing the restriction to expire are that it provides an opportunity for bearing manufacturers in MOU countries to dump bearings in the DoD market; that DoD may lose domestic bearing capacity to foreign firms; that the current restriction encourages investment in North American manufacturing facilities; and that the existing restriction has not been as effective as it should have been because of inadequate implementation by DoD.

EXTEND THE ANTIDUMPING DUTIES TO DoD BEARING PURCHASES

Extending the antidumping duties to DoD purchases would make the DoD market comparable to the non-DoD market. The duties would provide the domestic bearing market with protection against dumping, and DoD would be purchasing bearings in the same environment as other businesses, consistent with efforts to have DoD utilize commercial practices to a greater extent. Another advantage of applying the duties to DoD bearing purchases is that they target only those categories in which dumping occurs. A restriction, on the other hand, prevents foreign firms from competing at all.

Another advantage of extending the duties to DoD purchases is the ease of administration for DoD. DoC sets and adjusts the duties, and Department of Treasury collects them through existing procedures. The additional revenues would flow to domestic manufacturers through DoD contracts so there would be no net gain or loss by the Government. DoD would be freed from the administrative burden of preparing waivers, obtaining certifications, and processing additional single-source acquisitions. The most difficult aspect of administering the current restriction has been enforcing it for subcontracts. By applying the antidumping duties to DoD bearing purchases, this problem would disappear and domestic bearing manufacturers would no longer be placed in the uncomfortable position of exposing violators among their customers.

The single biggest roadblock to this policy option is that it requires a statutory change since current law prohibits the application of antidumping duties to imports of merchandise for defense use of any country having an MOU with DoD. Another disadvantage of this policy option is that it would raise the price of bearings from MOU country firms. Also, even though competition would exist between U.S. and MOU country sources, the MOU countries could argue that the application of the duties violates the spirit and intent of the MOUs.

PROTECT DOMESTIC MANUFACTURERS BY USING A CONTRACT AWARD EVALUATION FACTOR BASED ON PRICE AND/OR PERCENTAGE OF DOMESTIC CONTENT

This option would provide protection to domestic sources by imposing a contract award evaluation factor based on price and/or domestic content percentage. The policy would be administered in a fashion similar to that of the Buy American Act.

For example, a contract award evaluation factor could be applied to the price of any foreign bearings competing for a DoD contract. The evaluated price would then be compared with domestic bearing offers to determine the low price. An evaluation factor would work best for direct bearing purchases but would be difficult to apply to indirect purchases by prime contractors. For indirect purchases, a prime contractor could be required to certify that a specified percentage of bearings contained in end items are of domestic manufacture.

The advantage of this option is that it provides some protection to domestic manufacturers while limiting the amount of price increases for DoD. Disadvantages of this option are that it is hard to administer, especially beyond first-tier contracts; it would further complicate the already complex Buy American evaluation procedures; and it conflicts with provisions in the MOUs, which state that price differentials will not be applied to MOU sources.

CONTINUE THE RESTRICTION FOR ONLY THOSE CATEGORIES OF BEARINGS MOST CRITICAL TO DoD

This option has many of the advantages and disadvantages of the first option, but targets only those bearing categories that are critical to DoD's interests. Defense items use a significant portion of the high-value superprecision segment of the industry, and DoD has judged that segment to be the most critical in meeting future needs. This option provides protection to domestic manufacturers of a critical segment while allowing competition in the commodity segment over 30 mm O.D. However, countries with MOUs may also protest a partial restriction.

APPENDIX A

RESULTS FROM BEARING MANUFACTURERS' QUESTIONNAIRE

RESULTS FROM BEARING MANUFACTURERS' QUESTIONNAIRE

BACKGROUND

To supplement our analysis of the bearing industry, we sent a questionnaire to nine firms with domestic manufacturing capacity. We requested information on production and capacity, bottlenecks, lead times, capital investment, labor requirements, research and development, technology, trade impacts, and competitiveness.

Eight of the nine firms responded to the questionnaire. As a group, these firms represent approximately 60 percent of domestic bearing shipments in terms of dollars. To ensure confidentiality, we have not identified comments with the firm providing them, and we have not disclosed summary statistical data that could reveal the source. A blank copy of the survey is included at the end of this appendix.

PRODUCTION AND CAPACITY

Data on ball bearing, roller bearing, and bearing component shipments were collected for 1988 through the first quarter of 1991. Shipments in both units and dollars were requested, and the data were reported separately for defense and nondefense shipments. The respondents provided actual shipment data or estimates if data were unavailable. Tables A-1 through A-4 summarize the results.

Tables A-1 and A-2 show bearing shipments in dollars for the defense and nondefense sectors, respectively. Defense shipments average 10.2 percent of these firms' shipments. DoD accounts for a large share of several types of bearings: 41 percent of ball bearings under 30 mm outer diameter (O.D.), 26 percent of cylindrical roller bearings, 22 percent of ball bearings over 100 mm O.D., and 16 percent of ball bearings between 30 mm and 100 mm O.D. Too few companies reported thrust bearing shipments to provide information in that category, and none of the respondents reported shipments of ball bearings with integral shafts or shipments of retainers. We consolidated the bearing components data to avoid disclosure of individual company data.

Tables A-3 and A-4 are similar to Tables A-1 and A-2; they show defense and nondefense bearing shipments in units instead of dollars. Compared with shipments in dollars, DoD's percentage of shipments in units is much lower, with an average of 0.5 percent. Only for ball bearings under 30 mm O.D., tapered roller bearings, and thrust bearings are dollar and unit percentages comparable. Dollar and unit percentages differ because of DoD purchases more higher priced bearings as a percentage of its total bearing purchases than does industry in general. The higher prices result from tighter tolerances; special materials, packaging, and lubrication; and other unique DoD requirements. These tables also help explain why DoD is having difficulty obtaining some Annular Bearing Engineers Committee (ABEC) 1 bearings domestically. Inexpensive foreign commodity bearings have captured a large share of the commercial market, and DoD does not buy enough of those bearings to keep domestic manufacturers in production.

As a group, the eight bearing firms had a modest net gain of 96.5 million units of domestic manufacturing capacity since October 1987. By including foreign production facilities, the eight firms reported a net gain in manufacturing capacity of 1.6 billion units. The capacity figures can be somewhat misleading since they include balls and rollers, many of which are produced for each complete assembly produced.

BOTTLENECKS, LEAD TIMES, AND CAPITAL INVESTMENT

The respondents rated the severity of bottlenecks that might occur during surge production at their manufacturing facilities on a scale of 1 to 5, with 1 being the most severe. Seven manufacturing operations were rated. Table A-5 lists each operation in order of bottleneck severity and the average for that operation.

Specific bottlenecks mentioned for the boring, grinding, and turning operation include track, centerless, and bore grinding; turning equipment and skills; and general labor, equipment, and setup skills. For the heat-treating operation, bottlenecks include hardening, furnace capacity, carburizing and vacuum heat treating, and equipment. Parts/components bottlenecks include raw material, stainless steel wires, cages, setup skills, and finishing skills.

The remaining four operations are not expected to cause severe bottlenecks during surge production. Superfinishing was mentioned as a bottleneck for polishing/lapping. Equipment deficiencies were seen as causing bottlenecks for the last three operations, and labor deficiencies would cause bottlenecks in calibration

TABLE A-1

TABLE A-1

VALUE OF DEFENSE BEARING SHIPMENTS

Product	1988		1989		1990	
	$ millions	Percent of total	$ millions	Percent of total	$ millions	Perce of to
Ball bearings						
Radial						
Up to 30 mm O.D.	39.7	41.1	42	40.4	41	40.
30 to 100 mm O.D.	65.4	17.0	72.3	15.8	69.3	15.
Over 100 mm O.D.	40.8	24.3	43.2	21.0	46.3	21.
With integral shafts	0	0.0	0	0.0	0	0.
Thrust	a	a	a	a	a	a
Other	10.9	13.9	8.6	10.1	8.4	9.
Roller bearings						
Tapered	a	a	a	a	a	a
Spherical	13.5	7.8	17.4	8.1	15.1	6.
Cylindrical	52.5	30.0	47.8	25.0	41.9	22.
Needle	a	a	a	a	a	a
Other	a	a	a	a	a	a
Bearing components	0.8	1.0	1.0	1.1	1.1	1.3
Total	248.1	10.7	256.2	10.0	249.3	9.8

[a] Withheld to avoid disclosure of individual company data

TABLE A-1

F DEFENSE BEARING SHIPMENTS

Percen of tota	ercent f total	1990		First quarter 1991		Total	
		$ millions	Percent of total	$ millions	Percent of total	$ millions	Percent of total
40.4	40.4	41	40.4	9.3	39.6	132	40.6
15.1	15.8	69.3	15.1	18.6	17.9	225.6	16.0
21.7	21.0	46.3	21.7	11.7	21.4	142	22.1
0.0	0.0	0	0.0	0	0.0	0	0.0
a	a	a	a	a	a	a	a
9.8	10 1	8.4	9.8	2.2	8.6	30	11.0
a	a	a	a	a	a	a	a
6.6	8 1	15.1	6.6	3.2	5.8	49.1	7.3
22.3	25 0	41.9	22.3	10.7	24.2	152.9	25.6
a	a	a	a	a	a	a	a
a	a	a	a	a	a	a	a
1.3	1 1	1.1	1.3	0.4	2.2	3.3	1.2
9.8	10 0	249.3	9.8	63.8	11.0	817.5	10.2

TABLE A-2

TABLE A-2

VALUE OF NONDEFENSE BEARING SHIPMENTS

($ millions)

Product	1988	1989	1990	First quarter 1991
Ball bearings				
Radial				
Up to 30 mm O.D.	56.8	61.9	60.6	14.2
30 to 100 mm O.D.	319.9	386.8	388.4	85.1
Over 100 mm O.D.	127.3	162.5	166.9	42.8
With integral shafts	39.7	65.4	48.7	13.1
Thrust	a	a	a	a
Other	67.4	76.4	76.8	22.9
Roller bearings				
Tapered	a	a	a	a
Spherical	158.9	197.0	212.4	52.1
Cylindrical	122.5	143.3	145.6	33.6
Needle	a	a	a	a
Other	a	a	a	a
Bearing components	82.4	85.1	81.7	18.2
Total	2,077.4	2,317.1	2,305.8	516.6

[a] Withheld to avoid disclosure of individual company data

TABLE A-2

NONDEFENSE BEARING SHIPMENTS

($ millions)

1989	1990	First quarter 1991	Total
61.9	60.6	14.2	193.5
386.8	388.4	85.1	1,180.3
162.5	166.9	42.8	499.5
65.4	48.7	13.1	166.9
a	a	a	a
76.4	76.8	22.9	243.6
a	a	a	a
197.0	212.4	52.1	620.5
143.3	145.6	33.6	445.0
a	a	a	a
a	a	a	a
85.1	81.7	18.2	267.4
2,317.1	2,305.8	516.6	7,217.0

TABLE A-3

TABLE A-3

QUANTITY OF DEFENSE BEARING SHIPMEN

Product	1988		1989		1990	
	Quantity (000)	Percent of total	Quantity (000)	Percent of total	Quantity (000)	P
Ball bearings						
Radial						
Up to 30 mm O.D.	7,599.0	38.1	6,908.0	38.8	6,274.0	
30 to 100 mm O.D.	1,865.0	2.2	1,878.0	2.7	1,933.0	
Over 100 mm O.D.	138.0	2.8	125.0	1.6	125.0	
With integral shafts	0	0	0	0	0	
Thrust	a	a	a	a	a	
Other	431.2	9.4	367.4	8.2	294.9	
Roller bearings						
Tapered	a	a	a	a	a	
Spherical	94.3	4.0	98.2	3.9	95.1	
Cylindrical	164 0	3.0	139.0	2.5	119.5	
Needle	a	a	a	a	a	
Other	a	a	a	a	a	
Bearing components	5,255 0	0.2	5,932.0	0.2	5,711.0	
Total	18,247 6	0.5	18,241.6	0.5	17,417.5	

[a] Withheld to avoid disclosure of individual company data

TABLE A-3

' OF DEFENSE BEARING SHIPMENTS

'MEN

	1990		First quarter 1991		Total	
1990 of total P(	Quantity (000)	Percent of total	Quantity (000)	Percent of total	Quantity (000)	Percent of total
8	6,274.0	40.9	1,450.0	42.2	22,231.0	39.3
7	1,933.0	3.0	603.0	4.2	6,279.0	2.7
6	125.0	3.5	39.0	4.2	427.0	2.5
	0	0	0	0	0	0
	a	a	a	a	a	a
2	294.9	7.7	63.4	2.5	1,156.9	7.5
	a	a	a	a	a	a
9	95.1	3.3	23.2	2 9	310.7	3.6
5	119.5	2.9	33.1	2.8	456.2	2.8
	a	a	a	a	a	a
	a	a	a	a	a	a
2	5,711.0	0.2	1,267.0	0.2	18,165.0	0.2
5	17,417.5	0.5	4,330.0	0.6	58,236 7	0.5

TABLE A-4

TABLE A-4

QUANTITY OF NONDEFENSE BEARING SHIPMENTS

(000 units)

Product	1988	1989	1990	First quarter 1991	
Ball bearings					
Radial					
Up to 30 mm O.D.	12,346.0	10,899.0	9,061.0	1,986.0	
30 to 100 mm O.D.	81,118.1	67,485.4	62,204.2	13,676.3	
Over 100 mm O.D.	4,740.0	7,839.1	3,471.2	885.0	
With integral shafts	20,719.0	21,592.0	21,657.0	4,778.0	
Thrust	a	a	a	a	
Other	4,156.8	4,087.6	3,541.1	2,462.6	
Roller bearings					
Tapered	a	a	a	a	
Spherical	2,292.5	2,439.8	2,799.8	772.0	
Cylindrical	5,254.9	5,373.5	4,009.6	1,165.7	
Needle	a	a	a	a	
Other	a	a	a	a	
Bearing components	2,815,623.0	3,207,373.0	3,073,355.0	654,795.0	9,7
Total	3,438,426.0	3,827,745.7	3,619,355.8	770,654.7	11,2

[a] Withheld to avoid disclosure of individual company data

.E A-4

NSE BEARING SHIPMENTS

units)

	1990	First quarter 1991	Total
	9,061.0	1,986.0	34,292.0
	62,204.2	13,676.3	224,484.0
	3,471.2	885.0	16,935.3
	21,657.0	4,778.0	68,746.0
	a	a	a
	3,541.1	2,462.6	14,248.1
	a	a	a
	2,799.8	772.0	8,304.1
	4,009.6	1,165.7	15,803.7
	a	a	a
	a	a	a
9,7	3,073,355.0	654,795 0	9,751,146.0
11,2	3,619,355.8	770,654.7	11,297,331.8

TABLE A-5

BOTTLENECKS

Operation	Severity average
Boring, grinding, and turning	2.4
Heat treating	3.3
Parts/components	3.4
Polishing/lapping	4.5
Calibration and inspection	4.6
Assembly	4.6
Testing	4.8

and inspection and in assembly. Gauges were also seen as a trouble area in calibration and inspection and in testing.

One firm mentioned that predicting bottlenecks for a production surge is difficult because of the assumption that the current product mix would be maintained. In reality, a firm could be more flexible; for example, by adding additional shifts, altering the DoD-commercial product mix, purchasing production equipment, or subcontracting.

The survey data show that delivery time for domestically produced bearings in 1990 averaged 18.9 weeks for commercial orders and 28.7 weeks for defense orders. The longest lead time reported for a product was 18 months. The most frequently cited reasons for long lead times were the availability of material, special manufacturing requirements, and complexity. Other factors mentioned include forgings, M50 steel, special torque requirements, erratic yields, and higher demand. One firm added that DoD's material certification and traceability requirements discourages them from stocking components and semifinished work-in-process, thereby increasing lead time.

Table A-6 shows the capital investments made by the eight firms from 1986 to 1990. Total investments have increased nearly 150 percent since 1986, which was a low point in industry profitability. Most investment, 70.7 percent, went into new equipment. Over the next 2 years, the eight firms have planned $312 million in

capital investments. As in previous years, much of this will be dedicated to equipment improvements.

TABLE A-6

BEARING INDUSTRY CAPITAL INVESTMENTS, 1986 THROUGH 1990

($ millions)

Investment category	1986	1987	1988	1989	1990	Total	Percentage
Plant	15.2	11.6	18.9	18.8	41.2	105.7	14.0
Equipment	65.9	73.2	94.4	145.4	155.5	534.4	70 7
Other	10.9	17.9	28.2	27.2	31.6	115 8	15.3
Total	92.0	102.6	141 5	191.4	228.3	755.8	—

LABOR REQUIREMENTS

The eight firms were evenly split over whether they had difficulty hiring workers with critical skills. The skills found to be in short supply were grinder operators, screw machine operators, industrial skills, engineering and metallurgical engineering, electrical and electronics skills, maintenance, communications skills, problem-solving abilities, computer numerically controlled operations, and assembly skills.

RESEARCH AND DEVELOPMENT AND TECHNOLOGY

The percentage of sales that the surveyed firms devote to R&D ranges from 0.003 percent to 3.7 percent, with a median of 1.3 percent. The average distribution of R&D funding between product-related and process-related projects is 44.1 percent to 51.9 percent, respectively, with the remaining 4 percent to other projects. The individual firms, however, tend to select either process- or product-related projects and devote substantially more funding to the category selected. Three firms favored product-related R&D projects, while four favored process-related projects.

Since 1988, all eight bearing firms have conducted R&D in computer-assisted design and computer-assisted manufacturing (CAD/CAM) and in numerically controlled grinding. Nearly all of the firms have also conducted R&D in single-point turning, hard turning, and noncontact gauging. Four manufacturers conducted R&D

in induction heat treating. Two of eight firms conducted R&D in high-speed press forming, ceramics, and/or honing. A number of technologies received R&D support from single firms. These technologies include computer-assisted engineering (CAE), expert systems, nondestructive evaluation (NDE) inspection, metrology, bearing and steel performance, ball track grinding, Environmental Protection Agency compliance, superfinishing, synchronous manufacturing, and forging.

In order to maintain or improve their competitive position, five firms indicated that they will need to invest in grinding technology. Four firms mentioned ceramics, and three mentioned superfinishing or microfinishing. Technology areas mentioned by two or fewer companies include automation, facilities, state-of-the-art equipment, ion deposition, M50 NiL processing, hard turning, NDE, CAE, fine blanking, coatings, product integration, corrosion-resistant elements, flexible manufacturing, and assembly.

TRADE IMPACTS

The bearing manufacturers were asked to indicate the effects that the DoD bearing purchase restriction and the antidumping tariffs imposed on foreign suppliers had on their businesses. The respondents generally reported favorable outcomes from the DoD restriction. One firm reported a 5 percent increase in sales, another a 10 to 15 percent increase, and a third firm believed that the restriction prevented displacement of 50 percent of its products. Other firms stated that the restriction allowed more profitable pricing of bearings, and business increased or was regained from DoD contractors. One firm commented that the United States should actively promote and manage a lengthy extension of the restriction. Another firm said that the restriction should be continued to maintain the industrial base, as well as production and engineering skills. That firm also felt that trade agreements and treaties that provide a fair and level playing field were needed.

Several firms believed that the restriction was not administered effectively by DoD, thus reducing its effectiveness. One firm stated that 3 years was an insufficient period for the restriction to have its desired impact. A few firms were less enthusiastic about the results, reporting only slight increases in sales, and noting that the market remains very competitive with or without the restriction. Two firms noted that the restriction encouraged foreign manufacturing to transfer production to the United States or to purchase U.S. manufacturers. Encouraging foreign

production to transfer to the United States, while beneficial for DoD, was seen as a threat by domestic manufacturers.

A number of positive comments were also made regarding the effect of the antidumping duties imposed on foreign suppliers. One manufacturer reported that the duties stabilized bearing prices and allowed for some price increases. Another firm said that the duties restored pricing levels, improving profitability and allowing an increase in R&D investment. One comment was that the duties allowed ABEC 5 and 7 bearing prices to rise but not ABEC 1 and 3 prices. One firm noted that the duties reduced participation by offshore competitors, but the market still remained flat. Another firm said that they substantially increased their investment in U.S. capacity for industrial business.

There were a few negative comments about the antidumping duties. Two firms said that the duties had little or no effect on their business. One firm lost business in areas in which it had no U.S. capacity. Another firm, having become less competitive on its imported bearings, stated it would expand U.S. production. One firm felt that the duties were inadequate because of a "no harm" determination by the Department of Commerce. Another comment was that foreign firms could still threaten the domestic market by transferring production to countries not covered by the antidumping duties.

COMPETITIVENESS

The eight firms were asked what actions they have taken in recent years to increase productivity. A second question asked for their views on the competitive prospects for their firm's U.S. bearing operations over the next 5 years. The most frequently mentioned action taken to increase competitiveness was increased investment in plant and equipment reported by seven of the eight firms. Beyond that, the respondents mentioned a wide variety of actions designed to improve competitiveness, including total quality management; increased productivity and quality; increased markets and exports; increased employee training, productivity, and participation; reorganized manufacturing processes; reduced profit margins; "just-in-time" operations; statistical process control; heavy R&D investment; improved delivery reliability; mergers and joint ventures; and maintaining a quality technical and sales staff.

The bearing manufacturers had a mixed view of the prospects for their firms in the coming 5 years. Several saw improving prospects because of increased competitiveness of existing product lines, adding new products and markets, heavy capital investment in U.S. capacity, and benefits from the antidumping duties.

Several other firms were less optimistic. One expected to remain competitive in an extremely competitive market. Another saw good prospects if new products and markets are successful and if the U.S. Government continues to support fair trade policies. However, that firm also said prospects would be poor if nontariff barriers to U.S. products continue, bearing manufacturers continue to consolidate into a few big companies, and DoD budgets decline. A third firm saw improved prospects because of capital improvements and product expansion. That firm was concerned that low-cost imports would continue to suppress profitability and would limit the firm's ability to complete capital improvements. The firm favored continuation of the DoD restriction.

Two firms had a pessimistic outlook. One expected a decline because of intense competition, excess capacity, the emerging free economies of Eastern Europe and the Soviet Union, increased investment in the United States by foreign bearing manufacturers, and Government policy that favors foreign competition. A second firm also predicted increased competition from Europe and the Far East, and from multinational firms purchasing U.S. manufacturers. That firm also noted that customers in industries with declining profit margins increase the pressure to lower prices.

BEARING INDUSTRY QUESTIONNAIRE

DEFINITIONS

Bearing

Consists of a minimum of all of the following: inner race, outer race, and associated rolling elements.

Bottleneck

During a production expansion, the production process, operation, or procedure, or labor requirement within your manufacturing establishment that would ultimately delay or prevent increased production.

Defense shipments

Direct and indirect military shipments (FOB Point of Shipment), including weapon systems, support equipment, and all other defense related end-use items, identified by purchase orders bearing a DO or DX rating and/or a contract number from the Department of Defense, NRC, CIA, FAA, or NASA, as well as the orders of your customers whom you could identify as producing products for defense purposes, and items tested and certified to military specifications.

Establishment

Facility(ies) at a single location where manufacturing or production takes place. Includes auxiliary facilities operated in conjunction with such production facilities (whether or not in the same building).

Firm

An individual proprietorship, partnership, joint-venture, association, corporation (including any subsidiary corporation in which more than 50 percent of the outstanding stock is owned), business trust, cooperative, trustee in bankruptcy, or receivers under decree of any court, owning or controlling one or more establishments as defined above.

Foreign source

A source located outside of the United States from which you purchase a bearing or bearing component, or assembly.

Lead time

The time interval, expressed in weeks, between the placement of an order for a bearing or bearing component, and its delivery to the end-user.

"Other" bearings

All complete ground bearings with precision ratings of less than ABEC or RBEC 5 (or equivalent).

Superprecision bearings

Complete bearings with ABEC or RBEC ratings of 5 and above (or equivalent).

PART I. FIRM IDENTIFICATION

(To be filled out for entire firm)

1. Name and address of your firm or corporate division.

_____

_____

_____

2. If your firm is wholly or partly owned by another firm, indicate the name and address of the parent firm and the extent and nature of ownership.

_____

_____

_____

Percentage ownership: _____%

3. Identify the location of your bearing manufacturing establishment(s) in the United States. Indicate the type of finished bearings and bearing components produced by listing the corresponding bearing categories provided in the appendix.

	Locality	State	Zip	Products manufactured
(a)	_____	_____	_____	_____
(b)	_____	_____	_____	_____
(c)	_____	_____	_____	_____
(d)	_____	_____	_____	_____
(e)	_____	_____	_____	_____
(f)	_____	_____	_____	_____
(g)	_____	_____	_____	_____

PART II. PRODUCTION AND CAPACITY

1. Identify product lines in which you ceased bearing production in the United States or Canada since October 1, 1987 and the reason production was stopped (use letter codes provided below).

   Reasons: a. Loss of market share to imports.
   b. Loss of market share to domestic competition.
   c. Declining demand.
   d. Low profitability.
   e. Firm restructuring.
   f. Other (Specify: _____).

Date	Location (city/state)	Bearings/components (categories from appendix)	Reasons (codes)	Annual capacity lost in units (000s)

2. Have you closed any plants from October 1987 to the present? If so, explain what product lines were lost and what volume of productive capacity (by bearing/part listed in the Appendix) was lost. (Annual productive capacity is defined as the maximum annual output of a plant assuming all labor and material requirements are fully met and equipment is operated at the maximum rate given technological constraints.) If you have any explanatory comments, please provide them following Question 3.

Date	Location (city/state)	Bearings/components	Annual capacity lost in units (000s)

(continued)

3. Have you added any capacity since October 1987? If so, explain what products are being produced and how much productive capacity was added. Include both domestic and foreign additions to capacity. Please provide any explanatory comments below.

Date*	Location (city/state/country)	Bearings/components	Annual capacity gained in units (000s)

*Date at which plant was fully operable

Comments: _____

4. The following two tables request information relating to your firm's shipments of antifriction bearings and components from 1988 through the first quarter of 1991. Please refer to product codes and definitions provided in the attached appendix in identifying product types.

(over)

FIRM SHIPMENTS

(Units, thousands)

Product category	Defense				Non-Defense			
	1988	1989	1990	First quarter of 1991	1988	1989	1990	First quarter of 1991
Ball bearings								
Radial:								
Up to 30 mm O.D.								
30 to 100 mm O.D.								
Over 100 mm O.D.								
With integral shafts								
Thrust bearings								
Other bearings, including mounted								
Roller bearings								
Tapered, including cups and cones								
Spherical								
Cylindrical								
Needle bearings								
Other roller bearings, including mounted								
Bearing components								
Rings								
Retainers								
Balls								
Rollers								

FIRM SHIPMENTS

(Dollars, thousands)

Product category	Defense				Non-Defense			
	1988	1989	1990	First quarter of 1991	1988	1989	1990	First quarter of 1991
Ball bearings								
Radial:								
Up to 30 mm O.D.								
30 to 100 mm O.D.								
Over 100 mm O.D.								
With integral shafts								
Thrust bearings								
Other bearings, including mounted								
Roller bearings								
Tapered, including cups and cones								
Spherical								
Cylindrical								
Needle bearings								
Other roller bearings, including mounted								
Bearing components								
Rings								
Retainers								
Balls								
Rollers								

PART III. BOTTLENECKS, LEAD TIMES, AND CAPITAL INVESTMENT

1. Production bottlenecks

(To be filled out for each establishment,
please make as many copies as necessary)

In which of the following areas would you encounter bottlenecks in this facility if you were asked to surge production to meet national security needs? Refer to the definition provided of bottlenecks. Rank entries in order of severity (1 = most severe to 5 = least severe).

Establishment Name: _____

Operation	Rank	Bottlenecks
Boring, grinding, and turning	_____	_____
Heat treating	_____	_____
Polishing/lapping	_____	_____
Calibration and inspection	_____	_____
Assembly	_____	_____
Testing	_____	_____
Parts/components	_____	_____
Other (specify)	_____	_____

(continued)

2. Lead times

A. What was the average lead time (i.e., from receipt of order to delivery to customer) for domestically produced bearings in 1990?

Non-Defense orders _____ weeks Defense orders _____ weeks

B. Regarding the longest lead time for Defense items, list the type of bearing, the precision rating (ABEC/RBEC), the defense system supported, the average lead time during 1990, and the cause of the long lead time. Provide at least three examples.

Bearing size, type, and rating	Defense system supported*	Average lead time (months	Cause of long lead time

*Weapon systems, support vehicles, and other items purchased by the Department of Defense for battlefield applications.

(continued)

3. Capital investment

A. What capital investments have you made for bearing manufacture in the past 5 years?

CAPITAL INVESTMENT

(Dollars, thousands)

	1986	1987	1988	1989	1990
Plant					
Equipment					
Other					

B. What capital investments have you planned for the next 2 years? Please provide a brief description of the project, when it will be started, and an estimate of the dollars required.

Project description	Year begun	Dollars, thousands

PART IV. LABOR REQUIREMENTS

1. Have you had difficulty hiring workers with critical skills?

   Yes____ No____

   If so, what skills are in short supply?

   _____

   _____

   _____

PART V. RESEARCH AND DEVELOPMENT AND TECHNOLOGY

(To be filled out for entire firm)

1. Research and development

A. On average between 1988 and 1990, what percentage of sales was earmarked for research and development?

_____% of sales earmarked for R&D.

B. Please check the areas of technology in which you have conducted R&D during the period 1988 to the present. Add any others not covered by the following list:

CAD/CAM	_____
High-speed press forming	_____
Single-point turning	_____
Hard turning	_____
Induction heat treating	_____
NC grinding	_____
Noncontact gauging	_____
Other*	_____

*(Specify: _____)

C. Give a rough breakdown of the distribution of your R&D dollars among product-oriented projects, process-oriented projects, and other.

R&D	Percentage
Product	_____
Process	_____
Other	_____

D. What new technologies will you need to invest in to maintain or improve your competitive position?

_____

_____

_____

PART VI. TRADE IMPACTS

(To be filled out for entire firm)

1. What effect has the DoD restriction had on your DoD business (costs, markets, efficiency, capacity, and employment)? Please specify both positive and negative effects.

2. What effect have the antidumping tariffs imposed on foreign suppliers had on your business?

PART VII. COMPETITIVENESS

(To be filled out for entire firm)

1. What actions have you taken in recent years to increase your competitiveness?

2. How do you view the competitive prospects for your firm's U.S. bearing operations over the next 5 years? (improve or decline) Explain.

Comments: Please use the space below to provide any additional comments or information you may wish regarding your operations, or other related issues that have an impact on your firm.

Please sign this questionnaire and provide a point of contact to answer questions about your response.

(Date) (Signature)

(Area code and number) (Type or print name and title above)

(Area code and number) (Person to contact regarding this questionnaire)

BEARING CLASSIFICATIONS

Note: Superprecision bearings are noted with "*".

1. RADIAL BALL BEARINGS:

Anti-friction bearings using balls as rolling elements, ground or precision, including single row, double row, split ring, and self-aligning.

SIC Product Codes	TSUSA	Schedule B
A. Up to 30 mm:		
*35621-02, *35621-09	*680.3704	*680.3581
35621-01, 35621-03	*680.3708	*680.3582
B. 30 – 100 mm:		
*35621-11, *35621-12	*680.3712	*680.3583
35621-04, 35621-05	*680.3717	*680.3584
C. Over 100 mm:		
*35621-13	*680.3718	*680.3585
35621-07		

2. BALL BEARINGS WITH INTEGRAL SHAFTS:

35621-15	680.3300	680.3300
35621-17		(680.3400)

3. THRUST BALL BEARINGS:

35621-33	Included in 680.3586	Included in 680.3722

4. ALL OTHER BALL BEARINGS:

Includes all other anti-friction bearing types not listed above, including all mounted ball bearings, angular contact ball bearings, double and single row maximum capacity type, and all other ground or precision bearings. TSUSA codes for mounted bearings (those with suffix 681) combine roller and ball bearing types.

35621-14	680.3722	680.3586
35621-16	(680.3820)	680.3710
35621-18		
35621-21	681.0410	
35621-51	681.0430	
	681.0700	
35624-17	681.1010	
	681.1030	
	681.1300	

5. ROLLER BEARINGS:

An anti-friction bearing using rolling elements. Tapered, spherical, and needle include thrust type.

SIC Product Codes	TSUSA	Schedule B
A. Tapered Roller Bearings:		
35622-32	680.3932	680.3593
35622-33	680.3934	
35622-34	680.3938	
	680.3940	
	(680.4140)	
	(680.4144)	
	(680.4152)	
	(680.4148)	
B. Spherical Roller Bearings:		
Includes hourglass and barrel, single and double row.		
35623-24	680.3952	680.3696
35622-25	680.3596	680.3597
C. Cylindrical Roller Bearings:		
35623-11	Included in	Included in
35623-12	680.3960	680.3598
D. Needle Roller Bearings:		
35629-41	Included in	Included in
	680.3960	680.3598
E. All Other Roller Bearings:		
Includes mounted roller bearings, cylindrical radial roller bearings other than needle (including inner ring separable, outer ring separable, snap ring retainment, journal roller bearings, elliptical roller bearings, and aircraft control and pulley bearings).		
35623-11	680.3960	680.3598
35623-12	(680.4170)	680.3720
35624-53	681.0410	
35624-55	681.0430	
	681.0700	
35622-35	681.1010	
	681.1030	
	681.1300	

6. BEARING COMPONENTS:

SIC Product Codes	TSUSA	Schedule B
A. Balls:		
35629-11	680.3025	680.3026 680.3030
B. Rollers:		
35629-31	680.3040	680.3040 (680.3100)
C. Retainers and rings:		
35629-21	680.3727	680.3588
35629-41	680.3728 680.3830	680.3730

APPENDIX B

BEARING INDUSTRY DATA

Table B-1

Table B-2

Table B-3

TABLE B-1

INDUSTRY TRENDS, 1980 THROUGH 1990

Category	1980	1981	1982	1983	1984	1985
Millions of current dollars						
Shipments	$3,261.7	$3,582.6	$2,891.2	$2,956.0	$3,534.9	$3,508.9
Imports	487.5	484.6	460.1	423.3	627.6	638.5
Exports	368.5	381.9	310.3	253.1	330.6	304.8
Change in inventories	68.0	40.9	35.7	– 84.1	128.2	– 48.7
Apparent consumption	3,448.7	3,726.2	3,076.7	3,042.1	3,960.1	3,793.9
Import penetration (%)	14.1%	13.0%	15.0%	13.9%	15.8%	16.8%
Millions of constant dollars						
Shipments	$3,972.8	$4,016.4	$3,021.1	$2,956.0	$3,462.2	$3,380.4
Imports	593.8	543.3	480.8	423.3	614.7	615.1
Exports	448.8	428.1	324.2	253.1	323.8	293.6
Change in inventories	82.8	45.9	37.3	– 84.1	125.6	– 46 9
Apparent consumption	4,200.6	4,177.4	3,214.9	3,042.1	3,878.6	3,655.0
Import penetration (%)	14.1%	13.0%	15.0%	13.9%	15.8%	16.8%

Source: Department of Commerce, Bureau of the Census (Standard Industrial Classification basis)

Note: n/a = not available

TABLE B-1

)0 RY TRENDS, 1980 THROUGH 1990

	1984	1985	1986	1987	1988	1989	1990
9	$3,534.9	$3,508.9	$3,349.3	$3,550.9	$3,899.2	$4,067.1	$4,210.0
5	627.6	638.5	666.8	710.3	905.7	989.4	912.8
8	330.6	304.8	282.9	358.8	393.8	478.9	707.3
7	128.2	– 48.7	– 15.8	– 12.4	83.1	n/a	n/a
9	3,960.1	3,793.9	3,717.4	3,910.0	4,494.2	4,577.6	4,415.5
	15.8%	16.8%	17.9%	18.2%	20.2%	21.6%	20.7%
1	$3,462.2	$3,380.4	$3,195.9	$3,362.6	$3,603.7	$3,717.6	$3,796.2
	614.7	615.1	636.3	672.6	837.1	904.4	823.1
	323.8	293.6	269.9	320.8	364.0	437.8	637.8
	125.6	– 46.9	– 15.1	– 11.7	76.8	n/a	n/a
	3,878.6	3,655.0	3,547.1	3,702.7	4,153.6	4,184 3	3,981.5
	15 8%	16 8%	17.9%	18.2%	20.2%	21.6%	20.7%

TABLE B-2

LABOR FORCE PARTICIPATION AND EARNINGS, 1980 THROUGH

Workers/wages	1980	1981	1982	1983	1984	1985	1986
Production workers (000)							
Bearings	42.3	42.4	33.6	29.9	34.0	31.1	30.3
All manufacturing	13,900.1	13,542.8	12,400.6	12,194.9	12,572.8	12,174.4	11,765.4
Average hourly wages, constant dollars 1982 – 1984 = 100							
Bearings	9.58	9.52	9.24	9.40	9.57	9.59	9.82
All manufacturing	8.82	8.79	8.80	8.87	8.85	8.87	8.88

Source: Department of Labor, Bureau of Labor Statistics

TABLE B-2

IPATION AND EARNINGS, 1980 THROUGH 1990

1984	1985	1986	1987	1988	1989	1990	Average annual percentage change
34.0	31.1	30.3	29.2	31.4	32.5	32.0	– 2.8
12 572.8	12,174.4	11,765.4	12,259.5	13,221.0	13,257.0	12,936.0	– 1.0
9.57	9.59	9.82	9.62	9.35	9.23	9.17	– 0.4
8.85	8.87	8.88	8.72	8.61	8.46	8.29	– 0.6

TABLE B-3

SOURCES OF IMPORTED BEARINGS, 1980 THROUGH 199(

(Millions of current dollars)

Country	1980	1981	1982	1983	1984	1985	1986
Japan	$169.2	$195.3	$183.7	$172.7	$267.9	$299.3	$290.
Federal Republic of Germany	93.8	89.2	86.4	74.3	100.0	95.2	114.
Canada	36.8	47.4	44.1	51.5	61.7	58.2	56.
Singapore	18.7	15.3	26.1	25.2	5.6	35.0	10.
Italy	14.1	22.6	16.3	17.3	25.3	24.2	35.
United Kingdom	26.2	35.8	21.3	17.1	23.9	24.0	27.
France	12.0	14.8	7.8	20.6	27.1	23.8	25.
China (Taiwan)	6.2	3.5	1.2	1.3	2.6	4.0	5.
Sweden	16.6	21.2	11.9	10.5	14.9	13.7	18
China (Mainland)			2.3	1.7	2.2	1.8	1.
Austria	5.2	5.1	6.0	4.1	4.3	4.3	6
Switzerland	6.1	5.2	5.1	5.6	7.3	9.4	8.
Republic of Korea	1.4	1.0	1.7	1.1	1.7	2.8	3.
Mexico					1.6		
Spain					1.6	1.1	1
Brazil	0.6	2.0	2.8	2.7	4.3	4.7	3
Poland	5.4	3.8	3.5				
Thailand						7.8	12.
Hungary			1.2	2.6	2.0	2.7	3
Yugoslavia				1.7	1.1	2.0	1
Turkey							0.
Rumania	11.4	14.2	17.9	14.3	11.7	18.9	10.
Hong Kong							1.
All others	7.3	4.7	23.4	3.7	61.5	7.6	23
Total imports	$431.0	$481.1	$462.7	$428.0	$628.3	$640.5	$661.

Source: Department of Commerce, Bureau of the Census (TSUSA basis)

TABLE B-3

1 1990 PORTED BEARINGS, 1980 THROUGH 1990

(Millions of current dollars)

1986	1984	1985	1986	1987	1988	1989	1990	Average annual percentage change
$290.	$267.9	$299.3	$290.3	$300.8	$388.1	$408.1	$348.0	7.5
114.	100.0	95.2	114.6	134.7	172.3	149.6	157.1	5.3
56.	61.7	58.2	56.8	58.0	78.7	80.9	71.0	6.8
10	5.6	35.0	10.1	31.5	26.0	48.5	64.1	13.1
35.	25.3	24.2	35.6	33.0	53.7	48.4	36.2	9.9
27	23.9	24.0	27.1	31.2	47.4	42.3	27.9	0.6
25.	27.1	23.8	25.3	30.1	38.3	35.4	26.0	8.0
5.	2.6	4.0	5.3	5.8	11.2	19.1	23.4	14.2
18	14.9	13.7	18.4	21.1	25.2	18.4	17.8	0.7
1.	2.2	1.8	1.6	3.0	11.1	25.6	17.4	28.8
6.	4.3	4.3	6.6	5.5	8.2	19.0	16.8	12.4
8.	7.3	9 4	8.2	10.3	10.8	6.6	12.1	7.1
3.	1.7	2.8	3.3	2.0	2.6	6.4	10.5	22.3
	1 6			2.1	4.8	9.6	9.0	33.4
1	1 6	1.1	1.3	2.0	2.3	13.9	8.0	30.8
3	4 3	4.7	3.2	4.5	9.8	6.3	7.3	28.4
						3.1	4.5	– 1.8
12		7.8	12.8	14.5	16.3	5 1	3.8	– 13.4
3	2.0	2.7	3.1	2.7	5.2	6.7	3.7	15.1
1	1 1	2.0	1.5	1 5	2.4	2.3	3.1	9.0
0			0.6	1.9	0.8	4.4	3.0	49.5
10.	11 7	18.9	10.6	16.1	20.1	3.9	2.9	– 12.8
1.			1.3	1.6	1.2	2.3	1.8	8.5
23	61 5	7.6	23.7	2.6	23.1	31.4	24.0	
$661.3	$628.3	$640.5	$661.3	$716.5	$959.6	$997.3	$899.4	8.0

APPENDIX C

COMMENTS ON EXTENDING THE DoD RESTRICTION

COMMENTS ON EXTENDING THE DoD RESTRICTION

As part of their evaluation of the current status of the antifriction bearing industry, DoD solicited comments in the *Federal Register*. The following paragraphs summarize the positions expressed in response to that notice.

Several responses were received from manufacturers in favoring extension of the restriction for an additional 2 years. The respondents stated that the restriction had some positive effect and increased their defense business. Despite this fact, they argue that conditions in the industry have not improved since 1988 when the restriction went into effect. One reason for the lack of improvement is that a 3-year restriction does not allow enough time to accommodate the industry restructuring required for U.S. manufacturers to regain their competitive position. These respondents also assert that the time period of relief has been shortened by slow implementation and poor administration of the restriction by DoD.

Manufacturers responding in favor of continuing the restriction also identify several problems with administration of the restriction. A major problem is the interpretation of the commercial item exemption. Some suppliers providing DoD with parts or components that meet the definition of a commercial product interpret the wording of the regulation such that they are exempt from using only domestically manufactured bearings. The respondents in favor of extending the restriction believe that the commercial item exemption should be interpreted very narrowly and that suppliers furnishing DoD with commercial items containing bearings should be required to use domestically manufactured bearings only. The respondents also point out that contracting personnel are not requiring contractors to certify the domestic origin of bearings contained in defense items, as required in the contract clause. Finally, they believe that the waiver authority is not clearly defined and is being used to avoid complying with the restriction.

The respondents recommend that contracting personnel be required to implement the restriction more strictly, including stronger enforcement of the domestic origin certification. They recommend that DoD conduct random audits to trace the origin of the bearings contained in defense end items. When violations are discovered, the respondents want harsher penalties imposed. Finally, these

respondents believe that the restriction needs to be made permanent in order to protect resources necessary to national security.

One industry response opposed continuing the restriction. That respondent based its position on several indications of improving health in the bearing industry: domestic capacity has increased, capital expenditures have increased, profitability has improved, and shipments from domestic manufacturers have increased. It believes the slight decline in shipments predicted for 1991 will be offset by an increase in demand from DoD as it restocks inventory depleted during Operation Desert Storm.

Its comments cite two recent studies that conclude that the superprecision segment, on which DoD relies heavily, is healthy. The Section 232 investigation conducted by the Department of Commerce (DoC) concluded that the superprecision segment would produce a surplus during surge and mobilization.[1] The Air Force Systems Command study of the superprecision segment, found domestic companies had an advantage over foreign producers in material costs and lead times for those materials, and wage rates.[2] The respondent argues that the industry is very segmented and any problems exist only in specific segments. It argues that a blanket restriction for an entire industry is counterproductive, and assistance should be targeted to problem areas only.

Several foreign countries expressed their views against continuing the DoD restriction on antifriction bearings. These countries argue that the rationale for the restriction, that of maintaining the defense industrial base and providing surge and mobilization capability, is questionable given current conditions. They argue that the perceived threat to U.S. national security today is very different than it was in 1988 before dissolution of the Warsaw Pact. They point to additions to U.S. capacity and other signs of improving health in the bearing industry. The respondents argue that the antidumping duties imposed on companies in Europe and Japan provide more protection in the form of increasing domestic prices than the restriction on sales for defense items. They also cite the Section 232 study by DoC that concluded that only 2 out of 15 types of bearings could not meet surge and mobilization targets for a

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[1]*The Effect of Imports of Anti-Friction Bearings on the National Security: An Investigation Under Section 232 of the Trade Expansion Act of 1962, as Amended*, U.S. Department of Commerce, International Trade Administration, July 1988.

[2]*A Comparison of Superprecision Bearing Manufacturing Between Domestic and Foreign Producers*, Thomas J. Topolski, Jr., Air Force Systems Command (HQ AFSC/ENME), February 1990.

major conventional war to show that the national security argument for the bearing industry was not that strong in 1988.

The foreign countries responding also believe the restriction violates memorandums of understanding (MOUs) that the U.S. has negotiated with most of its NATO allies. The MOUs usually call for the parties involved to avoid imposing trade barriers in their domestic defense markets. Some of the respondents believe that restrictions like the one on antifriction bearings have a negative effect on the European mobilization base and the readiness of the other members of NATO. Other respondents noted that Operation Desert Storm proved the benefit of access to foreign suppliers. This group suggests that exempting countries with MOUs from the restriction would mitigate some of the negative impact.

Responses from the procuring activities at DoD discussed problems with administering the restriction and the cost to DoD. They report that, in many cases, prices doubled or tripled after the restriction on a selection of contracts. Also, no new manufacturers entered the defense business, and there was no increase in the range of products offered or in the quality of service provided. The procuring activities support continuing the commercial item exemption since source restrictions are a major impediment to increasing acquisition of commercial items. They also believe that a limit should be placed on the premium paid for using a domestic source and that delivery time should be a factor for granting waivers.

Administrative problems arise from the delegation of waiver authority and the certification requirement for contractors. Many direct purchases are for less than $2,500, and the head of the contracting activity must approve each one because the waiver authority cannot be delegated. Respondents recommend that delegating the authority to a lower level would save a significant amount of administrative time while not eliminating the review process. Respondents also believe it is unnecessary to require the contractor to certify domestic origin on delivery. They assert that the contractor agrees to comply with the restriction when it accepts the clause in the contract.