The Effect of Imports of Nuts, Bolts, and Large Screws on the National Security

Report to the President on an Investigation Conducted Under the Authority of Section 232 of the Trade Expansion Act of 1962, as Amended (19 USC 1862)

February 1983

U.S. DEPARTMENT OF COMMERCE
WASHINGTON, D.C. 20230

UNITED STATES DEPARTMENT OF COMMERCE

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ERRATA

Page 4	fifth paragraph should read: "Projections were made of the available domestic supply of industrial fasteners and the supply of secure imports during a national emergency."
Page 12	third paragraph, third line should read: ". . . 60,000-150,000 pounds per square inch (psi). . . . ."
Page 20	second and third paragraphs, */Source: USITC Publication 924, November 1978, p. A-28.
Page 38	third line on page should read: ". . . Taiwan have also been strong in the U.S. bolt . . . ."
Page 40	second paragraph, fourth line should read: ". . . producers' shipments (weights) rose to 23.2 percent . . . ."
Page 46	eighth line on page should read: ". . . on larger, heavier fasteners (a reaction to imports referred to as . . . ."
Page 47	seventh line on page should read: ". . . provoked by import penetration of nuts). . . ."
Page 49	second line from bottom of page should read: ". . . disaggregated manner . . . ."
Page 51	footnote 3, second and third lines should read: ". . . mobilization requirements is estimated from producers' shipments and final sales of imports). . . . The dollar value was estimated . . . ."
	footnote 6 should read: "The ratio of specials is directly related to the OEM's share (in dollars) of the mobilization requirements. The OEM share of the mobilization requirements is estimated to be: 75.9268 percent in the Mob. Year; 79.2884 percent in Year 1; 80.8928 percent in Year 2; and, 81.5995 percent in Year 3. (See Appendix F, table on "Requirements for Defense and Civilian Production, Based on the Conventional Mobilization Scenario.") Requirements for specials (in pounds) are estimated to be: .3447, .3623, .3707 and .3744 of all requirements in the respective years."

Page 54 — third line on page should read: ". . . and large screws amounted to 1.7 billion pounds in 1980; it was 1.47 . . . ."

first complete paragraph, fourth line should read: ". . . particularly fastener quality steel to producing . . . ."

footnote should be added to bottom of page: */Final Report on Industrial Fastener Study, by New England Research Application Center (NERAC). Submitted to the Department of Commerce, 1982, p. 10.

Page 57 — third line on page should read: ". . . trade objectives. A limit . . . ."

Page 58 — third line on page should read: ". . . national . . . determining the U.S. national . . . ."

Page 59 — table on "Mobilization Requirements," third column, "Domestic Capacity, War Year 3," should read "1,778,600"

Page 61 — second paragraph from bottom of page, fourth line should read: "1982. (See Table 2 in Appendix)"

Page 62 — last paragraph, first line should read: "Only 20 percent of the standards (based on pieces) used in the U.S. are . . . ."

Page 63 — third paragraph, seventh line: ". . . only the defense . . . but would not be able . . . ."

Appendix J — Reference 4: "ITC-203-11 (1981) #1193"

Add: "ITC-201-2 (1975) #747"

Executive Summary

The Department of Commerce initiated this investigation to determine the effect on the national security of imports of nuts, bolts and large screws of iron or steel (excluding mine roof bolts, but including lag screws and bolts) under the authority of Section 232 of the Trade Expansion Act of 1962, as amended (19 USC 1862), as the result of a February 11, 1982, request from the Secretary of Defense.

After assessing relevant data as required by the statute, we have concluded that the nuts, bolts and large screws of iron or steel investigated here are not being imported into the U.S. in such quantities or under such circumstances as to threaten to impair our national security. During a mobilization imports of fasteners would be reliable, would comprise an important part of our required supply of industrial fasteners and would augment our domestic production. The decline in productive capacity in the U.S. industrial fastener industry consequently, does not pose a threat to our national security. The industry's difficulties are due not only to import penetration, but also to general economic conditions, and the general economic recovery can be expected to help the industry significantly.

This investigation concerned imports of the following industrial fastener categories as defined by the Tariff Schedules of the United States (TSUS):

Item No.	
646.4920	Lag screws or bolts (of iron or steel)
646.5400	Bolts and bolts and their nuts imported in the same shipment (of iron or steel)
646.5600	Nuts (of iron or steel)
646.6320	Cap screws (of iron or steel) having shanks or threads over 0.24 inch in diameter
646.6340	Other screws with shanks or threads over 0.24 inch in diameter (of iron or steel)

Nuts, bolts and large screws of iron or steel, commonly called industrial fasteners, are mechanical devices designed specifically to hold, join, couple or assemble multiple components. Most U.S. industries require such fasteners. Leading users of nuts, bolts and large screws include the automobile, construction, industrial equipment and home applicance industries.

The Department of Commerce regulations governing Section 232 mandate certain criteria for determining the effects of imports on the national security including:

1) requirements of the direct defense, indirect defense and civilian sectors of the national economy;

2) domestic production needed for projected national defense needs;

3) capacity of domestic industries to meet projected national defense needs;

4) existing and anticipated availability of labor (skilled and unskilled), raw materials, production equipment and facilities, and other supplies and services essential to the national defense;

5) growth requirements of domestic industries to meet national defense requirements;

6) quantity, quality and availability of imports;

7) impact of foreign competition on the economic welfare of any essential domestic industry;

8) serious effects of imports on the possible displacement of domestic products, unemployment, decrease in revenues to the government, loss of investments, loss of specialized skills and loss of productive capacity;

9) any other relevant factors that may weaken the national economy; and

10) other factors relevant to the national security in light of any unique circumstances associated with each case.

In order to determine if imports of nuts, bolts, and large screws of iron or steel are threatening the national security, the investigation began by determining the U.S. national security requirements (direct defense, indirect defense, and civilian) for such items. Identification of requirements was based upon the guidance in National Security Directive 47 which states that maintenance of the capacity to mobilize resources efficiently and effectively in the event of a national emergency is of fundamental importance to U.S. national security. The directive further states that the broadly defined crisis scenarios are to serve as the principal basis for mobilization planning.

We determined that this investigation could most appropriately be conducted using the scenario developed for National Defense Stockpile planning. Therefore, requirements calculations were made under the assumed emergency conditions it contains.

The Department of Defense (DOD) provided the Federal Emergency Management Agency (FEMA) with defense mobilization expenditure levels based on that scenario, from which FEMA derived direct defense and indirect defense production requirements of fasteners. FEMA calculated civilian production requirements for fasteners

based on the defense requirements mentioned above taking into account austerity in consumption patterns and other pertinent considerations and assumptions.

With requirements defined, the next step was to examine the possible sources for meeting them: 1) domestic production and 2) reliable imports.

Approximately 100 companies produce nuts, bolts and large screws in the U.S. Original equipment manufacturers (OEMs), i.e., manufacturers of major consumer end-products and industrial equipment, predominantly automotive and machinery manufacturers, receive the bulk of the fastener shipments. Distributors purchase the remainder. Business in the fastener industry is cyclical, closely tied to demand for manufacturing and consumer durables. When the economy is good and demand for durables is high, the fastener industry flourishes. When the economy turns down and demand for durables shrinks, the fastener industry suffers. The industry is currently in a cyclical downturn.

Poor market conditions have forced various U.S. fastener manufacturers to either alter their product mix, consolidate with other companies, spin off unprofitable operations or go out of business. In general, import penetration has led firms to either eliminate or reduce their production of smaller diameter standard fasteners, and to concentrate their manufacture on more specialized fasteners.

The data collected show that during mobilization, while current domestic production capacity can meet defense requirements, additional supply would be required to meet civilian needs. The shortfall could be reduced in the following ways: 1) surge in domestic production, 2) reliable imports, or 3) a combination of the two.

Historically, the fastener industry has been able to surge its production in times of high demand such as World War II (when it nearly doubled), the Korean conflict and the Vietnam involvement. Lack of skilled labor could be a major constraint to expanding the industry during a mobilization. However, there is evidence that one of the principal reasons the industry has been able to surge in the past is due to the practice of labor hoarding, in which industry finds it more cost effective, even in times of declining demand, to retain its skilled labor force rather than to institute layoffs and train new workers later when demand increases again. Therefore, although the Department of Labor reports that proficiency in skilled workers requires three to eight years to attain, industry analysis indicates that in surge times, labor increases have been comprised largely of unskilled or semi-skilled people (requiring some on-the-job training) who augment the skilled labor pool.

The number of workers in the fastener industry has fallen steadily for the last three years; 23 percent fewer workers were employed in

1982 than in 1979. The decline is not wholly due to imports, but to general sluggishness of the economy. Numerous investigations conducted by the Department of Labor from 1976 to 1981 under the Trade Adjustment Assistance Program, found that 51.6 percent of the laid-off workers had been affected adversely by imports.

During a mobilization one could assume that with the addition of sufficient skilled workers and semi- or unskilled workers, with some on-the-job-training, production could be brought up to its maximum capacity. The addition of more machinery and plant space could increase production somewhat, although availability of skilled labor would remain a limiting factor.

Expansion in the fastener industry has been hampered by high interest rates and restructuring to meet import competition. A high proportion of currently idle machinery is over 15 years old. A large amount of used machinery is inventoried in the free world; hence, there exists an active used equipment market.

Sufficient new machinery with technically up-to-date automated controls can be built in the U.S. by several firms to increase domestic production capacity by just under one-third during the mobilization year and by approximately one-third to two-thirds during subsequent years. Similar machinery could be produced in Japan, Germany, Italy and other countries. Production machinery and fasteners could be shipped to the U.S. during the mobilization year when no shipping losses are anticipated.

The relationship of imports to the shortfall was studied to determine if imports are causal to the shortfall of domestic production compared to requirements. This assessment of imports included an analysis of the 13 1/2-year trend (1969-June 1982) of producer shipments, domestic production, imports, consumption, domestic production capacity, domestic capacity utilization, and the reported price differentials between domestic and imported products. Market penetration by imported products was studied by plotting the ratio of imports to apparent consumption over the 13 1/2-year period.

Imports, although currently down in absolute terms, have increased as a share of the domestic market, from 21 percent of apparent consumption in 1969 to 53.7 percent in the first half of 1982 (by weight).

The State Department has determined that our major foreign suppliers are politically reliable, an indication that their exports of fasteners to us would not be interrupted in time of mobilization or conflict. Principal foreign fastener suppliers in recent years are: Japan, Taiwan, Canada, India, Germany, Italy, The Netherlands and Australia. (In 1981, fifty-one percent (by weight) of U.S. imports of fasteners came from Japan.) Under the terms of the scenario, which specifies that shipping losses from the major exporting countries in Asia would be minimal, our principal Asian suppliers are also considered geographically reliable, whereas Western Europe is not, given predicted shipping losses in the North Atlantic. Imports from Canada are assumed to be assured due to our common border and to the mobilization agreements in place between us. During mobilization and conflict, large quantities of fasteners also could be purchased from Argentina, Brazil, and Mexico, if these countries are able to surge their production.

Because Japan and the other Asian suppliers are dependent upon imports of iron ore, coking coal and other factors of production (except labor) to make steel, their reliability as exporters of fasteners to the U.S. could hinge on their ability to obtain raw materials. Under surge conditions, the U.S. could, if necessary, produce a surplus of these steels and could supply friendly countries which manufacture fasteners for us with fastener grade steel if those countries could not procure the steel elsewhere.

The bulk of U.S. fastener imports are "standards," rather than "specials." Standard fasteners are multipurpose products which are normally mass produced in long production runs. Special fasteners are designed and produced to fit a particular purchaser's requirements, and are usually not inventoried except at the request of an end-user. The ratio of domestic consumption of standards to specials was 3 or 4 to 1 in the late 1950s and is reportedly 2 to 1 today. Results of the analysis of data for this investigation verify that (by weight) imported and domestic standard fasteners comprise 65-70 percent of the market and special fasteners comprise 30-35 percent of the Market. OEMs consume an estimated 90 percent of the specials and more than 50 percent of the standards.

Currently depressed economic conditions and imports of lower priced high volume type standards are about equally responsible for the recent declines in capacity utilization rates for the U.S. industrial fastener industry. The decline can also be explained by the domestic industry's shift into specials production which first became apparent in 1975. Specials production usually results in more downtime because of frequent equipment changeovers or "set-ups" and often longer set-up times. The U.S. is competitive and self-sufficient in specials production, however, only 20 percent of the standards (in terms of pieces) used in the U.S. are domestically produced.

During peacetime, specialization in product lines among friendly nations is not detrimental; in this situation market forces work to bring about the lowest cost for each type of product.

Conclusion

The report shows that there would be a shortfall in domestic fastener supplies to meet scenario-based requirements. Domestic producers of the industrial fasteners under investigation can, in surge and conflict years, meet only the defense requirements for these products. Imports can help us reduce the shortfall in requirements for civilian production. The analysis has shown that most of our foreign sources are politically reliable, due to their stable pro-U.S. governments; and that their geographic locations, in light of projected shipping losses under the scenario, make them reliable in practice, as well. While it is true that the domestic industry has declined, general economic conditions contributed greatly, and import penetration alone is not causal to its reduced capacity.

National Security Investigation per Section 232, Trade Expansion Act of 1962, as amended

A. Purpose of an Investigation

An import impact investigation is conducted to determine the effect of the import of any article, good or commodity on the national security. An investigation includes examination of the effects of imports on all phases of U.S. productive capacity necessary to meet a selected emergency scenario, as well as other factors related to national security.

Based on this report, the Secretary of Commerce will present the findings and recommendation to the President, who will determine what action, if any, is necessary to adjust the import of these products so that they do not threaten the national security.

B. Legal Authority

1. The Law

Under Section 232 of the Trade Expansion Act of 1962, as amended (19 USC 1862) the Secretary of Commerce, in consultation with the Secretary of Defense and other appropriate agencies, has the responsibility to conduct an investigation to determine the effect on the national security of imports of any article which may be the subject of a specific request by the head of any department or agency, by request of an interested party, or upon his own motion.

This function was transferred to the Secretary of Commerce from the Secretary of Treasury by Reorganization Plan No. 3 of 1979 (44 FR 69273) and as provided by Executive Order 12188 of January 2, 1980. The effective date of the transfer was January 2, 1980.

2. The Regulations

To properly administer the responsibilities under the statute, regulations were promulgated prescribing procedures to be followed by the Department of Commerce to commence and conduct an investigation to determine the effect on the national security of the imports of any article. These regulations are found in Title 15, Code of Federal Regulations, Part 359, "Effects of Imported Articles on the National Security."

The regulations include requirements for the initiation of the investigation, the criteria for determining the effects of imports of the article on the national security, guidance to applicants as to the filing and content of requests and applications for investigations, the conduct of an investigation, the Secretary's report to the President, and the public availability of the record of the investigation.

C. Critical Factors of an Investigation

The regulations require that certain criteria be used to determine the effect of imports on the national security. They include:

(a) requirements of the direct defense, indirect defense and essential civilian sectors;

(b) domestic production needed for projected national defense needs;

(c) capacity of domestic industries to meet projected national defense needs;

(d) existing and anticipated availability of labor (skilled and unskilled), raw materials, products, production equipment and facilities, and other supplies and services essential to the national defense;

(e) growth requirements of domestic industries to meet national defense requirements;

(f) quantity, quality and availability of imports;

(g) impact of foreign competition on the economic welfare of the essential domestic industry;

(h) serious effects of imports on the possible displacement of domestic products, unemployment, decrease in revenues to the government, loss of investments, loss of specialized skills and loss of productive capacity;

(i) any other relevant factors that may weaken our national economy; and

(j) other factors relevant to national security in light of the peculiarities of each case.

Further, each criterion is applied within the limits of a selected scenario approved by the National Security Council. Details of the emergency mobilization levels established by the scenario (classified) provide the Secretary of Commerce with specific industry requirements based on industrial data acquired by other agencies.

In addition, the total impact of the proposed action or inaction must be investigated. This includes foreign policy considerations, international trade policy, and procurement agreements.

Finally, it should be understood that the purpose of a Section 232 investigation is to safeguard the security of the nation, not the economic welfare of a company or an industry, except as that welfare may affect the national security.

D. Conduct of an Investigation

When an application to request an investigation is received by the Department of Commerce from another agency or department, or from an interested party, the regulations (15 CFR 359) require that the Department shall consult with the Department of Defense and other appropriate officers of the U.S. to determine the effect on the national security of the imports of the article in question. The Department may afford the public an opportunity to comment and present information and advice relevant to the application, if appropriate.

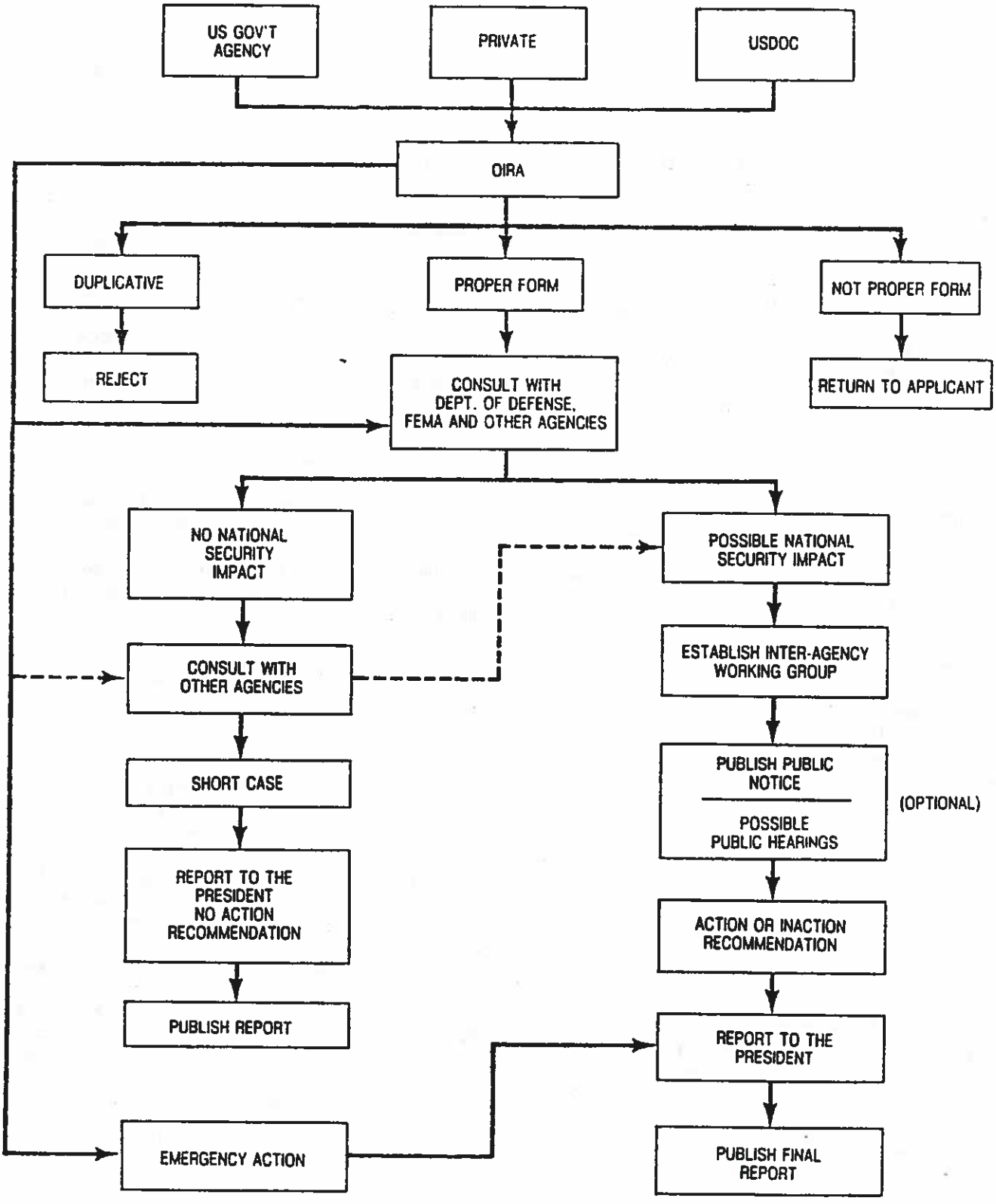
From that point forward, the Department will convene an interagency panel for detailed consultations and prepare a report to the President following the guidelines in the regulations and the statutes. A final report will be published in the *Federal Register* upon disposition of each request for an investigation.

A flow chart outlining the steps to be followed in the investigation is presented below.

U.S. Department of Commerce
Industrial Resource Administration
Resource Assessment Division

SECTION 232 - ACTION FLOW-CHART

REQUEST FOR AN INVESTIGATION BY:



Investigation of Imports of Nuts, Bolts and Large Screws

I. BACKGROUND AND METHODOLOGY

A. Background

On February 11, 1982, the Secretary of Defense requested that the Secretary of Commerce conduct an investigation to determine the effect on the national security of imports of nuts, bolts and large screws of iron or steel (excluding mine roof bolts, but including lag screws and bolts). The Department of Commerce (DOC) then initiated an investigation under the authority of Section 232 of the Trade Expansion Act of 1962 (TEA), as amended (19 USC 1862). This section authorizes the Secretary to initiate such an investigation "upon request of the head of any department or agency, upon application of an interested party, or upon his own motion..." Appendices A and B contain a copy of the Act and applicable regulations.

In his petition, the Secretary of Defense stated: "...data indicates that a significant shortfall in our industrial capability as related to national defense needs existed in 1977. The situation probably has worsened since that time because our mobilization requirements have increased (over 6 percent), and the output of the domestic industrial base has not improved." He further stated that "We must not be placed in a sole source foreign dependency situation for mobilization production needs." This investigation focuses on the effects of industrial fastener imports on all sectors of U.S. productive capacity needed to meet the requirements of the selected emergency scenario, as well as on other factors related to national security.

The Act states that:

> "The Secretary shall report the findings of his investigation ... with respect to the effect of the importation of such article .... The President shall take such action, and for such time, as he deems necessary to adjust the imports of such article... so that such imports will not threaten to impair the national security ...."

The investigation concerns imports of the following industrial fastener categories as defined by the Tariff Schedules of the U.S. (TSUS):

Item No.

646.4920 Lag screws or bolts (of iron or steel)

646.5400 Bolts and bolts and their nuts imported in the same shipment (of iron or steel)

646.5600 Nuts (of iron or steel)

646.6320 Cap Screws (of iron or steel) having shanks or threads over 0.24 inch in diameter

646.6340 Other screws with shanks or threads over 0.24 inch in diameter (of iron or steel)

Notice was published in the Federal Register (47 FR 13546) on March 31, 1982, advising the public that an investigation was being conducted and inviting interested parties to submit written comments. The Notice and a synopsis of the comments received are included in Appendices C and D.

Prior Trade Actions Affecting the Nuts, Bolts and Screws Industry

The nuts, bolts and screws industry has been the subject of previous investigations conducted under Section 232 of the Trade Expansion Act of 1962; Sections 201 regarding escape clause actions and 203 escape clause extensions of the Trade Act of 1974; and Section 303 concerning countervailing duty actions, of the Tariff Act of 1930, as amended. (See Appendix E for a full discussion of these investigations.)

B. Methodology of this Investigation

1. Criteria

The Department of Commerce regulations governing Section 232 provide certain criteria for determining the effects of imports on the national security.

a. Criteria Used in All 232 Investigations.

Factors considered in making any Section 232 decision include:

1) requirements of the direct defense, defense production and civilian sectors of the national economy;

2) domestic production needed for projected national defense needs;

3) capacity of domestic industries to meet projected national defense needs;

4) existing and anticipated availability of labor (skilled and unskilled), raw materials, production equipment and facilities, and other supplies and services essential to the national defense;

5) growth requirements of domestic industries to meet national defense requirements;

6) quantity, quality and availability of imports;

7) impact of foreign competition on the economic welfare of any essential domestic industry;

8) serious effects of imports on the possible displacement of domestic products, unemployment, decrease in revenues to the government, loss of investments, loss of specialized skills and loss of productive capacity;

9) any other relevant factors that may weaken the national economy; and

10) other factors relevant to the national security in light of any unique circumstances associated with each case.

b. Additional Factors Used in this Investigation

During this investigation, the following additional factors were reviewed.

Difference Between Standard Type and Special Type Fasteners

This study differentiates between the roles of the industrial fastener industry's two product sectors: standard fasteners and special fasteners.

Fasteners commonly used by industry, and catalogued in manuals, are termed standard fasteners. Fasteners which cannot be referenced from accepted norms, and are not normally inventoried, but are custom manufactured to the purchaser's specifications, are called specials.

Required Special Raw Materials

The domestic availability of cold header quality (CHQ) steel, a primary requirement for the production of nuts, bolts and large screws was also investigated. Currently such steel is imported in large quantities by the fastener industry because imported steel is highly price competitive. However, it was established that an adequate supply of CHQ steel could be produced by the U.S. steel industry during a mobilization.*

*/See Appendix G for detailed report.

Use of Production Machinery

Section II, Part F of this study reviews the specialized production machinery used to manufacture industrial fasteners. These machines are known as cold-headers, formers, threaders and tappers. It was found that U.S. equipment and machine tool manufacturers would be able to make the necessary production machinery during a mobilization.

2. Procedures

This investigation was conducted in a systematic, multi-step process, with each criterion (see Section I., Part B. 1., Criteria) addressed as follows:

- National security policy determinations and mobilization planning documents were examined for guidance in developing a framework for the investigation. It was determined that the National Security Council-approved mobilization scenario, used as a basis for stockpiling and other mobilization planning, would also be suitable for use in this investigation as a basis for identifying mobilization requirements.

- Data regarding the U.S. industry's capacity to produce nuts, bolts and large screws, its pricing policy, and distribution patterns were collected via an industry survey. Data previously published by the ITC were updated and incorporated in some sections of this study.

- Projections were made of: 1) the available domestic supply of industrial fasteners, (including inventories of original equipment manufacturers (OEMs), importers and distributors); and 2) the supply of secure imports during a national emergency.

An analysis of available data relating to each product subject to this investigation was undertaken to determine whether imports posed a threat to the national security on an individual product basis.

A more detailed description of each step of the investigation is provided below.

a. National Security Considerations

Current national security mobilization planning policy outlined in National Security Decision Directive 47 (NSDD 47), of July 22, 1982, "Emergency Mobilization Preparedness," states that it is of fundamental importance to the national security for the United States to maintain the capability to mobilize its national resources in a timely and efficient manner in order to respond effectively to any potential crisis. The Directive further states

that maintenance of mobilization capability requires consistency and coordination within the United States government in all civil and military mobilization planning activities. In this regard, NSDD 47 directs: (1) that the broadly defined crisis scenarios, emergency actions and preparedness activities developed by the National Security Council are to serve as the principal basis for future U.S. civil and military mobilization planning and (2) that all such future planning is to be fully coordinated with all affected Federal agencies.

Therefore, this investigation has been conducted according to the policy direction of NSDD 47, with the assistance of all appropriate Federal agencies.

Scenario

Mobilization requirements were determined in accordance with the above-mentioned policy directive and NSD memorandum 337, "Strategic and Critical Materials Stockpile," August 23, 1976, which is classified.*

Mobilization Requirements

To measure the total mobilization requirements for the fasteners covered by this investigation, calculations were made under conditions of the assumed scenario for direct defense, defense production and civilian production needs, and for the content of essential consumer products and industrial expansion. The Federal Emergency Management Agency (FEMA) calculated the direct defense and defense production requirements for fasteners based on defense mobilization expenditure levels provided by the Department of Defense (DOD). The defense mobilization expenditure levels were statistically converted into the value of industrial fastener requirements to meet direct defense and defense production needs by developing a 36-industry commodity-by-commodity input/output table from the 1972 Use-and-Make tables for the U.S. economy developed by the DOC's Bureau of Economic Analysis. These expenditure levels were projected based on this Administration's national security policy guidance. FEMA also provided projections of fastener requirements for civilian production taking into consideration projected defense expenditures, plus austere personal consumption, private investment needs, foreign trade and civilian government purchases based on the DOC's estimate of normal consumption patterns.

b. Interagency Coordination and Data Collection

The DOC's Bureau of Industrial Economics surveyed major domestic producers and importers to obtain data complementary to that already available on production capacities and utilization, shipments, machinery, inventories, exports, imports, production workers, expenditures, selling prices, and financial data. The

*/Memorandum of description is available for those with need-to-know.

survey results were used in this report. Data are now current through June 30, 1982. Additional analyses were partly based on import and export data obtained from the DOC's Bureau of the Census.

The Act requires that the Department of Commerce consult with the Department of Defense and other relevant government agencies in conducting a Section 232 investigation. An interagency working group headed by the DOC was established for this purpose.

Contributions to this investigation are as follows:

- The Department of Defense provided mobilization expenditure data and information on the machine tool reserve and machine tool trigger order programs.
- FEMA analyzed final demand expenditure level data, and prepared the estimated mobilization requirements for nuts, bolts, and large screws.
- The Department of State analyzed the trade and foreign policy implications of potential import actions. It also reviewed the reliability of foreign industrial fastener suppliers during a mobilization.
- The Department of Labor identified trends in the number of production workers in the fastener industry, their training needs, job and skill proficiencies, and wage patterns. Labor also supplied details of the availability of workers with special skills from related industries, and the impact imports have had on employment.
- The Department of the Treasury assessed the effects on the industry of the President's Economic Recovery Program and other tax incentives.
- The U.S. Trade Representative identified various trade actions which have had and will have a bearing on this industry.
- The Council of Economic Advisers* reported on the costs and benefits of import restrictions on industrial fasteners, and the impact on the economy of a significant shift from overseas to domestic supplies of fasteners.

3. Analysis and Conclusion

The analysis "to determine the effects on the national security of imports ..." was done in two steps. First, projected mobilization requirements for the products were compared with total anticipated supply from domestic production and reliable imports.

*/See Appendix I.

Second, where there is a shortfall in supply, we assessed whether that shortfall is caused by imports. In making this determination, various data for the 13-1/2 year period of 1969 to June 1982 were assessed. The data included producer shipments, domestic production, imports, consumption, domestic production capacity, domestic capacity utilization, and the reported price differentials between domestic and imported products. Market penetration by imported products was also examined.

II. NATURE OF THE DOMESTIC INDUSTRY

Approximately 100 companies* produce nuts, bolts and large screws in the U.S. Firms located in Illinois, Ohio and Michigan account for almost 60 percent of the value of domestic shipments. Another 28 percent of shipments originate in the Middle Atlantic and New England states. Original equipment manufacturers, i.e., manufacturers of major consumer end-products and industrial equipment (predominantly automotive and machinery manufacturers), receive the bulk of the fastener shipments. Distributors purchase the remainder.

Business in the fastener industry is cyclical, being closely tied to demand for manufacturing and consumer durables. When the economy is good and demand for durables is high, the fastener industry flourishes. When the economy turns down and demand for durables shrinks, the fastener industry suffers.

Changing market conditions have forced various manufacturers to either alter their product mix, consolidate with other companies, spin off unprofitable operations or go out of business. In general, import penetration has led firms to either eliminate or reduce their production of smaller diameter standard fasteners, and to concentrate their manufacture more on larger standard fasteners and special fasteners.

Several producers have consolidated their operations. For example, Camloc, Rockford Products and Tridair, firms supplying the automotive, electronics equipment and aircraft industries, were recently acquired by Rexnord (a materials handling and machinery equipment manufacturer). The acquisition by Textron of four fastener manufacturers helped it become one of the largest fastener producers in the U.S. today. Russell, Burdsall & Ward, also a leading fastener manufacturer, in 1981 sold a controlling interest to Automotive Hardware, Ltd., a Canadian fastener producer. Many other firms have also elected to consolidate their operations.

Other companies have closed down operations in the face of losses. For example, Lamson & Sessions Co. of Cleveland, Ohio, formerly one of the largest fastener manufacturers in the U.S., eliminated its fastener business in 1981, selling most of its manufacturing equipment to competitor Russell, Burdsall & Ward. In 1982, at least three other firms ceased operations: ITT Harper, Assembly Line Products and Great Lakes Screw. On January 3, 1983, Armco Inc., of Kansas City, Missouri, announced the closing of its nut and bolt plant. At least 36 fastener producers have closed plants and/or divisions since 1969.

*/See Appendix H.

In spite of setbacks suffered by the industry, some new firms have ventured into the fastener business in recent years. While the exact number is not available, the trade press reports the entrants have been generally small in size and are principally producers of special fasteners.

A. Trade Adjustment Assistance to Firms

Trade Adjustment Assistance, authorized under Chapter 3, Title II of the Trade Act of 1974, provides for financial and technical assistance to firms adversely affected by imports. Since April 1975, the DOC has certified seven petitions for trade adjustment assistance filed by producers of industrial fasteners. Five of these petitions have been certified since April 1980. Assistance, totalling $127,802, has been in the form of technical advice, the development of business plans and management control systems, improvements in cost systems management training, and an engineering and market study.

The bulk of the government outlays have been directed to one company: Rockford Headed Products of Rockford, Illinois. That company received $88,730 in October 1979 for the development of improved management control systems and provided $26,244 of its own money for the same purpose.

B. The Products

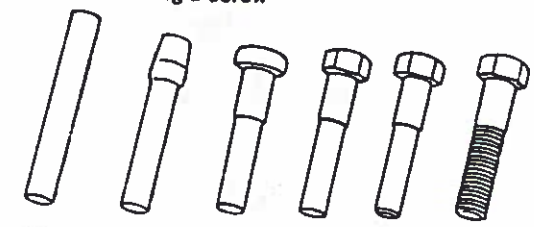
Nuts, bolts and large screws (0.24 inch in diameter and larger) of iron or steel, commonly called industrial fasteners, are mechanical devices designed specifically to hold, join, couple or assemble multiple components. Most U.S. industries require such fasteners. The leading users of nuts, bolts and large screws include the automobile, construction, industrial equipment and home appliance industries.

Nuts, bolts and large screws come in a variety of shapes and sizes. More than a million types are produced. These industrial fasteners are distinguished not only by their configurations but also by their tensile strength and thread form and fit. Proper fastener selection and application are critical to ensure properly fitting assemblies.

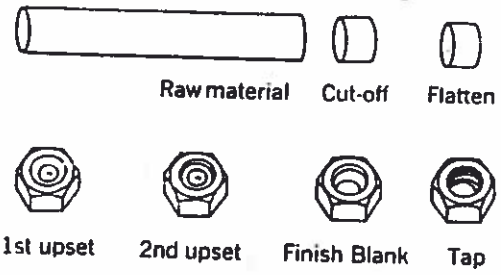
Nuts, which are perforated metal blocks, are threaded internally. Nuts are paired with bolts and certain kinds of screws. Common types of nuts include square and hex nuts, machine screw nuts, locknuts and wing nuts.

Bolts and large screws are externally threaded fasteners which are headed at one end. A bolt is designed to mate with a nut and may be tightened or loosened by turning the nut. A bolt is often identified by head type. Some varieties of bolts are square and hex bolts, round head bolts, and high strength structural bolts.

Stages in making a screw



Stages in Cold Nut Manufacturing:



Bolt (Screw), Lag, Hexagon Head, Gimlet Point

Large screws are fasteners used to join parts carrying their own matching threads, either pre-formed or created by the screw. Screws may generally be tightened or released by torquing or twisting their heads. Cap screws represent the bulk of the large screws under investigation. Cap screws are said to be replacing bolts in some applications. Other types of large screws investigated include lag, tapping, set, and wood screws.

C. Manufacturing Processes*

The basic method of manufacturing most nuts, bolts and large screws subject to this investigation is cold forming. This is a process of forcing unheated metal to flow into dies to change its shape. The machines used are called "headers" and "formers," which are actually high-speed multi-blow presses.

Nearly all bolts and large screws under one inch in diameter are cold forged, a process that conserves energy. Hot forging is usually required in the manufacture of bolts and large screws one inch and over in diameter. Today, nearly all large screw threads are rolled by squeezing a bolt or screw between reciprocating or rotating dies.

Nut blanks are produced in one of the following ways: cold forming, hot forming, and cold punching. The most common method is cold forming, where the machinery cuts round wire to the proper length, shapes the wire into a hexagonal nut, and punches the hole. The hot forming method is similar to cold forming except that the raw material is heated to forging temperature before being fed into the machine. In cold punching, rectangular bar stock is fed into the machine, and in successive steps a hole is punched and countersunk, the bar is sheared, and the nut is beveled and trimmed.

Regardless of the method employed to produce the nut blank, the tapping operation to produce the thread is generally the same. Nuts 3/4 inch in diameter and smaller are tapped in automatic machines, and large nuts are tapped in hand-fed machines.

D. Standards and Specials

This investigation has recognized the accepted industry distinction between "standard" and "special" iron and steel fasteners. Standard fasteners are multipurpose products which can usually be referenced from published industry sources, and can be produced and held in inventory. They are normally mass produced in long production runs.

*/USITC 1193, November 1981.

Special fasteners are designed and produced to fit a particular purchaser's requirements, frequently from the purchaser's own drawings, and they usually have at least one characteristic which cannot be referenced from a standards manual. Specials are normally not inventoried except at the request of an end-user.

More standards are consumed than specials; the ratio of domestic consumption of standards to specials was 3 or 4 to 1 in the late 1950s and is about 2 to 1 today. Standard nuts, bolts and large screws comprise 65-70 percent of the market, and special fasteners comprise 30-35 percent of the market. Original equipment manufacturers, who are the primary contributors to a mobilization effort, consume an estimated 90 percent of the specials, and over 50 percent of the standards.

The investigation found that about 85-90 percent of imported nuts, bolts and large screws are standards, although imports of specials have been increasing in recent years.

From these observations, investigators estimated, as import data is not so reported, the volume of standards and specials imported into the U.S. and the volume domestically produced and shipped. A comparison between standards and specials allowed for calculations and assessments in terms of import penetration, the ability of the domestic industry to produce both types, and mobilization requirements.

With FEMA's estimations for nuts, bolts and large screws, mobilization requirements were calculated for standards and specials based on consumption patterns of original equipment manufacturers (OEMs). This analysis aided in determining whether imports, especially imported standards, have impaired the domestic industry's ability to produce emergency needs for standards as well as specials.

E. Steel for Fastener Production*

Cold-header quality steel used to manufacture fasteners in the U.S. is both produced in the U.S. and imported, mainly from Japan. Due to cost and quality differences, an estimated 60 percent of the steel used is imported. However, under a mobilization, the U.S. could produce the necessary quality and amount of fastener grade steel.

The high relative cost of cold-header quality steel available to the domestic industry compared with that available to foreign producers is reported to be a key competitive problem facing the industry. The high cost of steel has reduced U.S. fastener industry competitiveness, particularly in the high volume standard fasteners' market sector. Standard fasteners have a high material cost (about 40-50 percent) to total cost relationship.

*/See Appendix G.

The Japanese, by furnishing 25-30 percent (by weight) of our fastener requirements in addition to large quantities of fastener quality steel, are directly and indirectly responsible for approximately 55-60 percent (by weight) of overall U.S. supplies of nuts, bolts and large screws of iron and steel.

Cold-header quality steel in the form of wire, wire rod or bar stock is purchased in coils or straight lengths, usually in lots of 10 tons or more, ranging from less than 1/4 inch to well over one inch in diameter. It is important that the steel's surface be essentially free of surface defects, with a maximum seam depth of only a few thousandths of an inch preferred for most applications. Fastener demands also generally require that tight control over the steel's chemical composition (carbon content, additives and tramp elements) be established and maintained. In addition, the steel must usually be of a type that is readily heat treatable, for strengthening, softening or hardening as necessary.

Carbon steels ranging between American Iron and Steel Institute (AISI) specifications 1010 to 1041 (tensile strength from 60-150,000 pounds per square inch (psi) and carbon content from .10 percent carbon to .41 percent) are commonly used by the fastener industry, accounting for about 85-90 percent of product shipments. AISI 1038 steel (having a tensile strength of 105,000 to 120,000 psi) is used about 50 percent of the time. Alloyed steels that use chromium, vanadium, titanium, manganese and other elements are used about 10-15 percent of the time in applications where their special properties are required.

U.S. fastener firms reportedly were paying 24 to 32 cents a pound for steel in the second half of 1982. A typical price of 28.5 cents a pound for AISI 1038 wire rod was quoted by several sources. This price is actually set by Japanese production costs and is based on the fourth quarter 1981 Trigger Price (TPM),* even though the TPM is no longer officially in effect.

Quoted prices may be somewhat misleading because a poor quality steel as a rule will generate many more defective fasteners than a high quality steel. Most steel companies offer replacement or payback for any defective parts generated from their steels. However, lost machine time and production losses incurred as a result of poor quality steel are costly and unrecoverable. The exacting chemistry and the surface condition of the steel is critical to the quality of the end product. During a mobilization, it is conceivable that the U.S. could ship fastener quality steel to Japan and other countries for conversion into nuts, bolts and large screws and reexport to the U.S.

*/The TPM was designed to monitor unfairly priced steel imports by comparing import prices with fair value prices based on Japanese costs of production and delivery as representative of the lowest cost world producer.

In an survey conducted in conjunction with this investigation, DOC's Bureau of Industrial Economics reported that U.S. fastener grade steel capacity is adequate to meet current and forseeable demand even if imports of such steel are reduced or virtually eliminated.

The Bureau reports that imports of high-quality Japanese steel has motivated domestic producers to improve the quality of cold-heading and cold-forming quality steel and to lower prices.

F. Machinery Used by the Industry

The availability of machinery, its condition and efficiency bear on the industry's capacity to produce sufficient fasteners to meet mobilization requirements.

The machinery used in the production of nuts, bolts and large screws includes: headers, trimmers, pointers, threaders, nut formers, tappers and boltmakers. Headers convert wire rod to screw blanks and bolt blanks. Trimmers, pointers and threaders continue the finishing process on screws and bolts. The heading, trimming, pointing and threading of bolts may, however, be integrated into one machine known as a boltmaker. Nutformers produce nut blanks from wire rod, after which the blanks are threaded by tappers.

1. New Machinery

During a mobilization, capacity might be expanded through the use of new and used machinery located in the U.S. and abroad. Currently seven companies produce fastener machinery in the U.S.: National Machinery Company of Tiffin, Ohio, the largest of the seven, manufactures all types of the fastener machinery with the exception of threaders. National is the world's leading manufacturer of boltmakers for bolts ranging in size from 3/8 inch to 1 1/4 inch, and is also a leading producer of cold headers and nut formers. National has production plants in Ohio and West Germany and assembly plants in Illinois, West Virginia and Japan.

Waterbury Headers in Connecticut, recently acquired by Seneca Falls Machinery (SFM) of New York, reported that it is capable of producing a full line of machines. Hartford Special, Inc. of Simsbury, Connecticut, which on December 22, 1982 announced plans to liquidate, has sold part of its line to National Machinery Company. Hartford was the world's leading producer of reciprocating type thread rollers in sizes up to 1 1/4 inch and point formers. Hartford produced cold headers up to 3/8 inch under a licensing agreement with Hilgeland of West Germany. The firm announced that ultimate disposition of the header line is still under discussion. In the meantime Hartford will continue to service those machines.

Pruton Company, with plants in Cleveland, Ohio, and Holton, Massachusetts, and Ruja Tooling Corp., of Columbia City, Indiana, both produce a less popular type of thread roller, known as a rotating or planetary type thread roller, in sizes up to 1 1/4 inch. Behr Machinery, Inc. of Rockford, Illinois, produces headers and rebuilds used machinery. Finally, Warren Industries of Illinois manufactures thread rollers and is one of the few, if not the only firm, to make slotters, machines which slot the head of a screw.

National Machinery Company reported that it stocks selected machinery, based on historical sales, and also builds machinery to order. A National spokesperson states that an order for one machine in an economic upswing may lead the firm to build five to ten of the same machine as a means of realizing economies of scale and of anticipating future orders. Pruton, Ruja, Behr, Warren Industries and Waterbury Headers do not inventory machinery; they build solely to order.

The time from order to delivery varies. Depending on the business cycle, National will deliver in three to 12 months. Waterbury Headers indicates that eight to 10 months is normal delivery time. Respondents to the industry survey conducted for this investigation (producers of nuts, bolts and large screws) reported delivery times of eight to 12 months for nut formers and five to 21 months for boltmakers and cold headers.

National reported that during an emergency it could produce, within 10 to 12 months, approximately 20 boltmakers of various sizes, 20 nut formers, and at least 85 headers with additional units produced during each successive four-month interval. Waterbury Headers, being proximate to a large labor pool, claims that it can double production, if necessary, and manufacture twenty of any kind of machine in eight to 10 months.

New machinery produced in the U.S. could supply an estimated equivalent of 500 million pounds of fastener production capacity by the end of the first year of a mobilization and 500 million to one billion pounds during subsequent years. The estimated time it would take to receive, install and debug new machine tools, such as nut formers, bolt makers, and cold-headers to meet surge requirements ranges from 6-30 months.

Sources of new machinery outside the U.S. include Japan, Taiwan, Italy, West Germany, and The Netherlands. In Japan, cold headers can be purchased from two firms, boltmakers from one firm, and nut formers from one firm. In Taiwan, one company produces nut formers. In Italy, two companies produce cold headers, one of which also makes boltmakers. A full line of machines is produced by a firm in West Germany. One company in The Netherlands produces boltmakers.

2. Used Machinery

Approximately 2.5 to 3 billion pounds in annual fastener making capacity of used, i.e., secondary market, machinery is estimated to be inventoried in the free world. As much as one billion pounds of this capacity is estimated to be in the U.S. The secondary market's existence is due to slow machinery obsolescence, the ready availability of used equipment, the substantial savings derived from buying used machinery in a time of high interest rates, and, the fact that the value of used equipment exceeds its scrap value over an extended life. Currently, the secondary market is active and can supply a full range of machinery.

In 1981 one U.S. firm, which claims to be the world's largest seller of used fastener equipment, sold approximately 250 used machines. Half of the machines were sold abroad. This firm, like others in the U.S., states that the long-depressed domestic market has encouraged the sale of used equipment abroad, where until recently, the market was on a firmer footing than in the U.S.

3. Machinery Held by Fastener Producers

Machinery held but not used at this time by U.S. fastener producers represents 245 million pounds of their capacity. Some of the machinery has been cannibalized for parts and most of it is at least 15 years old. It would take one week to 18 months to bring the uncannibalized machinery into production status, whereas three months to two years are required to gear up cannibalized machinery.

4. Machinery Maintained by DOD

The Department of Defense (DOD) maintains a store of additional, idle machinery which could ostensibly be used by the nut, bolt and large screw industry during an emergency. In the Defense Industrial Equipment Reserve there are currently* one cold header for making bolt blanks, eight cold headers/trimmers (three of which can produce and finish bolt and screw blanks, and five of which can produce and finish screws blanks alone), and two cold nut formers. None of the machines has threading and pointing capabilities.

5. Machine Tool Trigger Order Program (MTTOP)

The MTTOP administered by the DOD and the Commerce Department is designed to cut mobilization lead-times by speeding delivery of machine tools essential to defense production. Under the program standby purchase agreements are negotiated between the government and individual machine tool manufacturers. To assure the building of machine tools, manufacturers are assigned priority access to materials during a mobilization. Industrial fastener machine tools are currently not included in the MTTOP.

*/As of November 23, 1982.

6. Cost of Machinery

High interest rates, poor market conditions and declining market shares have discouraged the purchase of newer, more advanced machinery by fastener producers.

Prices of new machinery vary widely. Generally, the larger the product size capability of a machine, the greater the weight and price. Large boltmakers (1 1/4 inch) weigh up to 100 tons and cost $1.8 million. A small boltmaker (3/8 inch), in contrast, is quoted around $500,000. Cold header prices also vary according to the number of dies a machine has and the number of blows it can exert. The least complex and smallest cold headers (1500 lbs.) are priced around $30,000. The largest (84 tons) and most complex machines cost about $1.5 million. Thread rollers range from $45,000 for the smallest (1,200 pounds) to $300,000 for the larger models (17.25 tons). Nut formers range from $150,000 for smaller models (10 tons) to $900,000 for larger models.

In some cases substantial savings can be derived from purchasing used machines, in other instances the savings are minimal. Small used machinery is generally much slower than similarly sized new machinery. As a result, the used machine may cost as little as 25 percent or less of the price of a new machine. The speed differential of new and used large machinery is disproportionately less than that for small machinery. Consequently, the price of large used equipment will be as much as 70-80 percent that of the new. Other factors affecting used equipment prices are the machine's age, condition and availability, and demand for the product.

7. New Technology: In-Process Controls

Computer assisted technology, such as in-process controls, is a relatively new innovation to the production of fasteners. In-process controls are computer activated, closed-loop signals adapted to the fastener production machine (cold-headers, etc.). The controls ensure that a machine is stopped if it malfunctions or if it begins to produce defective items. Such other functions as counting, weighing, and sizing are also often provided. In-process controls serve to: reduce scrap, reduce tooling costs, improve quality control, and increase equipment utilization. In a 1981 study commissioned by the Department of Commerce, the New England Research Application Center (NERAC) at the University of Connecticut noted that in-process controls can reduce production costs up to 30 percent, and thereby increase productivity. In process controls cost between $10,000 and $25,000. The payback period for the purchase is a few weeks to 1 1/2 years.

Machines equipped with in-process controls may be utilized for "ghost-shift production," which enables machinery to run without operator assistance for short periods of time. The controls shut down a machine if disturbances in the production process arise. In Europe productivity gains of up to 25 percent have been recorded as a result of ghost-shift production procedures.

The use of in-process controls in the U.S. is small in comparison to use overseas. Approximately 400 in-process control units have been installed in the U.S. This compares with the more than 1000 units installed in Western Europe, 800 of which are located in German facilities. Use of in-process controls in Japan is believed extensive. The number of units in the Far East approximates that in Western Europe.

8. Prospects for Machinery Investment

New investments in fastener machinery eventually may result from the Economic Recovery Tax Act of 1981 (ERTA) which substantially reduces the level of corporate taxation. The Act increases investment tax credit rates to six percent for three-year equipment and 10 percent for equipment with an estimated useful life of five years or more. Machinery and equipment depreciation schedules, moreover, are simplified and generally accelerated into categories of three, five, and 10-year lives. Effective tax rates on investments for the fabricated metals product industry which includes fasteners will be 32.2 percent after 1982, compared with the 47.6 percent prevailing prior to the Act's adoption.

9. Machinery Operation - Operating Costs

Machines and skilled machine operators are essential to the production of nuts, bolts and large screws. A machine's efficiency is gauged by its rated speed, usually expressed in parts per minute, its utilization and the skill of the operator. The operating cost varies widely for individual batches but is linked to the length of the run, size and hardness of the parts being produced and the ability of the operator to minimize downtime. Potential costly problems are the excessive generation of scrap and/or overruns, production of defective parts and extended downtimes due to machine failure.

Production costs, averaged over a year for an integrated firm, amount to about 35 to 50 percent for materials; 20 percent for conversion (converting raw material into a finished product); and 30 to 40 percent for overhead. Conversion includes the cost of the machine operator (3-8 percent), the labor in the tooling, heating and finishing operations (10-15 percent), and materials processing (2-3 percent). Some of these functions, except for the machine operation itself, are frequently contracted out.

Material, conversion and overhead costs vary according to a firm's degree of specialization. Firms concentrating on larger fasteners will have higher material costs than others. Those specializing in high volume standards have lower overhead and conversion costs and relatively higher material costs. Concentration in low volume specials means greater overhead and higher conversion costs.

G. U.S. Tariff Treatment and GSP

On January 6, 1982, import relief in the form of 15 percent ad valorem tariffs on imported nuts, bolts and large screws terminated as did incremental duties of 0.2 cents per pound and 0.1 cent per pound, respectively, on imported bolts and nuts.

Column 1 Most Favored Nation rates of duty now in effect are as follows: .2 percent ad valorem on imported nuts; .7 percent ad valorem on bolts; 9.5 percent ad valorem on cap screws and other screws greater than .24 inch in diameter; and 12.5 percent ad valorem on lag screws.

In addition to Column 1 rates of duty, countervailing duties are collected on certain nuts and bolts from Japan and screws from India.

Nuts and bolts were designated for duty-free treatment under the Generalized System of Preferences (GSP) on January 1, 1976. In accordance with Section 503(c)(2) of the Trade Act of 1974, duty-free entry of nuts and bolts under GSP was suspended during the period import relief was in place. When the import relief expired, bolts (TSUS 646.5400) and nuts (TSUS 646.5600) were again eligible for duty-free treatment under the GSP.

The interagency GSP Subcommittee of the Trade Policy Staff Committee (TPSC) is currently reviewing the request of the United States Fastener Manufacturing Group (USFMG) to remove nuts and bolts from the list of articles eligible for duty-free treatment. In accepting this request, the TPSC reserved the right to recommend the graduation of individual countries from eligibility on nuts and bolts. A decision on the USFMG request will be made by the President in March 1983.

The Column 1 rates of duty on cap screws and other screws over 0.24 inch in diameter were reduced by 50 percent following the Kennedy Round of the GATT negotiations (1964-1967). Prior to the Kennedy Round the duty was 19 percent ad valorem.

The Column 1 rates of duty on nuts and bolts became effective in January 1980 following the Tokyo Round of the GATT negotiations. Prior to this the duties on nuts and bolts were 0.1 cent per pound and 0.2 cents per pound, respectively.

By way of comparison, Japan, which is the leading exporter of fasteners to the U.S., levies a temporary duty of up to six percent on nuts, bolts and screws imported to Japan from other countries.

Tariff rates for TSUS item numbers 646.4920, 646.6320 and 646.6340 were not reduced in the GATT Tokyo Round of negotiations, but all of these items have been the subject of concessions in earlier rounds of GATT negotiations, and all are therefore bound in GATT at their present rate of duty. Thus, any increase in the tariff rates would violate our GATT obligations on these items and subject the United States to pay compensation to those countries having initial negotiating rights under the rules of GATT or permit both countries to retaliate against the United States.

H. Pricing

Although fastener costs are a small part of total costs for most manufactured products, failure to obtain fasteners can lead to very costly production line shutdowns. Thus, the demand for fasteners is a reflection of the overall demand for manufactured goods rather than of price. The total demand for nuts, bolts and large screws is, therefore, relatively insensitive (i.e. inelastic) to changes in price. If prices were reduced for both imported and domestic fasteners, total consumption of fasteners would probably not increase appreciably in the short run. It is doubtful, even in the long run, that consumption would markedly increase because the major cost to manufacturers is not the fasteners themselves, but the cost of their installation in assembled parts and components.

While the demand for fasteners is relatively inelastic, the supply of fasteners is highly responsive to price (i.e., elastic). The Council of Economic Advisors estimated that a 10 percent increase in price will induce a 30 percent increase in fastener supply.

In an elastic supply-inelastic demand market, firms will compete for market share through the pricing mechanism. Price competition is undoubtedly the key consideration for general use standard type fasteners. However, it is not at all clear that the same conditions pertain to special type fasteners. Special fasteners appear to compete on the basis of quality, lead times, reliability of supply and firm specialization, and secondarily on the basis of price. Because there is significant variation among specials, it is not appropriate to make price comparisons between the domestic and foreign-made products.

The following analysis is based on prices received by U.S. producers and importers on sales of standard fasteners to distributors for the period January 1972 - June 1981. Producers and importers did not make available prices for the July 1981 - June 1982 period. The lowest net selling prices received on sales of six representative standard fastener products were selected for comparative purposes to cover a broad range of diameters (1/4" - 3/4"), lengths (1" - 3"), and grades of steel, where U.S. producers and importers compete head to head and where price is an important consideration. The six products are hexagon nuts, 1/4"-20 and 1/2"-13; cap screws, 3/8"-16 x 1", grade 2 and grade 8; carriage bolts, 3/8" x 3"; and, high strength structural bolts (with nuts), 3/4" x 2". Aggregated results showing the averages of domestic and import prices and the ratio of import prices to domestic prices can be found in Tables A, B, and C, at the end of this part.

The average net selling prices received by importers have fluctuated considerably more than domestic prices. From January-June 1972 through April-June 1974, import prices increased about 175 percent; certain items nearly quadrupled in price. During this period, panic buying, shortages, and lengthening supply lead times characterized the U.S. market. Distributors, desperate for supply, bid up prices. Then, in late 1974, the volatile market changed direction. Demand fell rapidly and inventories, swollen to record levels, began to exert enormous downward pressure on prices. The dramatic turn in the market immediately affected import prices, which fell more than 40 percent within a matter of months. Import prices remained depressed during 1975, 1976, and 1977.

Prices of Japanese and Taiwanese fasteners offered by U.S. importers increased signficiantly during January-June 1978. Such increases, ranging from 40 to 60 percent on nuts and from 15-20 percent on large screws and bolts, probably came from the appreciation of the yen and a tightened steel market in Japan. In December 1977, the exchange rate stood at about 240 yen to the dollar; by October 1978, this rate had dropped to less than 190 yen to the dollar, representing an increase of nearly 26.5 percent in the dollar value of the yen. To the extent Japanese fastener producers attempted to maintain constant prices in yen, the depreciation of the dollar increased the dollar price of Japanese fasteners. However, the devalued dollar also lowered the Japanese cost of steel. The cost of steel represents at least 50 percent of the cost of manufacturing fasteners in Japan and because dollar-denominated raw materials, including coking coal, iron ore, and oil, constitute about 50 percent of total Japanese steel costs, about 25 percent of the yen appreciation put an upward pressure on Japanese fastener prices. Taiwan nut producers at this time were heavily dependent on Japanese cold-heading quality steel wire rod and, therefore, were facing similar cost pressures.

Between the first quarter 1979 and the last quarter 1980 import prices increased 11 percent while domestic prices rose only eight percent. The year 1980 was characterized by a depressed market. The yen appreciated from 238 to 209 yen to the dollar from January to December 1980 after having fallen from 198 to 240 yen to the dollar in 1979. Prices were very weak by the end of 1980 after over a year of poor economic conditions.

Price readings for this investigation were obtained for the period July 1981 to June 1982 for sales to original equipment manufacturers (OEMs). Because U.S. producers often sell directly to OEMs, while most foreign-made fasteners first are sold to a distributor and then resold to an OEM, the relevant comparison is between the prices received by U.S. producers and those received by distributors of foreign-made fasteners. The U.S. International Trade Commission (ITC) reported that U.S. producers sell U.S.-made fasteners to both distributors and OEMs at roughly the same price. Distributors of foreign-made products appear to markup and sell their merchandise to OEMs at a price averaging from 10 to 15 percent above the price they originally had paid to the importer. Again, the fasteners selected for this comparison are standards where U.S. producers and distributors of foreign fasteners compete head-to-head. And this is where price is an important consideration. The aggregated results showing the averages of domestic prices and distributor prices of foreign-made fasteners and their ratio can be found in Table D in this Part.

The prices distributors received for foreign made fasteners increased moderately for grade 2 and grade 5 cap screws and also for hexagon nuts, but fell for the other three items between July 1981 and June 1982. Producer prices declined about nine percent with each item showing downward movement. During the year the ratio of distributor prices to producer prices, excluding nuts, advanced from about 97.5 percent to 99.7 percent, indicating that competition between distributors and producers for shares of a contracting market had intensified.

Table A -- Bolts, nuts and large screws: Averages [1/] of lowest net selling prices received by U.S. producers and importers on sales of hexagon nuts to distributors, by specified periods, January 1972 - June 1981.

Period	Hexagon Nuts, 1/4" - 20[2/] (per 1,000 units)			Hexagon Nuts, 1/2" - 13[3/] (per 1,000 units)		
	Average prices			Average prices		
	Import	Domestic	Import Ratio	Import	Domestic	Import Ratio
			Percent			Percent
1972:						
Jan.-June--	$1.89	$3.42	55	$8.77	$11.10	79
July-Dec.--	2.07	3.06	68	8.55	11.01	78
Annual----	1.98	3.24	61	8.66	11.06	78
1973:						
Jan.-Mar.--	2.89	4.21	69	10.01	12.62	79
Apr.-June--	2.55	4.17	61	10.85	12.09	90
July-Sept.-	3.00	4.23	71	11.50	13.28	87
Oct.-Dec.--	4.05	4.10	99	16.64	13.27	125
Annual----	3.12	4.18	75	12.25	12.82	96
1974:						
Jan.-Mar---	5.89	4.73	125	25.47	17.95	142
Apr.-June--	7.14	5.56	128	27.98	22.59	124
July-Sept.-	5.17	7.43	70	22.93	27.73	83
Oct.-Dec.--	3.12	6.76	46	15.63	25.32	62
Annual----	5.33	6.12	87	23.00	23.40	98
1975:						
Jan.-Mar.--	2.08	8.07	26	11.36	26.11	44
Apr.-June--	2.35	8.06	29	11.43	22.89	50
July-Sept.-	2.05	5.96	34	11.55	25.12	46
Oct.-Dec.--	2.14	5.94	36	11.25	25.11	45
Annual----	2.16	7.01	31	11.40	24.81	46
1976:						
Jan.-Mar.--	2.21	5.66	39	11.79	24.22	49
Apr.-June--	2.17	5.66	38	12.22	24.23	50
July-Sept.-	2.31	5.85	39	12.78	25.00	51
Oct.-Dec.--	2.35	5.85	40	13.07	23.84	55
Annual----	2.26	5.76	39	12.47	24.32	51
1977:						
Jan.-Mar.--	2.47	5.72	43	12.76	24.44	52
Apr.-June--	2.40	5.64	43	12.51	24.23	52
July-Sept.-	2.47	6.33	39	12.66	23.52	54
Oct.-Dec.--	2.52	6.45	39	12.77	24.42	52
Annual----	2.47	6.04	41	12.68	24.15	52
1978:						
Jan.-Mar.--	2.84	6.50	44	14.01	25.80	54
Apr.-June--	3.96	6.58	60	18.59	26.20	71
July-Sept.-	4.24	7.42	57	20.54	29.13	71
Oct.-Dec.--	4.16	7.59	55	20.73	29.11	71
Annual----	3.80	7.02	54	18.47	27.56	67
1979:						
Jan.-Mar.--	3.97	7.80	51	19.78	31.18	63
Apr.-June--	3.86	8.39	46	19.26	33.63	57
July-Sept.-	3.75	9.35	40	18.35	32.91	56
Oct.-Dec.--	3.67	8.62	43	18.01	33.89	53
Annual----	3.81	8.54	45	18.85	32.90	57
1980:						
Jan.-Mar.--	4.03	8.60	47	20.25	33.73	60
Apr.-June--	4.01	8.80	46	20.23	32.91	61
July-Sept.-	3.94	9.70	41	20.35	34.46	59
Oct.-Dec.--	3.84	9.71	40	20.19	34.62	58
Annual----	3.96	9.21	43	20.26	33.93	60
1981:						
Jan.-Mar.--	n/a	11.05	-	n/a	36.65	-
Apr.-June--	n/a	10.78	-	n/a	36.46	-

Note: Annual simple averages are calculated for all years

n/a - not available

1/Weighted averages are used for the specified periods January 1972 - June 1975; simple averages are used thereafter.

2/Price reported for standard, finished hexagon nuts, bright, double chamfered, plain finish, 1/4"-20

3/Price reported for standard, finished hexagon nuts, bright, double chamfered, plain finish, 1/2"-13

Source: International Trade Commission Investigations TA-201-37 and TA-203-11

Table B--Bolts, nuts and large screws: Averages 1/ of lowest net selling prices received by U.S. producers and importers on sales of cap screws, 3/8"-16 x 1", to distributors, by specified periods, January 1972 - June 1981.

Cap Screws, 3/8" - 16 x 1"2/

(per 1,000 units)

Period	Average prices			Average prices		
	Import	Domestic	Import Ratio Percent	Import	Domestic	Import Ratio Percent
	Grade 2			Grade 8		
1972:						
Jan.-June--	$7.94	$10.80	74	$19.06	$25.15	76
July-Dec.--	8.04	11.05	73	n/a	24.84	-
Annual	7.99	10.93	73	n/a	25.00	-
1973						
Jan.-Mar.--	11.62	11.77	99	n/a	28.80	-
Apr.-June--	10.67	11.62	92	17.30	29.06	60
July-Sept.-	11.73	12.23	96	21.83	29.05	75
Oct.-Dec.--	14.28	12.52	114	29.13	29.01	100
Annual	12.08	12.04	100	22.75	29.04	78
1974:						
Jan.-Mar---	16.48	12.91	128	30.32	31.93	95
Apr.-June--	18.47	17.70	104	34.38	36.02	95
July-Sept.-	20.67	22.14	93	36.12	39.52	91
Oct.-Dec.--	18.28	22.92	80	33.67	42.40	79
Annual	18.48	18.92	98	33.62	37.47	90
1975:						
Jan.-Mar.--	15.82	25.41	62	28.67	40.40	71
Apr.-June--	15.55	24.53	63	23.13	40.67	57
July-Sept.-	15.64	22.86	64	26.12	30.50	86
Oct.-Dec.--	14.52	22.09	68	25.02	28.17	89
Annual	15.38	23.72	65	25.74	34.94	74
1976:						
Jan.-Mar.--	13.50	21.74	66	25.02	31.67	79
Apr.-June--	14.32	21.75	62	24.96	30.61	82
July-Sept.-	14.74	22.05	67	24.86	29.24	85
Oct.-Dec.--	14.50	21.88	66	24.72	30.91	80
Annual----	14.26	21.86	65	24.89	30.46	82
1977:						
Jan.-Mar.--	15.06	21.64	70	27.63	30.51	91
Apr.-June--	14.79	20.53	72	27.87	29.78	94
July-Sept.-	14.88	19.88	75	26.41	29.74	89
Oct.-Dec.--	14.99	19.85	76	27.12	30.35	89
Annual----	14.93	20.46	73	27.26	30.10	91
1978:						
Jan.-Mar.--	16.24	21.92	74	29.38	32.96	89
Apr.-June--	17.83	21.38	83	31.76	34.07	93
July-Sept.-	19.10	22.16	86	37.93	35.17	108
Oct.-Dec.--	19.85	23.13	86	38.16	36.74	104
Annual----	18.26	22.15	82	34.31	34.74	99
1979:						
Jan.-Mar.--	19.16	24.46	78	32.40	37.75	86
Apr.-June--	19.88	25.18	79	32.52	40.04	81
July-Sept.-	20.88	26.00	80	33.92	40.77	83
Oct.-Dec.--	20.60	26.17	79	30.78	39.11	79
Annual----	20.13	25.45	79	32.41	39.42	82
1980:						
Jan.-Mar.--	21.34	25.17	85	32.94	35.29	93
Apr.-June--	21.07	26.25	80	33.67	38.64	87
July-Sept.-	21.49	28.48	75	33.15	38.23	87
Oct.-Dec.--	21.26	28.07	76	30.59	39.75	77
Annual----	21.29	26.99	79	32.59	37.98	86
1981:						
Jan.-Mar.--	n/a	29.03	-	n/a	45.08	-
Apr.-June--	n/a	28.16	-	n/a	35.44	-

Note: Annual simple averages are calculated for all years.

1/Weighted averages are used for specified periods January 1972 - June 1975; simple averages are used thereafter.

2/Price reported for standard grade 2-8, 3/8"-16 x 1" hexhead cap screws with washer face, plain finish, UNC class 2A thread.

n/a Not available

Source: International Trade Commission Investigations TA-201-37 and TA-203-11

Table C--Bolts, nuts and large screws: Averages 1/ of lowest net selling prices received by U.S. producers and importers on sales of bolts to distributors, by specified periods, January 1972 - June 1981.

Period	Carriage Bolts, 3/8" x 3" 2/ (per 1,000 units)			High Strength Structural 3/ Bolts, A 325, with Nut, 3/4" x 2" (per 1,000 units)		
	Average prices			Average prices		
	Import	Domestic	Import Ratio	Import	Domestic	Import Ratio
			Percent			Percent
1972:						
Jan.-June--	$15.10	$26.80	56	$125.98	$164.80	76
July-Dec.--	19.12	26.89	71	144.61	162.32	89
Annual	17.11	26.85	64	135.30	163.56	83
1973:						
Jan.-Mar.--	18.41	27.64	67	157.05	176.62	89
Apr.-June--	25.84	26.91	96	176.48	185.92	95
July-Sept.-	27.74	28.09	99	247.00	186.02	133
Oct.-Dec.--	35.35	28.29	125	247.88	184.77	134
Annual	26.84	27.73	97	207.10	183.33	113
1974:						
Jan.-Mar---	33.83	29.28	116	259.37	217.21	119
Apr.-June--	46.66	31.26	149	284.17	258.42	110
July-Sept.-	41.17	39.20	105	344.27	342.06	101
Oct.-Dec.--	42.34	48.97	86	339.22	339.23	100
Annual	41.00	37.18	110	306.76	289.23	106
1975:						
Jan.-Mar.--	30.01	45.11	67	314.32	316.43	99
Apr.-June--	28.12	51.18	55	268.50	334.35	80
July-Sept.-	30.77	52.72	58	262.52	293.33	89
Oct.-Dec.--	32.23	51.96	62	237.34	290.28	82
Annual	30.28	50.24	60	270.67	308.60	88
1976:						
Jan.-Mar.--	31.21	49.46	63	238.95	289.66	82
Apr.-June--	32.32	48.78	66	239.13	308.26	78
July-Sept.-	32.94	50.55	65	238.62	293.23	81
Oct.-Dec.--	34.01	50.70	67	231.91	272.34	85
Annual----	32.62	49.87	65	237.15	290.87	82
1977:						
Jan.-Mar.--	36.14	47.78	76	232.33	281.75	82
Apr.-June--	35.09	45.99	76	230.17	282.92	81
July-Sept.-	35.37	43.57	81	243.65	283.11	86
Oct.-Dec.--	35.85	44.53	81	248.71	278.76	89
Annual----	35.61	45.47	78	238.72	281.64	85
1978:						
Jan.-Mar.--	38.47	44.68	86	275.18	299.46	92
Apr.-June--	41.86	45.90	91	306.03	314.20	97
July-Sept.-	44.75	44.64	100	333.29	324.04	103
Oct.-Dec.--	45.09	46.41	97	344.06	332.39	104
Annual----	42.54	45.41	94	314.64	317.52	99
1979:						
Jan.-Mar.--	44.79	51.43	87	319.07	333.07	96
Apr.-June--	45.31	52.14	87	311.48	353.04	88
July-Sept.-	46.57	52.04	89	338.06	356.38	95
Oct.-Dec.--	46.30	53.57	86	345.93	356.06	97
Annual----	45.74	52.54	87	328.64	349.64	94
1980:						
Jan.-Mar.--	51.47	54.30	95	358.07	352.85	101
Apr.-June--	52.12	54.30	96	354.64	359.19	99
July-Sept.-	51.02	63.99	80	358.29	349.60	102
Oct.-Dec.--	51.81	59.52	87	358.58	352.81	102
Annual----	51.61	58.04	89	357.40	353.61	101
1981:						
Jan.-Mar.--	n/a	53.83	-	n/a	373.73	-
Apr.-June--	n/a	55.42	-	n/a	349.24	-

Note: Annual simple averages are calculated for all years.

n/a not available.

1/Weighted averages are used for the specified periods January 1972 - June 1975; simple averages are used thereafter.

2/Price reported for standard, round head, square neck carriage bolts, full-size, black 3/8" x 3", less nut.

3/Price reported for standard, high-strength structural bolts, A325, with heavy hexagon head, washer faced and heavy hexagon nuts 3/4" x 2".

Source: International Trade Commission Investigations TA-201-37 and TA-203-11

Table D - Bolts, nuts and large screws: Averages of lowest net selling prices* received by U.S. producers of fasteners and distributors of foreign made fasteners to original equipment manufacturers and heavy construction contractors by specified period, July 1981 - June 1982.

Item	July-Sept. 1981 Average Dist.	Prices Prod.	Dist./ Prod. Ratio Percent	Oct.-Dec. 1981 Average Dist.	Prices Prod.	Dist./ Prod. Ratio Percent	Jan.-March 1982 Average Dist.	Prices Prod.	Dist./ Prod. Ratio Percent	April-June 1982 Average Dist.	Prices Prod.	Dist./ Prod. Ratio Percent
Grade 2, 3/8"-16 x 1" with washer face, plain finish, UNC Class 2A thread	25.08	28.16	89	23.23	27.36	85	23.53	25.18	93	25.59	25.16	102
Grade 5, 3/8"-16 x 1" cap screws with washer face, plain finish, UNC Class 2A thread	27.89	31.80	88	28.53	31.80	90	27.39	30.49	90	29.18	30.49	96
Grade 8, 3/8"-16 x 1 with washer face, plain finish, UNC Class 2A thread	33.45	35.44	94	33.36	n/a	-	30.18	n/a	-	29.38	n/a	-
Finished hexagon nuts, bright, double chamfered, plain finish, 1/2"-13	19.40	34.65	56	19.10	34.05	56	19.00	n/a	-	19.83	n/a	-
High strength structural bolts, A325, with heavy hexagon head, washer faced and heavy hexagon nuts, 3/4" x2"	381.63	384.45	99	373.23	384.45	97	369.35	361.15	102	352.17	349.50	101
Round head square neck carriage bolts, full size, black, 3/8"x3", less nut	52.93	55.42	96	53.02	53.64	99	51.76	51.89	100	48.54	51.89	94

*Distributor prices are weighted averages (adjusted). Producer prices are simple averages developed from April-June 1981 prices as reported by ITC and appearing in tables A, B, and C. High strength structural bolts reflects actual reported data.

n/a - not available

Source: Department of Commerce 232 Investigation (not all firms surveyed responded)

I. Financial Performance of the Industry

Through industry questionnaires, the ITC and the DOC have gathered financial data on the nuts, bolts and large screws industry for various periods from 1972 - June 1982. Because an unequal number of firms responded to the two questionnaires, some of the information collected is not directly comparable. However, overall trends in the industry's financial picture can be determined from a review of the data.

In 1978, the ITC reported to the President on the profitability of nut, bolt and large screw producers for the years 1972 through 1977 (Investigation No. TA-201-37. USITC Publication 924, November 1978.) Forty-one producers responded to the ITC's questionnaires for the years 1972-1976. Thirty-five producers responded for the year 1977. The industry's average ratio of net operating profit to net sales rose from 5.4 percent in 1972 to a high of 17.1 percent in 1974, an especially successful year for sales of special nuts, bolts and large screws. The combination of large price increases, increased sales and higher profit margins for these items caused the average ratio of net operating profit to net sales to peak. The ratio declined between 1975 and 1977 along with sales of special and standard nuts, bolts and screws.

PROFITABILITY OF PRODUCERS
(In percent)

Product	1972	1973	1974	1975	1976	1977
Bolts, nuts and large screws	5.4	9.4	17.1	14.7	11.4	7.6
Fabricated metal products	6.5	7.3	7.9	7.4	8.3	8.2
All manufacturing	7.5	8.0	8.7	7.5	8.7	8.7

Source: USITC Publication 924, November 1978.

The ITC sampled the industry again in 1981 for the 1978 - June 1981 period (Report to the President on Investigation No. TA-203-11. USITC Publication 1193, November 1981). The ITC's sampling covering financial data from 29 domestic producers indicated that the ratio

of net operating profit to net sales climbed from 10.5 percent in 1978 to 12.0 percent in 1979, which, like 1974, was an especially good year for sales, particularly sales of the highly profitable special fasteners. As sales of specials and standards receded in 1980, the average ratio of net operating profit to net sales dropped to 8.2 percent. As shown in the table below, the fluctuations in the profit ratio for U.S. producers of nuts, bolts and large screws are more extreme than those for producers of fabricated metal products and all manufacturing corporations.

PROFITABILITY OF PRODUCERS
(In percent)

Item	1978	1979	1980	Jan-June 1981
Bolts, nuts and large screws	10.5	12.0	8.2	9.2
Fabricated metal products	7.4	7.2	6.1	6.5
All manufacturing	7.8	7.6	6.4	6.4

Source: USITC Publication 1193, November 1981.

The Department of Commerce surveyed the industry for the current Section 232 investigation. Financial data from 88 percent of the industry showed that the ratio of net profits to net sales declined between July 1981 and June 1982. As of July-September 1981 the ratio of net profits to sales was 6.3 percent. As of April-June 1982 the ratio had declined to only 1.4 percent. The declining profitability ratio is tied to a downturn in sales of fasteners, particularly the more profitable specials. Net sales for the nuts, bolts and large screws industry as a whole declined from $273 million in the third quarter of 1981 to $233 million in the second quarter of 1982, a 15 percent drop reflecting the overall economic downturn. Of the firms responding to DOC's questionnaire, 24 percent reported losses in the third quarter 1981 compared with 56 percent reporting losses in the second quarter 1982. The average profitability ratio for the one year period (July 1981 - June 1982) was 3.1 percent, the lowest recorded in the 1972 - June 1982 period. As the following table shows, profitability for the nuts, bolts and large screws industry since July 1981 has been poor relative to profitability for the fabricated metal products industry and for all manufacturing.

Profitability of Producers
(In percent)*

Item	3rd Qtr. 1981	4th Qtr. 1981	1st Qtr. 1982	2nd Qtr. 1982
Bolts, nuts and large screws	6.3	1.9	2.2	1.4
Fabricated metal products	7.1	5.1	5.4	5.5
All manufacturing	7.4	6.4	5.8	5.9

Sources: Compiled from data submitted in response to questionnaires of the U.S. Department of Commerce (Section 232 investigation) and DOC's Quarterly Financial Report for Manufacturing, Mining & Trade Corporations.

Capital Expenditures and Research & Development Expenditures by the Domestic Fastener Industry.

An examination of the ratios of capital expenditures to net sales over time indicates that the ratio in the July 1981 - June 1982 period declined to its lowest level since 1974. The ratio of capital expenditures to net sales was 3.0 percent for the most recent period as compared with 4.8 percent in 1980 and 2.9 percent in 1974. Approximately 90 percent of the capital expenditures in the July 1981 - June 1982 period was for machinery, equipment and fixtures. It is estimated that about 73 percent of the machinery investments would be used to produce special nuts, bolts and large screws and 27 percent to produce standard fasteners.

Ratio of Capital Expenditures to Net Sales

Year	Percent
1972	2.5
1973	5.5
1974	2.9
1975	3.6
1976	4.6
1977	5.5
1978	4.4
1979	3.8
1980	4.8
July 81- June 82	3.0

Sources: USITC Publication 924, November 1978; USITC Publication 1193, November 1981 and Department of Commerce 232 investigation.

Expenditures for research and development during the July 1981 June 1982 period reached almost $6.7 million, considerably greater than the $1.8 million reported by the ITC for 1980.

J. Distribution

There are an estimated 5,000-6,000 distributors of nuts, bolts and large screws of iron or steel in the United States with approximately 30,000-35,000 employees. Relatively few of these distributors deal only in fasteners, and none distributes only the investigated items. The distributors are, however, all identified by the Bureau of the Census wholesale trade number (SIC) 5072 - Hardware, which the Department of Labor reports employs 84,000 workers and includes 7,000 establishments. Other items such as hand tools, shovels, brads, locks and shelf (or light) hardware items, etc., as well as fastener items (identified in SIC 3452, see Appendix H) are classified in SIC 5072. Iron and steel fasteners are thought to comprise about 30-35 percent of the SIC 5072 trade totals.

The distributors' share of the domestic market for the investigated products has increased from 35-40 percent in 1970 to about 60 percent in 1982, primarily because of increased imports. About 90 percent of imports and 20 percent of domestic production are channelled through distributors. Estimated distributor sales were $3.25 billion in 1981. Most of these fasteners are standards. About 50-60 percent of distributor sales are to OEMs, the remainder go to the hardware and general use markets. Although lead times and quality are important, distributors' compete with domestic manufacturers for these markets almost totally on the basis of price. The distributors' average mark-up, according to industry sources, is about 50 percent, compared to a 40 percent mark-up cited by domestic manufacturers.

Most distributors (over 93 percent) are single establishments with limited inventories that serve local markets. They are concentrated in industrial and population centers. The few larger firms have multiple locations scattered regionally (or nationally). They stock up to 55,000-60,000 items, provide plating and rework services, and offer technical and consultative guidance to their customers.

III. CAPACITY AND CAPACITY UTILIZATION
(See Table at end of Section III)

At the end of 1982 U.S. capacity to produce nuts, bolts and large screws of iron and steel was estimated to be 1,778.6 million pounds, up slightly from 1,755.4 million pounds at the end of June 1982. Overall, fastener capacity has declined 21.5 percent since 1978 when it was at an all-time high of 2,265.7 million pounds. Capacity utilization, however, has remained below 40 percent since the second half of 1981.

Nut production capacity has declined 37.8 percent from its 1976 high of 538 million pounds to 334.7 million pounds at the end of 1982. Of this decline, 28 percent occurred in 1981 alone. The capacity to produce standard and special type nuts was estimated at 195 million pounds and 139.7 million pounds, respectively, at the end of 1982.

Beginning in 1975, capacity utilization rates for nuts fell from 66-71 percent in prior years to about 40 percent where they remained until 1979, when rates climbed to 50 percent. Utilization rates of nut capacity were 33 percent in 1980, 41 percent in 1981 and 36.1 percent during the first half of 1982.

Bolts and large screws capacity declined 17.7 percent from its 1978 high of 1,754.3 million pounds to 1,443.8 million pounds at year-end 1982. This decline was more evenly spread than the 1981 drop in nut capacity. Capacity declined 6.3 percent between 1978 and 1980, 8.3 percent in 1981; and, 4.2 percent in 1982. The capacity at the end of 1982 to produce standard and special type bolts and large screws was estimated at 661.9 million pounds and 781.9 million pounds, respectively.

Capacity utilization rates for bolts and large screws were over 70 percent in 1972-1974, fell to 56 percent in 1975, then remained in the 50-60 percent range until 1979 when it reached 61 percent. After 1979, capacity utilization dipped below 50 percent and, since the second half of 1981, has been around 35-40 percent.

Capacity data in units (pieces) for selected years are shown in the following table.

Average Pieces Per Pound In Reported Domestic Nut, Bolt and Large Screw Capacity

	Bolts and Large Screws	Nuts
1972	11.23	19.57
1978	13.13	23.46
1980	13.24	23.03
1982	13.35	22.78

Source: Department of Commerce 232 Investigation

These data demonstrate that the bolts and large screws produced in the U.S. are decreasing in size. This supports the report that fastener users, and particularly the automotive industry, are moving toward lighter, smaller bolts and screws. Nuts, on the other hand, are lightweight to begin with. Imports, have been concentrated in the smaller sizes.

Current economic conditions and increased imports of lower priced high volume type standards have caused the decline in utilization rates for the U.S. industrial fastener industry. The decline is related to the domestic shift into specials production which first became apparent in 1975. Specials, which are typically produced in shorter runs than standards, require more frequent machine and equipment "set-ups"* and often longer set-up times.

In 1979, the domestic industry operated at only 58 percent of capacity. Despite this, the industry's profits and sales increased that year in response to strong demand, rising prices and tariff relief. For this reason, capacity utilization statistics are to be used with some caution in assessing the health of the industry. The ITC reported that the upper practical limit for capacity utilization for this industry in peacetime is approximately 75 percent due to greater concentration in specials, difficulties in scheduling production runs and downtime between orders. (See USITC Publication 1193, November 1981 at A-19.)

Utilization rates fell by over 29 percent in 1980 from 1979 levels, rose slightly in 1981 and then plummented to only 36 percent in 1982 (almost a 38 percent drop from 1979). Apparent consumption over the same period fell 24 percent in 1980, dropped a bit more in 1981 and collapsed by nearly 37 percent (from 1979) to an annualized rate of only 1.35 billion pounds in 1982. However, since capacity also dropped by 20.5 percent from 1979 to 1982, slightly more than half the decline in utilization rates is attributable to imports (20.5 divided by 38) and the remainder is attributable to current economic conditions.

*/The term "set-up" is used by the industry to describe the changes and modifications that must be made on a machine and secondary equipment when switching from the production of one fastener to that of another. Set-ups commonly take 4-8 hours. They can take as little as one-half hour or as long as four or five 8-hour shifts.

The domestic industry has been criticized by a number of trade sources and in the New England Research Application Center (NERAC)* study for having a great deal of older and outmoded machinery which is on the lower end of the speed scale and less efficient than newer models. The older equipment also breaks down more frequently, further lowering utilization rates. However, there appears to be a more progressive generation of fastener establishments emerging that are investing in the newest equipment and technology and successfully competing (despite higher material costs) against offshore firms. These firms (numbering 20-25) are smaller and more specialized and exercise tighter and closer management control than their older and larger competitors. It is likely that in the next economic expansion more of these firms will emerge.

*/Final Report on Industrial Fastener Study, Technology Advancement Task, conducted by Precision Engineering Systems, Inc., for The New England Research Application Center (NERAC). Submitted to the Department of Commerce, 1982, pp. 11-12.

Nuts, Bolts, and Large Screws of Iron and Steel Production,
Capacity* and Capacity Utilization in Million Pounds

		ITC-201-37						ITC-203-11			DOC-232	
		1972	1973	1974	1975	1976	1977	1978[1]	1979[1]	1980[1]	1981[2]	1982[2]
Bolts	Production							740	767	524	458	324
	Capacity	n/a	n/a	n/a	n/a	n/a	n/a	1203	1216	1199	1028	1012
	% Capacity Utilization							61	63	44	45	32
Large Screws	Production							247	294	196	195	193
	Capacity	n/a	n/a	n/a	n/a	n/a	n/a	543	516	439	477	428
	% Capacity Utilization							46	57	45	41	45
Lag Screws	Production							2.49	3.03	2.33	1.44	1.00
	Capacity	n/a	n/a	n/a	n/a	n/a	n/a	8.4	8.06	7.11	2.99	3.66
	% Capacity Utilization							30	38	33	48	27
Total: Bolts Large Screws and Lag Screws	Production	1113	1146	1241	846	910	931	990	1064	723	654	518
	Capacity	1569	1481	1545	1553	1651	1598	1754	1740	1644	1508	1444
	% Capacity Utilization	71	77	80	56	55	58	56	61	44	43	36
Nuts	Production	312	280	317	205	214	207	200	244	157	145	121
	Capacity	442	427	475	513	538	533	511	499	489	352	335
	% Capacity Utilization	71	66	67	40	40	39	40	50	33	41	36
Combined Total	Production	1425	1426	1558	1069	1124	1138	1190	1309	880	799	639
	Capacity	2011	1910	2020	2066	2189	2131	2266	2239	2133	1860	1779
	% Capacity Utilization	71	75	77	52	51	53	53	58	41	43	36

* Practical Rated Capacity is defined as the normal sustained production that can be achieved on an annual basis based on average product mix and making allowance for anticipated maintenance downtime.

n/a not available

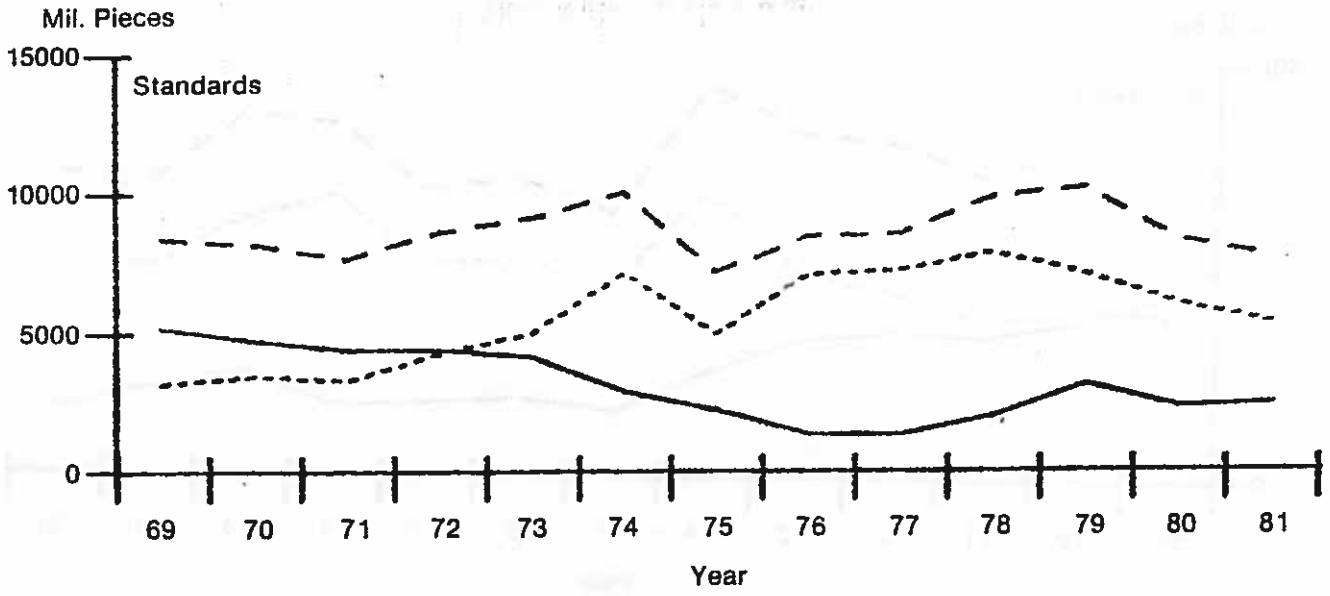
Items might not add to totals because of rounding.

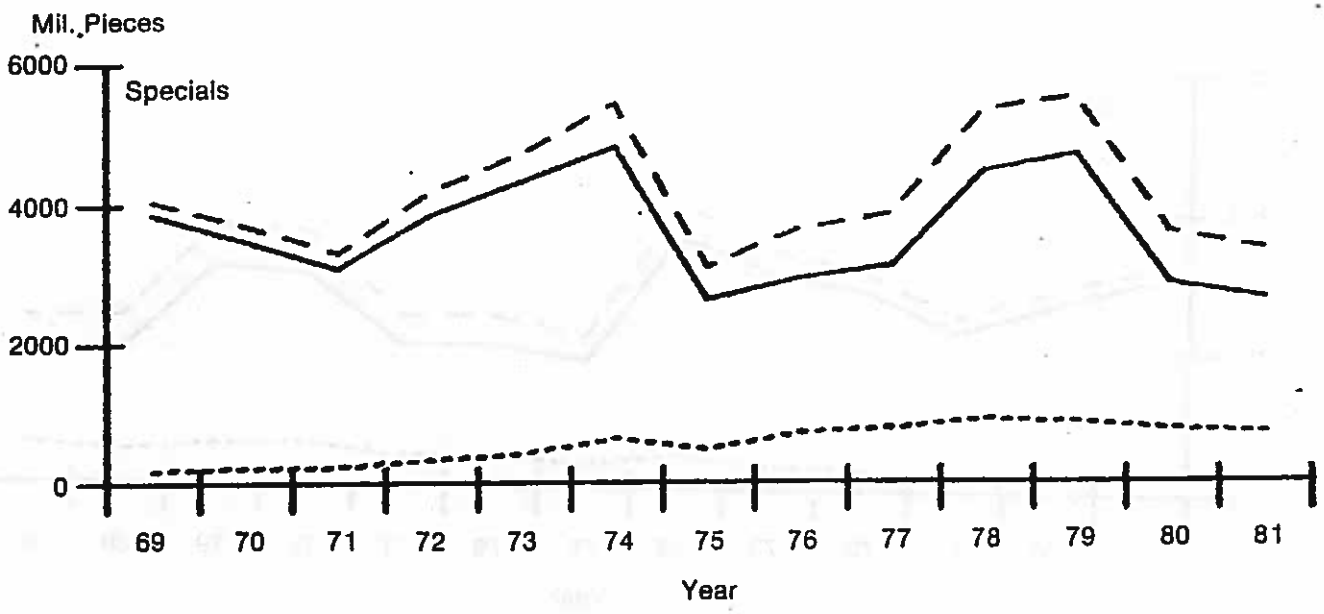
1 Data was converted to 100% from the estimated 70% of actual as reported in the ITC-203-11 Investigation.

2 Data was converted to 100% from the estimated 90% of actual as reported in the Commerce survey of the industry. The first six months 1981 production data was estimated from ITC reported data in the manner indicated by footnote no. 1 and combined with the final six months 1981 production data estimated from reported capacity utilization data. 1982 production data was annualized and was estimated from capacity utilization rates for the first half of 1982 which were reported in the same survey.

Source: International Trade Commission Investigations: No. TA-201-37 of 1978 and No. TA-203-11 of 1981, and Department of Commerce 232 Investigation

Figures 9 & 10 — Bolts and Large Screws — Standards and Specials*

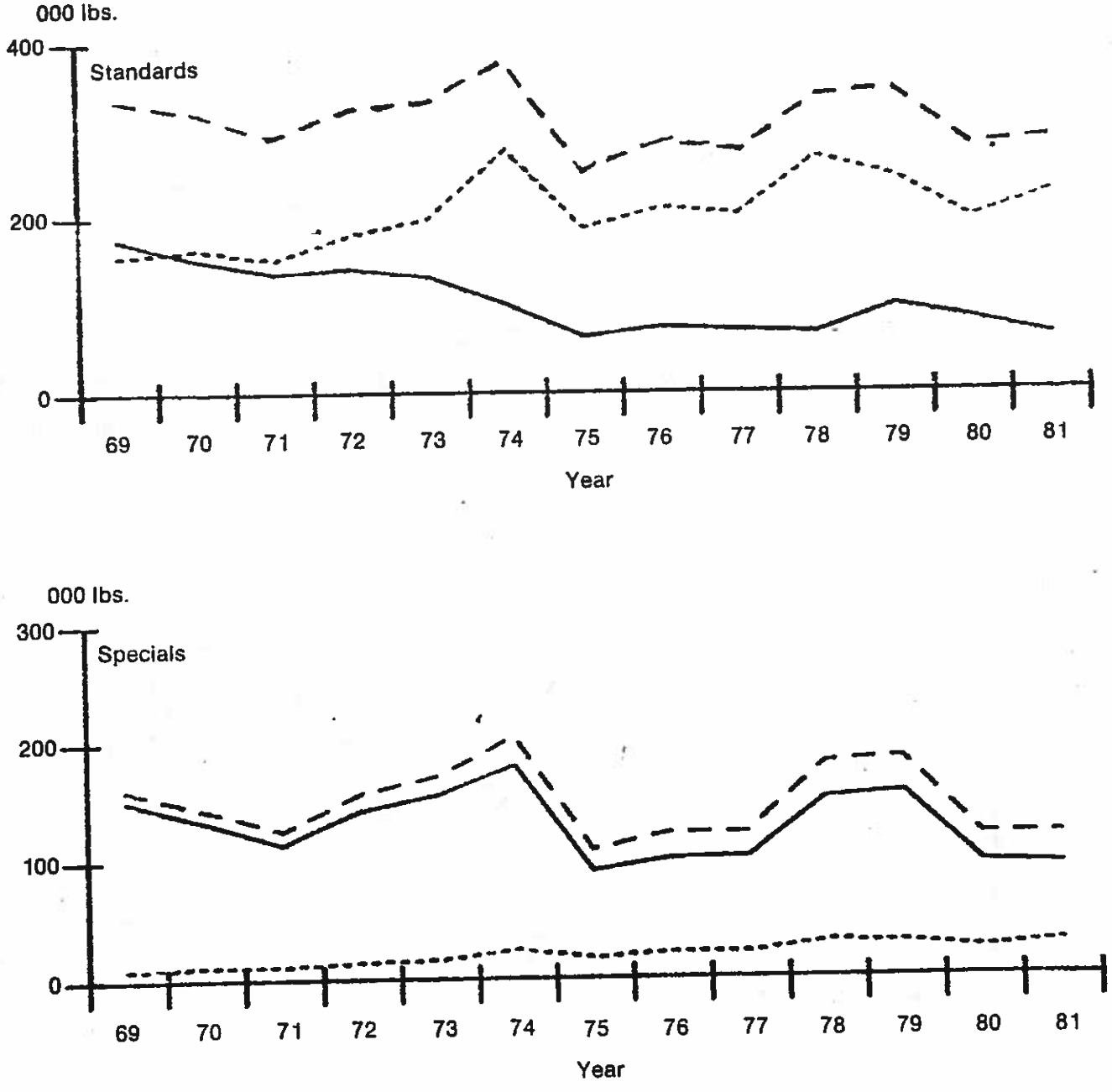




U.S. Apparent Consumption
Domestic Shipments
Imports

*Figures based on data shown in table 7. See Appendix.

Figures 11 & 12 — Nuts — Standards and Specials*



*Figures based on data shown in table 8. See Appendix.

IV. Producers' Shipments, Imports, U.S. Apparent Consumption and Exports*

U.S. producers' shipments, imports, U.S. apparent consumption and exports for the period 1969 - June 30, 1982, were reviewed to assess the domestic industry's continued ability to satisfy emergency requirements for nuts, bolts and large screws.

Summary

With demand for nuts, bolts and large screws very strong in the 1978-1979 period, producers' shipments, U.S. apparent consumption, imports and exports reached record or near-record levels. A downturn in markets and a changing trade picture have since caused these industry barometers to drop.

The nut sector of the industry has been particularly hard hit in recent years. While the ratio of producers' shipments of nuts to U.S. apparent consumption slumped to 45.2 percent (based on pounds) and 33.3 percent (based on pieces) in 1981, the ratio for bolts and large screws was somewhat stronger: 72 percent (based on pounds) and 63.5 percent (based on pieces).

Imports have penetrated the nut market to a greater extent than the bolts and large screws market. As of 1981 imported nuts represented 62 percent (based on pounds) and 66.6 percent (based on pieces) of U.S. apparent consumption. This compares with 39 percent and 54.4 percent, respectively, for the bolts and large screws sector. Import penetration of the standard nut market, in addition, has been greater than that in the standard bolts and large screws market. Whereas imported standard nuts accounted for 78.3 percent (based on pounds) and 84.2 percent (based on pieces) of standard nut apparent consumption in 1981, imported bolts and large screws represented 49.3 percent and 68.8 percent, respectively, of standard bolts and large screws consumption.

*/ Industry data were developed from responses received from 58 domestic producers and 31 importers surveyed for this investigation and considered to represent about 90 percent of the industry. (The nut, bolt and large screw segment of SIC 3452, industrial fasteners is discussed in Appendix H.)

A. Industry Overview

U.S. Producers' Shipments - (See Tables 1 and 2)

The 1969- June 1982 period was characterized by fluctuations in U.S. producers' shipments.* Shipments declined from 1.49 billion pounds in 1969 to 1.25 billion pounds in 1971 before increasing to 1.55 billion pounds in 1974, the end of a period described by panic buying. With a significant drop in demand and the need to cut record-level inventories, shipments, not surprisingly, fell to a low of 1.05 billion pounds in 1975. As the automotive and capital equipment markets strengthened in 1977-78, shipments expanded. Shipments in 1979 approached 1974 levels before dropping precipitously. A downturn in the automotive market; sluggish activity in most capital equipment markets; poor performance by the construction industry; and increased imports caused shipments to contract. In 1981 producers shipped only .965 billion pounds of nuts, bolts and large screws, a thirteen year low. Shipments continued to recede in the first half of 1982, as they declined 27 percent from the shipments recorded during the corresponding period of 1981.

Imports -

Imports of nuts, bolts and large screws rose from 372 million pounds in 1969 to 849 million pounds in 1978. With steel being cheaper abroad, foreign concerns can produce fasteners less expensively than U.S. firms, and for standard fasteners, price is the main factor in purchasers' preference. Increased import duties between January 1979 and January 1982 and a contracting domestic market caused imports to decline during this period.

By 1981, imports had declined to 677 million pounds. With the cessation of increased duties, imports rose 13 percent in January-June 1982 over January-June 1981 levels. Japan, Taiwan and Canada accounted for at least 80 percent of U.S. imports (pounds and value) since 1978. Other countries exporting to the U.S. include India, West Germany, Spain, The Netherlands, Italy and the United Kingdom.

U.S. Apparent Consumption -

In the thirteen and a half year period reviewed, more nuts, bolts and large screws were consumed in 1974 (2.17 billion pounds) than in any other year. Demand for steel products (mostly durables) skyrocketed in 1973-4 due to economic recovery and continued price controls on iron and steel. This pulled fastener demand to an all

*/U.S. producers' shipments include U.S.-made bolts, nuts and large screws that are shipped to domestic customers, exported or transferred within the company for use in the manufacture of other products.

time high. When price controls were removed on iron and steel in April 1974, prices of durables rose quickly, and demandcontracted. This coupled with the recession of 1975 caused demand for fasteners to fall sharply. In 1975, only 1.4 billion pounds were consumed, a low for the thirteen year period. During the more recent recession in 1981, 1.5 billion pounds were consumed, 15 percent less than the 1.77 billion pounds consumed in 1969.

The ratio of imported nuts, bolts and large screws to U.S. apparent consumption (based on pounds) rose to a high of 53.7 percent in the January-June 1982 period. This compares with 40.8 percent in the January-June 1981 period and 45.3 percent for 1981.

U.S. producers' shipments of nuts, bolts and large screws as a percent of apparent consumption (based on pounds) declined from 84.3 percent in 1969 to 60.3 percent in January-June 1982. The ratio declined fairly steadily over the years.

Exports -

Exports of nuts, bolts and large screws climbed to 218 million pounds in 1977. With the strengthening of the dollar and the weakening of foreign markets, exports dropped to 120 million pounds in 1980, a 45 percent decline. Exports expanded somewhat in 1981 to 148 million pounds. Exports in the first half of 1982 were slightly greater than those in the corresponding period of 1981.

Between 1969 and 1981 exports represented at most 18.6 percent (1977) of U.S. producers' shipments (based on pounds). In January-June 1982 exports as a percent of U.S. shipments reached a high of 23.2 percent, up 6.3 percentage points from the January-June 1981 period. One of the most important destinations for U.S. fastener exports is the Canadian operations of U.S. automobile companies. Although the leading export market is Canada, industrial fasteners are shipped to scores of other countries. The majority of U.S. exports of nuts, bolts and large screws are specials.

B. Bolts and Large Screws (TSUS 646.4920; 646.5400; 646.6320; 646.6340) (See Table 4 and Figure 1)

U.S. producers' shipments of bolts and large screws have been uneven since 1969. After falling initially from the 1969 level of 1.15 billion pounds, shipments by 1974 had recovered to a record level 1.242 billion pounds. Another drop occurred before shipments rebounded to 1.236 billion pounds in 1979. The thirteen year low came in 1981 when only .861 billion pounds were shipped. The level of shipments continued to decrease in the first half of 1982, running at only 73 percent the level reported in the first half of 1981.

Imported bolts and large screws climbed to record levels in 1978, 551 million pounds. Since then, the durable goods market and the construction industry have faltered with imports and producer shipments both contracting. Imports in 1981 declined to 422 million pounds, increasing 15.6 percent in the first half of 1982 from the corresponding period of 1981.

Figure 1 — Bolts and Large Screws*

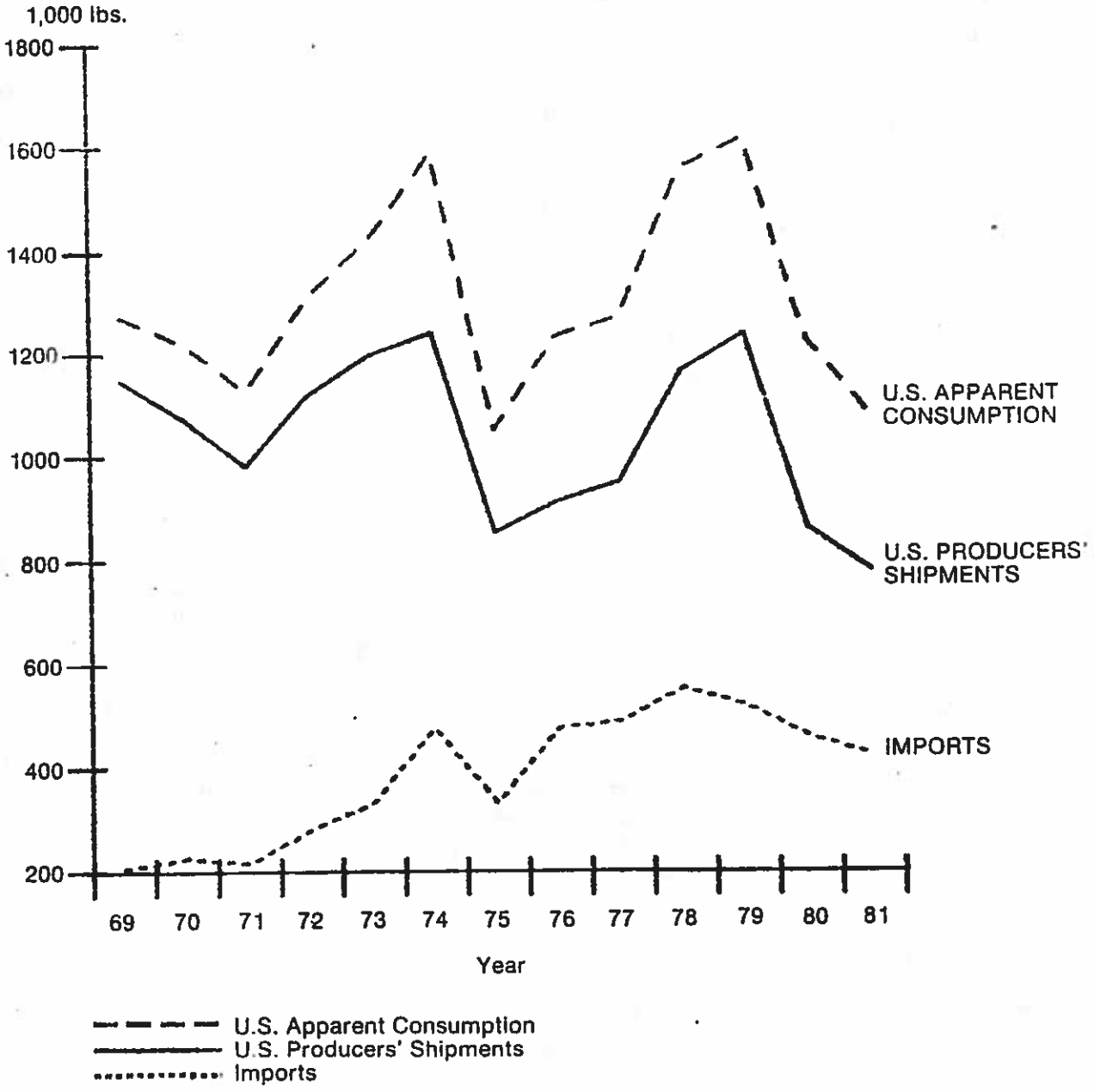


*Figure based on data shown in table 4. See Appendix.

Strong demand pushed U.S. apparent consumption of bolts and large screws to especially high levels in 1979 (1.61 billion pounds). Consumption in 1980 (1.22 billion pounds) and 1981 (1.08 billion pounds) was lower than in 1969 (1.27 billion pounds), however.

Imported bolts and large screws as a percent of apparent consumption (based on pounds) reached a high of 48 percent in the first half of 1982, compared with 33.8 percent in the same period of 1981. In 1981 the ratio was 39.0 percent, a record for the thirteen year period.

The ratio of producers' shipments of bolts and large screws to U.S. apparent consumption (based on pounds) declined from a high of 90.2 percent in 1969 to a low of 68.7 percent in January-June 1982. The latter figure compares with 76.3 percent in January-June 1981. The ratio ranged from 70.3 percent to 76.7 percent between 1976 and 1981.

Exports of bolts and large screws more than doubled between 1969 and 1977. Exports grew from 81.9 million pounds to a high of 166.2 million pounds (1977). Exports dropped to 94.2 million pounds in 1980 before expanding in the past year and a half.

Exports of bolts and large screws as a percent of U.S. producers' shipments (based on weight) reached a high of 17.5 percent (1977) in the 1969-1981 period. The percentage declined to 10.9 in 1980 before expanding to 15.3 percent in 1981, a year in which domestic shipments declined.

C. Imports of Bolts, Lag Screws or Bolts, and Cap Screws and Other Screws Having Shanks or Threads Over .24 inch in diameter (See Table 1)

1. Bolts (TSUS 646.5400)

Imports of bolts grew from 123 million pounds in 1969 to 238 million pounds in 1978, an increase of 93 percent. Imports declined to 146 million pounds in 1981, representing 21.6 percent (based on pounds) of imported nuts, bolts, and large screws, but increased in the first half of 1982 from the corresponding period of 1981.

Encouraging the growth of imports of bolts up to 1978 was the price differential between imported and domestic standard carriage bolts and high strength structural bolts, two significant bolt products. In 1975 the price of imported carriage bolts (3/8 inch x 3 inch) was 60 percent that of similar domestic bolts. The price of imported high strength structural bolts with nuts (3/4" x 2") was 82 percent that of the domestic bolts in 1976. By 1980 the price gap had narrowed. Imports by then carried a price 90 and 101 percent, respectively, of that of the domestics', and were consequently less attractive to U.S. purchasers. (See Table C)

Japan and Canada have traditionally been the largest exporters of bolts to the U.S. in terms of both pounds and value. India and Taiwan have also been strong the U.S. bolt market in recent years.

2. Lag Screws or Bolts (TSUS 646.4920)

Imported lag screws or bolts, which comprise less than three percent of imported nuts, bolts and large screws (based on weight) reached a record 20.3 million pounds in 1981, up 1.6 percent from the previously recorded high of 20.0 million pounds in 1973. Imports declined, however, in the first half of 1982 from the first half of 1981 (See Table 1).

Historically, lag screws from Japan have comprised more than 90 percent (pounds and value) of this country's supply of imported lag screws. Taiwan, however, has made steady gains in this market, to Japan's detriment. Imports of lag screws from Taiwan moved from 2.8 percent of lag screw imports in 1978 to 19 percent to 1981.

3. Cap Screws Greater than .24 inch in diameter (TSUS 646.6320)

Imports of cap screws greater than .24 inch in diameter increased to 292 million pounds in 1979, more than five times 1969 imports of 54 million pounds. Imports dropped off to 240 million pounds or 35.5 percent of imported nuts, bolts and large screws, in 1981.

One factor encouraging such imports is the dual nature of cap screws. Cap screws can be used in traditional ways or, as is becoming more common, instead of bolts. Cap screws require less labor to install than bolts in similar applications.

As in the case of standard carriage bolts and high strength structural bolts, a price differential exists between imported and domestic cap screws (3/8 inch - 16 x 1 inch). This differential has generally favored the imports. In 1975, imported cap screws (grade 2) were priced at about 65 percent that of domestics. In 1980, the price of such imports was 79 percent that of domestics. The prices of imported cap screws (grade 8) ranged from 51 percent (1976) to 74 percent (1975) in the 1975-1980 period. (See Table B, pp 23)

Japan and Canada are the leading exporters of cap screws to the U.S. However, Taiwan is gradually enlarging its share of the U.S. market. In 1979, for example, Taiwanese cap screws totalled 1.6 percent of U.S. imports. By 1981, Taiwan's share had increased to 11.6 percent.

4. Other Screws Greater than .24 inch in diameter (TSUS 646.6340)

The quantity of imported "other screws" has fallen substantially since 1974. No more than 17 million pounds have been imported in the past seven years, less than what was imported between 1969 and

1974. Imported other screws accounted for 2.2 percent (in weight) of imported nuts, bolts and screws in 1981. Japan, Taiwan and Canada are the chief exporters of other screws greater than .24 inch in diameter to the U.S.

D. Nuts (TSUS 646.5600) (See Table 4 and Figure 2)

Parallelling the ups and downs of the overall fastener industry, U.S. producers' shipments of nuts fluctuated throughout the 1969 - June 1982 period. The years 1974 and 1979 were exceptionally strong years, with 1981 representing a low for the thirteen year period (.187 million pounds). Shipments continued to decline in the first half of 1982, dropping 29 percent from the corresponding period of 1981.

Imported nuts reached record levels in 1974, a year of panic buying and shortages. Imports in 1981 which represented 37.3 percent of all imports, were 15-18 percent less than peak levels (based on weight in pounds).

Japan and Taiwan are strong competitors in the U.S. nut market. Japan's share (by quantity) declined from 54.7 percent in 1978 to 39.7 percent in 1981. Taiwan, in contrast, raised its share from 24.3 percent to 42 percent during this four-year period. Because Taiwanese nuts are priced below their Japanese competition, Taiwan's share in 1981, by value, was noticeably less.

U.S. apparent consumption of nuts crested in 1974 at 582 million pounds. In 1981 consumption was 413 million pounds, 16 percent less than consumption in 1969.

Imports make up a greater share of U.S. consumption in the case of nuts than in the case of bolts and large screws. Whereas imported nuts accounted for 62 percent (a high) of consumption in 1981, imported bolts and large screws represented 39 percent (also a high) of consumption during the same year. Imported nuts continued to mount in January-June 1982, showing a 68.5 percent share of consumption.

As long as their diameters and threads match, a nut can mate with screws and bolts of numerous lengths and head styles. Nuts can therefore be manufactured in larger volumes in specific diameters, and foreign firms reduce their risks by having a broader market in which to sell. The mass of nuts imported into this country has, consequently, penetrated the market to a greater extent than imported bolts and large screws which, because of their greater variety, are produced in smaller volumes.

Considerable price differences exist between imported and domestic standard hexagon nuts. (See Table A). In 1980, the most recent year for which complete data are available, prices of imports were 40 and 60 percent that of domestics. Price differentials have undoubtedly encouraged increased consumption of imported nuts.

Figure 2 — Nuts*

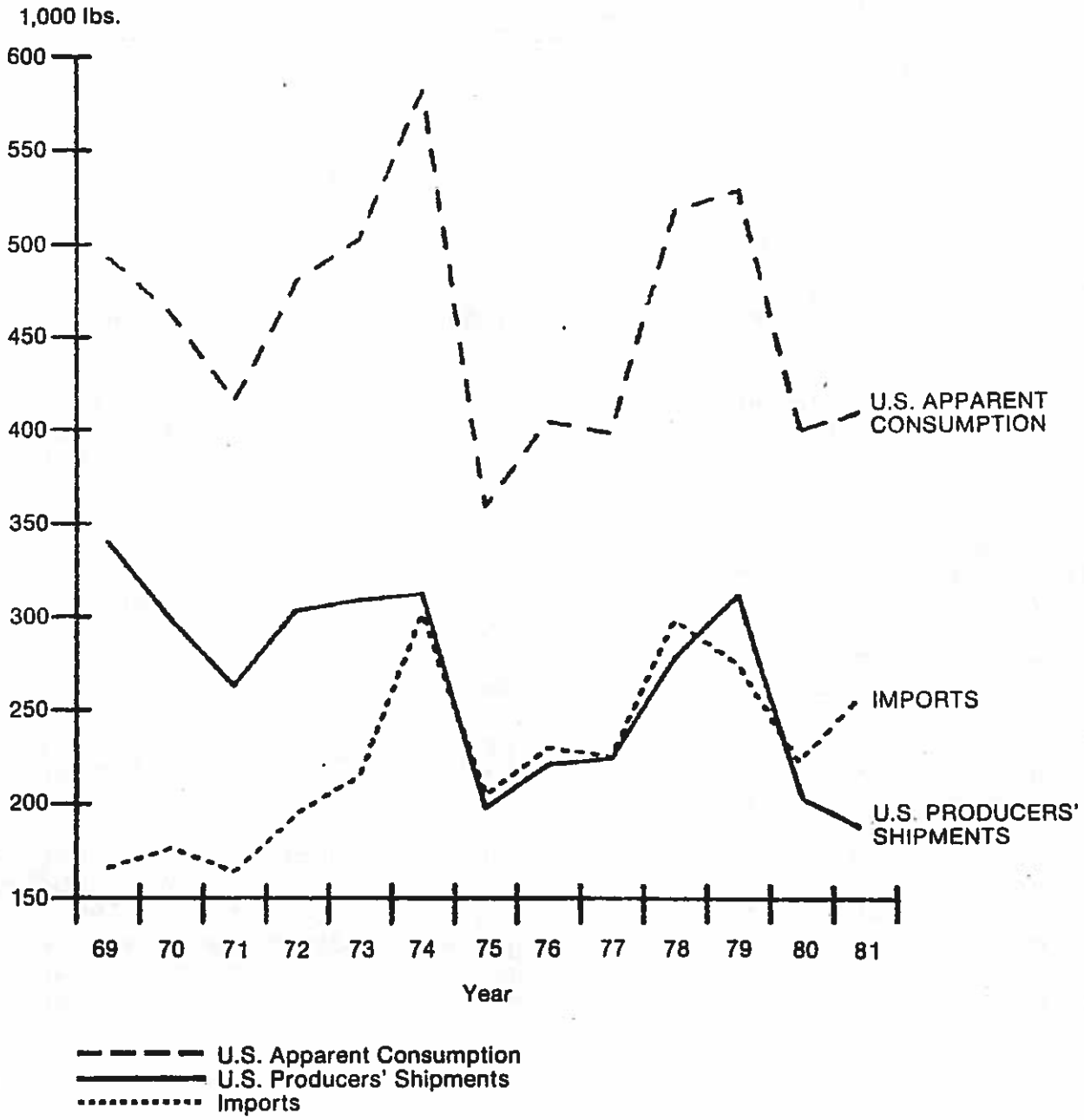


*Figure based on data shown in table 4. See Appendix.

The ratio of producers' shipments of nuts to U.S. apparent consumption (based on pounds) declined from a high of 69.1 percent in 1969 to a low of 39.1 percent in January-June 1982. The January-June 1982 ratio is some 11 percentage points lower than the January-June 1981 ratio. Producers' shipments represented 45.2 percent of U.S. apparent consumption in 1981, the last full year for which data is available.

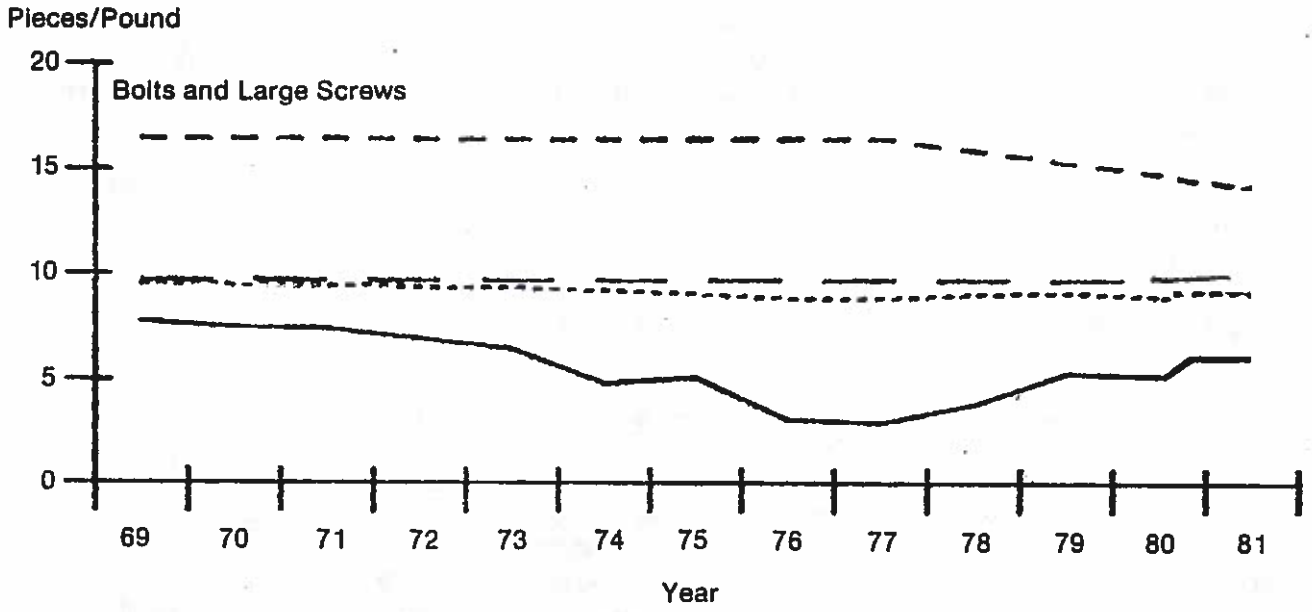
Exports of nuts increased from 13 million pounds in 1969 to 58 million in 1978. Exports dropped to 30 million pounds in 1981, less than what was exported in 1974. The ratio of exports to producers' shipments (weight) to be to 23.2 percent in 1977 (13-year high) and declined to 15.9 percent in 1981. In January-June 1982, the ratio was 19.4 percent.

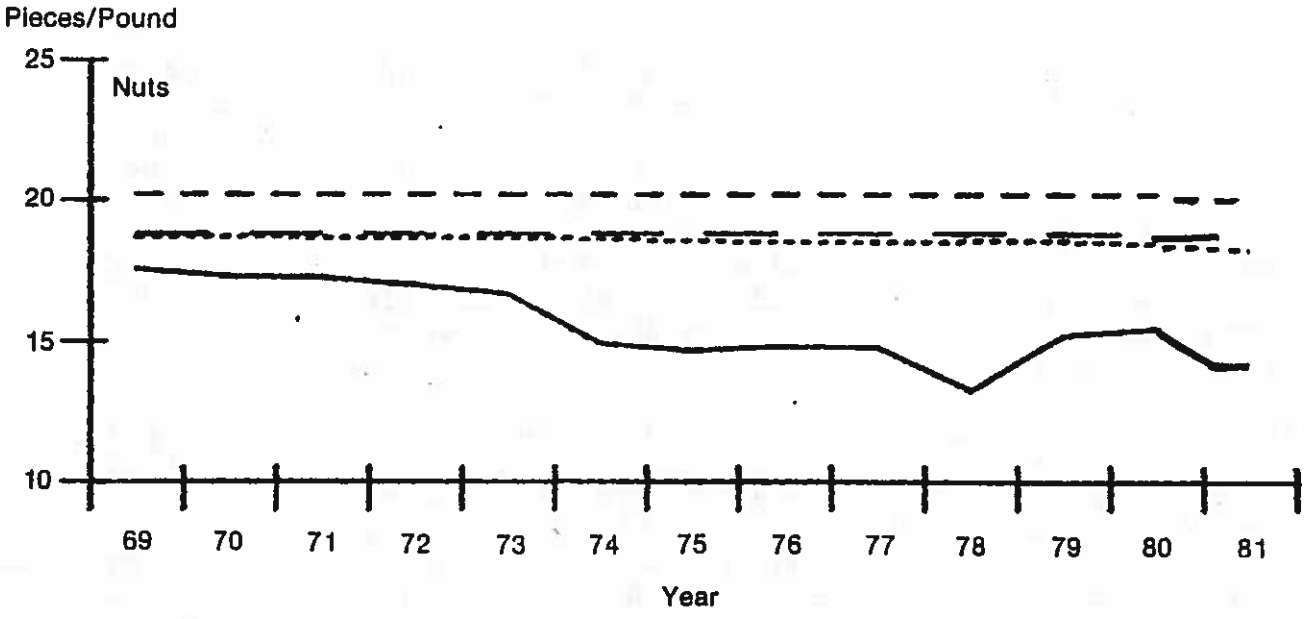
E. Pieces Per Pound (See Table 4 and 6, and Figures 1-6)

Imported fasteners are typically small in diameter, length and weight, although their average size has increased somewhat in recent years. In 1969 there were approximately 16.4 pieces of imported bolts and large screws per pound. (See Figure 3) By January-June 1982, the average number of pieces per pound had declined to an estimated 13.9, confirming that imported fasteners have increased in size. As imported bolts and large screws were concentrated in the smaller sizes, U.S. fastener producers were largely displaced from the 1/4 inch - 1/2 inch standard fastener range. The remaining standard domestic bolts and large screws were larger and heavier. In 1969, there were about 7.8 pieces of domestic standards per pound. By 1977, there was an average of only 3.0 pieces per pound. With imports declining during the 1979-1981 period, the domestic industry reentered the market for smaller bolts and screws. In 1979, there were 5.4 pieces of domestic standards per pound and in 1981, 6.3 pieces per pound. This change in size coincided with the automobile industry's downsizing program which has necessitated greater quantities of smaller fasteners.

Since imports are concentrated in the smaller sizes and domestic fasteners in the larger sizes, data in pounds tend to understate the impact of imports because imports on the average weigh less than the domestic products; conversely, data on pieces tend to overstate import penetration because the average number of imported pieces per pound is greater than the average number of domestic pieces per pound. Although pieces as a unit of measure is less than ideal, it nevertheless should be used as an additional means of assessing import penetration.

Figures 3 & 4 — Changes in the Number of Pieces Per Pound





Imports
U.S. Apparent Consumption
Domestic Shipments — Specials
Domestic Shipments — Standards

Sources: Data extrapolated from statistics supplied by the U.S. International Trade Commission, Bureau of the Census, U.S. Department of Commerce Section 232 Investigation, and the Industrial Fastener Institute (IFI).

Figure 5 — Bolts and Large Screws*

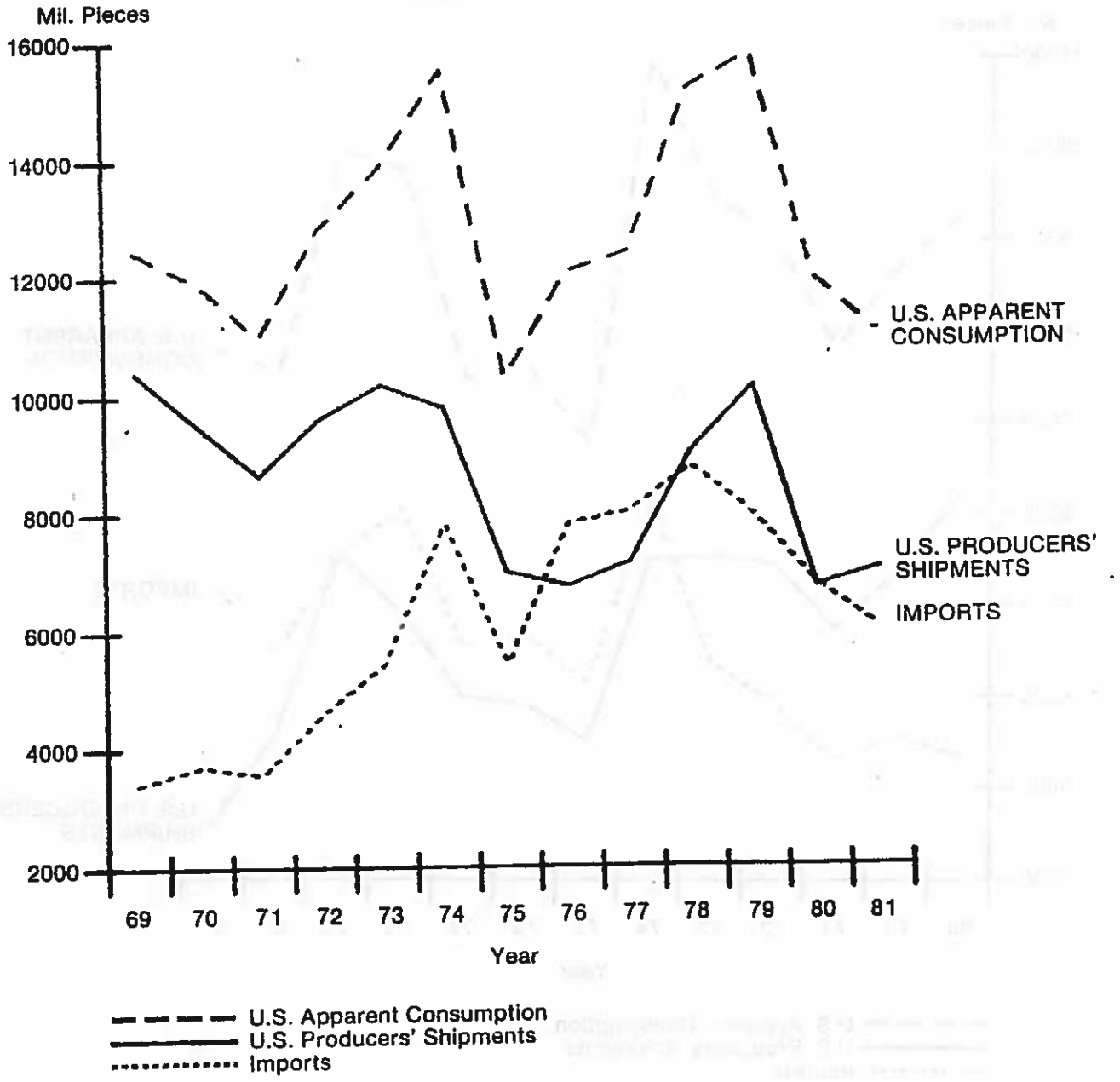


*Figure based on data shown in table 6. See Appendix.

Figure 6 — Nuts*

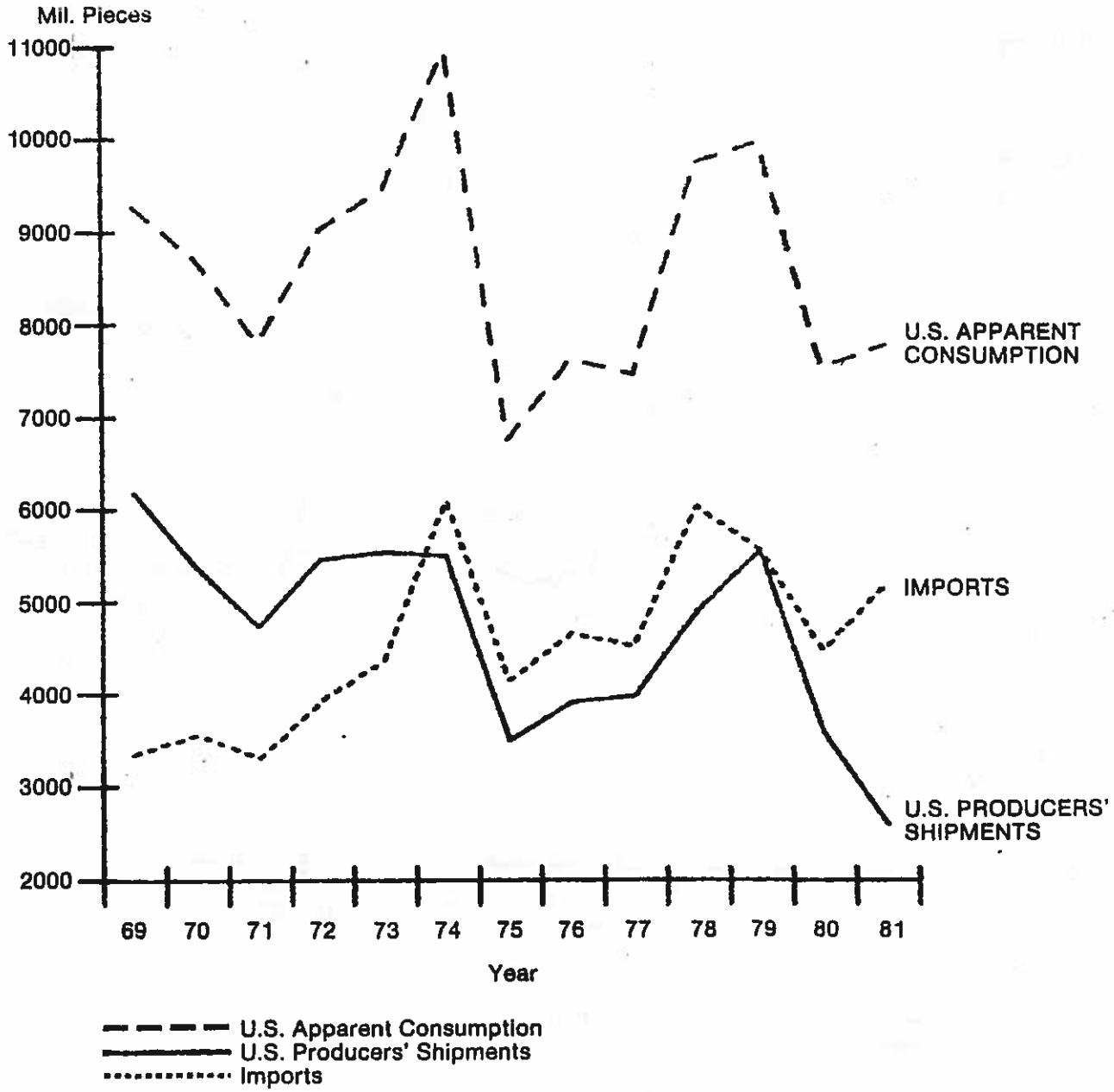


*Figure based on data shown in table 6. See Appendix.

At the time the greatest volume of domestic bolts and large screws (standards) were of the largest size (1976-1977), imports as a percent of apparent consumption (based on pieces) peaked at 65 percent. By 1981, the percentage had dropped to 54 percent. (These ratios indicate greater import penetration than those ratios based on pounds, which, for 1976 and 1977, were 38 percent and for 1981, 39 percent.)

Although the size of imported nuts did not change appreciably in the 1969 - June 1982 period, the size of domestic standard nuts did, reflecting the U.S. industry's growing concentration in the larger hot-formed nuts and its retreat from producing of standard cold-formed nuts.

The ratio of imported nuts to apparent consumption (based on pieces) grew from 36.1 percent in 1969 to a high of 66.6 percent in 1981. In the January-June 1982 period this percentage was 73.6 percent. (These ratios are fairly comparable to those based on pounds. The pound/piece relationship for small and large nuts is closer than that for different size bolts and large screws.)

F. Standards and Specials (See Tables 7 and 8 and Figures 7-14)

Imported nuts, bolts and large screws are principally standards, not specials. Based on pounds, imported standard bolts and large screws as a percentage of U.S. apparent consumption grew from 22.7 percent in 1969 to 49.3 percent in 1981. In terms of pieces, imported standards accounted for 84.6 percent of consumption in 1977 (a high) and 68.8 percent in 1981, compared with 38.2 percent in 1969.

Imported bolts and screws represented at most 15 percent (based on pounds) and 21 percent (based on pieces) of the specials consumed in the 1969-1981 period.

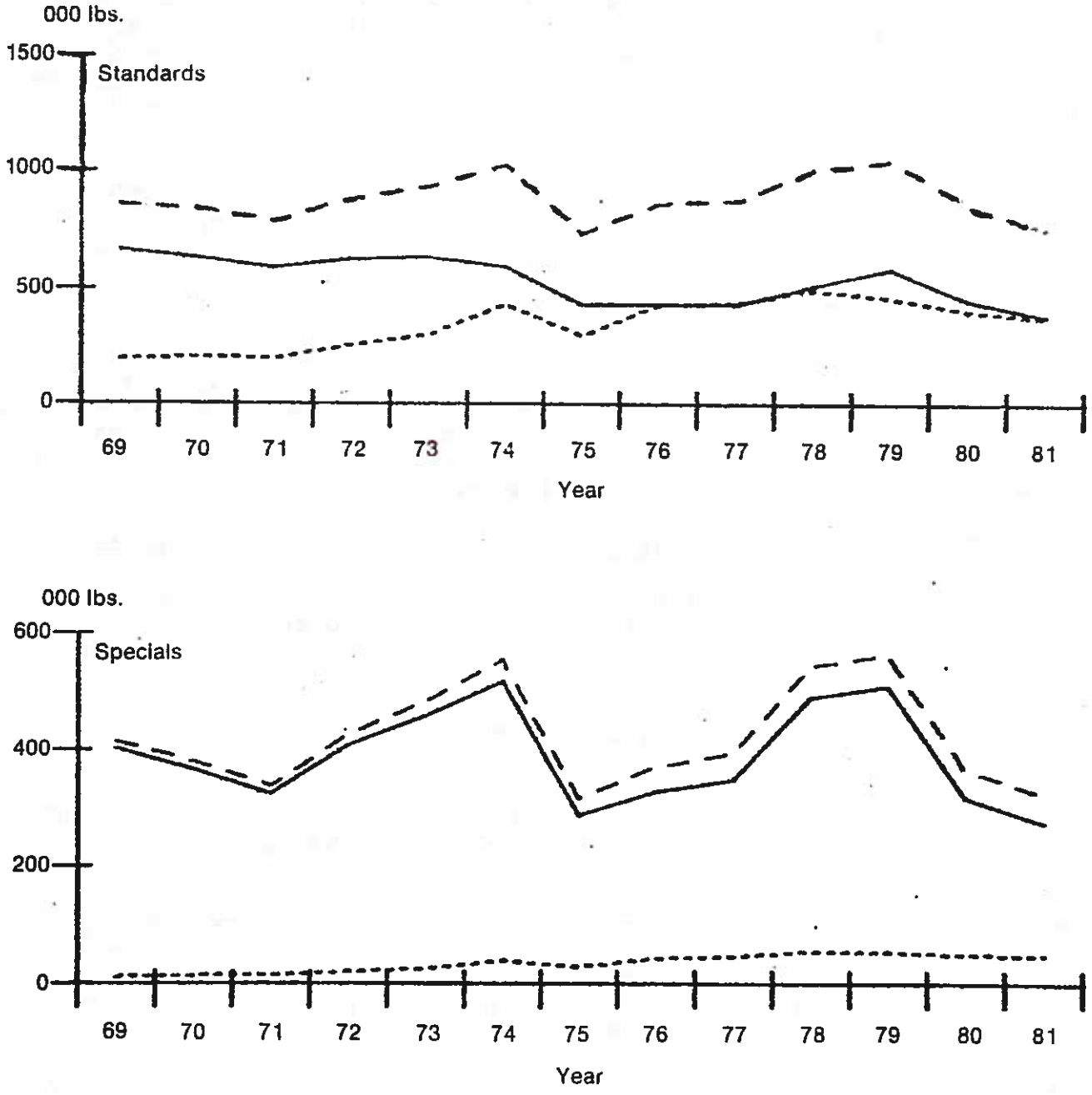
Import penetration of the standard nut market appears severe, whether measured in pounds or pieces. Based on pounds, imported nuts represented 78.3 percent of standard nuts consumed in 1981, the largest percentage in the thirteen year period. This compares with 84.2 percent (1981) based on pieces.

Imported special nuts accounted for 23.8 percent (pounds) and 25.5 percent (pieces) in 1981.

Dollar Value -

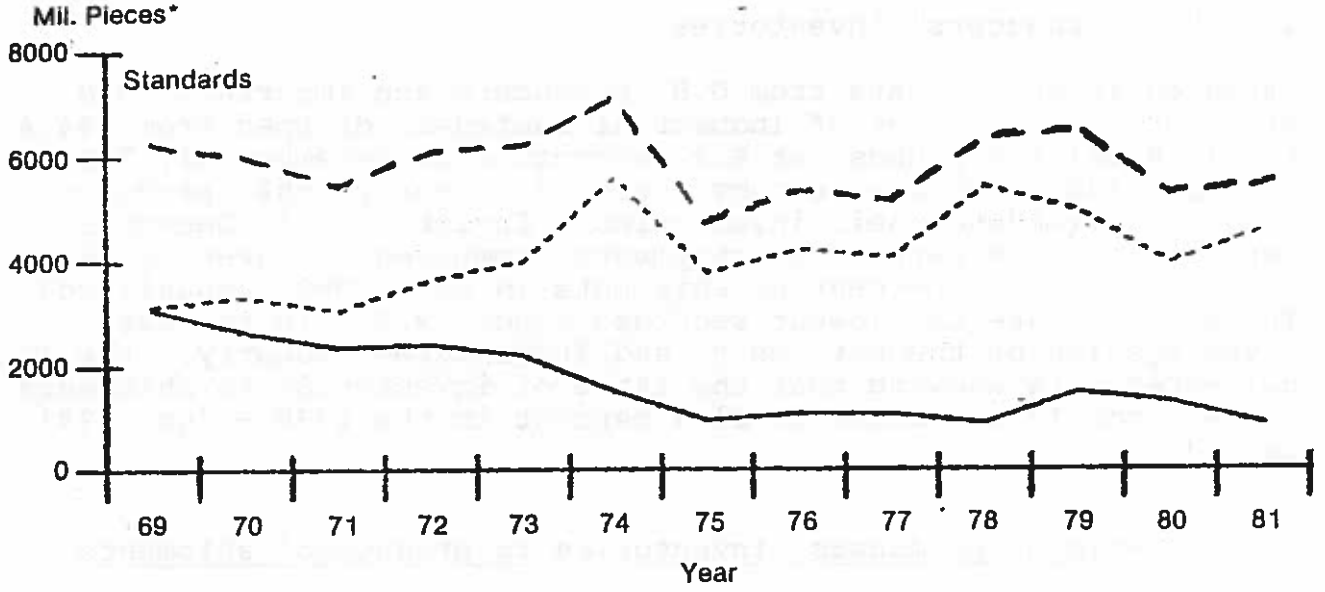
Because of inflation and the price differences beween domestic and imported products, the dollar value of shipments over time is a less reliable indicator of trends than is weight or pieces. Tables 1, 3 and 5 in the Appendix, nevertheless, provide data on the value of shipments over time.

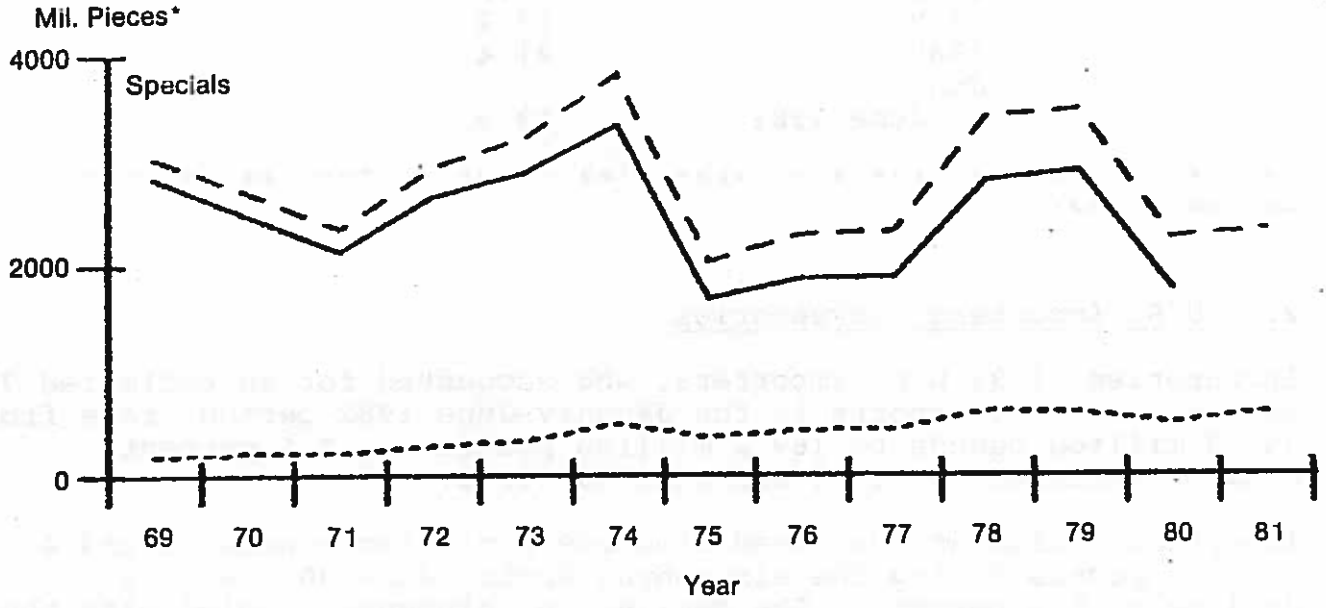
Figures 7 & 8 — Bolts and Large Screws — Standards and Specials*



*Figures based on data shown in table 8. See Appendix.

Figures 13 & 14 — Nuts — Standards and Specials*





U.S. Apparent Consumption
Domestic Shipments
Imports

*Figures based on data shown in table 7. See Appendix.

G. Inventories

1. U.S. Producers' Inventories

Based on inventory data from U.S. producers and importers, U.S. producers' inventories of industrial fasteners dropped from 154.4 to 144.9 million pounds, or 6.2 percent, from December 31, 1981 and June 30, 1982. As the economy worsened in early 1982, producers tried to liquidate their inventories. Inventories in December 1981 represented 15.9 percent of shipments, compared to inventories representing 17.8 percent of shipments in June 1982 (annualized). These ratios are the lowest recorded since 1979. In its 1981 investigation of the nut, bolt, and large screw industry,* the ITC collected data showing that the ratio of inventories to shipments ranged from 17.2 percent to 21.4 percent in the 1978 - June 1981 period.

Ratio of producers' inventories to producers' shipments

Period	Percent
1978	17.2
1979	17.2
1980	21.4
Jan. -June 1981	18.9

Source: Compiled from data appearing in USITC Publication 1193, November 1981.

2. U.S. Importers' Inventories

Inventories of 31 U.S. importers, who accounted for an estimated 78 percent of total imports in the January-June 1982 period, rose from 155.8 million pounds to 169.2 million pounds, or 8.6 percent, between December 30, 1981 and June 30, 1982.

Importers' shipments declined from 299.2 million pounds to 283.4 million pounds during the six months ending June 30, 1982, a decline of 5.2 percent. The decline in shipments coupled with the rise in inventories led the ratio of importers' inventories to importers' shipments to increase from 52.1 percent to 59.7 percent in the December 1981-June 1982 period.

These ratios were significantly greater than the ratios of producers' inventories to producers' shipments in the same periods (15.9 percent and 17.8 percent respectively). Importers generally maintain large inventories so that they can quickly respond to orders despite long shipping distances. In addition, unlike U.S. producers, importers sell mostly standard fasteners, which are readily inventoried items.

*/Investigation No. TA-203-11, Under Section 203 of the Trade Act of 1974. See USITC Publication 1193, November 1981.

V. EMPLOYMENT

One index of an industry's health and continued ability to serve the nation during an emergency is the stability and skill level of its workforce. It is important, therefore, to assess whether the industrial fastener industry has been able to attract and maintain a skilled and productive labor force which is adequate for meeting emergency needs.

A. Number Employed

The number of production workers in the industrial fastener industry increased between 1978 and 1979 and dropped thereafter. In 1979, the start of a three-year import relief period granted to the industry by the President, employment rose from 13,316 to 13,698, an increase of three percent. Employment declined however, to 11,330 workers in 1980, 11,000 in 1981 and to approximately 10,500 as of June 30, 1982, a drop of 23 percent from the 1979 level.

The Department of Labor estimates that 17,502 production workers (assuming a 45-hour work week, two shifts, five days) are required to meet the capacity output (as of June 30, 1982) of 1,755 million pounds. If a longer work week were considered, output could be expanded and the number of workers could be reduced to reach the same level of output achieved by 17,502 production workers in peacetime.

B. Hourly Earnings

The Department of Labor, based on a survey of the segment of the industry under investigation, estimates that workers are paid an average hourly wage of $9.39. This wage exceeds the $8.25 average for the broader industry which includes not only nuts, bolts and screws but also rivets and washers (SIC 3452).* In 1982, the average hourly wage for all manufacturing was $8.20. Most workers in the industrial fasteners industry are union members.

C. Trade Adjustment Assistance to Workers

In addition to the DOC-provided Trade Adjustment Assistance to firms discussed in Section II, Part A, the Department of Labor provides assistance to workers. From 1976 to 1981, the Department of Labor conducted 163 investigations to determine whether imports of industrial fasteners had caused employment dislocation in the domestic industry. These petitions were filed with the Department of Labor under the worker's Trade Adjustment Assistance program, pursuant to the Trade Act of 1974. The Department found that an estimated 7,217 workers in plants covered by 38 of the petitions had been adversely affected by imports. In plants covered by 125

*See Appendix H.

petitions, the Department found that 6,774 laid-off workers had not been adversely affected by imports. Through September 1981, the Department of Labor had paid $13,614,906 in trade readjustment allowances to those workers found to have been injured by imports. In addition, $6,844 was paid to four workers as relocation allowances, $563 was provided for job search allowances and training assistance was given to 35 workers.

D. Unique and Critical Occupations

Unique and critical occupations are defined for purposes of this investigation as those unique to the fastener industry, critical to the production of fasteners, and which would constrain expansion of production if their numbers were not increased. In addition, the skilled workers in these occupations must have at least a year of on-the-job-training and/or experience at a fastener establishment. Six occupations meet these criteria:

Unique and Critical Jobs	On-the-Job-Training and/or Experience Required	Optimum Proficiency
1. Boltmaker	1 to 2 years	3 to 5 years
2. Cold-header, Set-up and Operate	2 to 4 years	4 to 5 years
3. Nut Tapper, Automatic Set-up and Operate	2 to 3 years	3 to 5 years
4. Roll Threader, Automatic Set-up and Operate	1 to 2 years	3 to 5 years
5. Nut Former (Hot and Cold), Set-up and Operate	2 to 3 years	4 to 5 years
6. Machinist	3 to 4 years	6 to 8 years

An estimated 4,200 skilled workers (about 40 percent of total production workers) were employed in these six occupations on June 30, 1982. In an expansion, however, the percentage of these skilled workers to total production workers could drop to as low as 30 percent (see "labor hoarding" in Part E, Productivity) because far greater numbers of other kinds of production workers (including skilled, semi-skilled and unskilled requiring some on the job experience to attain their optimum efficiency) would be hired to handle the greater volume of business. Also, productivity in the six critical occupations can be stretched by as much as 30 percent by limiting those workers to set-up and repair of machines while less experienced workers operate the machines. To fully utilize current production capacity, skilled workers in the six unique and critical occupations (if estimated at 30 percent of the total) would need to increase by 1,051 workers (to 5,251) and all other production workers would need to increase by 5,951 (to 12,251).

The Department of Labor notes that various types of machinery and equipment used in this segment of the industrial fastener industry differ from those found in other sectors of the metal fabricating industry. Allowing workers who are not adequately trained to use fastener manufacturing equipment might seriously damage this unique machinery and equipment.* Such damage would impede rather than expedite the fulfillment of any emergency supply requirements.

The Department of Labor stresses the importance of continued domestic production of industrial fasteners under non-emergency conditions. Labor states that such production assures the continuing availability of skilled personnel and the maintenance of necessary equipment.

E. Productivity

Productivity, for purposes of this discussion, is defined as the ratio of total volume (measured in pounds and number of pieces) of physical output to the number of hours worked to produce that output.

Productivity indexes were developed for (a) the entire industry, (b) the bolts and large screws sector, and (c) the nuts sector.

Nut, Bolt and Large Screw Industry

1969=100

Index 1 Output/Hours Worked (pounds)		Index 2 Output/Hours Worked (pieces)	
Year	Productivity	Year	Productivity
1969	100	1969	100
1970	112	1970	110
1971	106	1971	102
1972	117	1972	112
1973	111	1973	104
1974	122	1974	108
1975	120	1975	108
1976	126	1976	106
1977	127	1977	107
1978	132	1978	115
1979	133	1979	122
1980	116	1980	100

*/See Labor Transferability Within Industry SIC 3452, Appendix H.

With the exception of 1980, Indexes 1 and 2 show that productivity in the nuts, bolts and large screws industry has improved since 1969. Contributing to increased productivity are the industry's closing of certain old production facilities and its purchase of newer, more efficient capital equipment. Index 1 depicts a more favorable picture of productivity than Index 2, particularly for years 1974 through 1980. The domestic industry's increasing focus on larger, heavier fasteners (this reaction to imports referred is to as size displacement) in recent years skews both indexes, but in opposite directions. Because the number of pieces produced has declined as fastener sizes have increased, one would expect Index 2 to show falling productivity. Declining worker hours, however, has tended to keep productivity relatively stable despite shrinking piece output.

Like Index 1, Index 2 shows productivity peaking in 1978 and 1979, years when demand for fasteners was great, and declining significantly in 1980. When domestic demand for fasteners shrunk in 1980, production and productivity declined. Swings in productivity tend to track fastener demand cycles due to "labor hoarding." When fastener demand declines, the industry finds it more cost effective to retain its skilled labor force rather than to lay off workers and train new ones as demand surges. Thus output declines to a greater extent than employment during an economic downswing and will rise more than employment during a demand surge.

Bolts and Large Screws

1969=100

Index 3 Output/Hours Worked (pounds)		Index 4 Output/Hours Worked (pieces)	
Year	Productivity	Year	Productivity
1969	100	1969	100
1970	114	1970	111
1971	108	1971	105
1972	118	1972	112
1973	116	1973	109
1974	125	1974	109
1975	125	1975	113
1976	132	1976	108
1977	134	1977	112
1978	139	1978	120
1979	137	1979	124
1980	122	1980	105

Productivity in the bolts and large screws sector has risen more sharply than for the industry as a whole. (See Indexes 3 and 1, and 4 and 2.) The size displacement phenomenon is chiefly responsible for the difference because bolts and large screws are heavier than nuts. The industry's reallocation of resources away from nuts and into the bolts and large screws sector (a move provoked by import penetration) has also contributed to the difference. The emphasis on larger, heavier bolts and screws rather than on the lighter products explains the differences between Indexes 3 and 4.

Nuts

1969=100

Index 5 Output/Hours Worked (pounds)		Index 6 Output/Hours Worked (pieces)	
Year	Productivity	Year	Productivity
1969	100	1969	100
1970	108	1970	107
1971	97	1971	96
1972	112	1972	111
1973	96	1973	95
1974	109	1974	106
1975	101	1975	98
1976	105	1976	102
1977	101	1977	99
1978	110	1978	106
1979	119	1979	117
1980	96	1980	92

In contrast to the bolt and large screw sector, productivity in the nut sector did not increase significantly during the period. Index 6, in fact, shows productivity dropping below that of the base year in five of the 12 years under review. Productivity in 1980 was the lowest it had ever been in the case of Index 6, and the lowest it had been for several years in the case of Index 5.

Because size displacement has been less significant in the nut industry, there are no major differences between Indexes 5 and 6.

VI. MOBILIZATION REQUIREMENTS FOR NUTS, BOLTS AND LARGE SCREWS OF IRON OR STEEL

The Federal Emergency Management Agency (FEMA) calculated the requirements for nuts, bolts and large screws needed during a mobilization. These requirements are based on the conventional mobilization scenario used for this investigation. Using 1982 as a baseline, FEMA estimated that requirements for defense and civilian production will more than double (102 percent) over a four year period. Requirements for defense production alone will reportedly increase 1,241 percent while requirements for civilian production will increase only 17 percent over the same period. (See Appendix F for FEMA's report.)

Mobilization requirements for nuts, bolts and large screws were developed using final demand expenditure levels prepared by the Department of Defense, which were based on the same conventional mobilization scenario developed for National Defense Stockpile planning. Using these expenditure levels, the Federal Emergency Management Agency (FEMA) estimated the requirements for nuts, bolts and large screws and expressed these requirements in constant 1972 dollars as a measure of their physical consumption in the economy. The tables prepared by FEMA list requirements for nuts, bolts and large screws and their percent changes from the baseline year for the military and civilian sectors. FEMA's estimates are based on required increases in the output of goods and services or commodities for a conventional mobilization.

For this investigation the data prepared by FEMA have been converted into 1982 dollars, and are expressed in pounds and pieces of nuts, bolts and large screws using known price-to-pound and pound-to-piece relationships. The data are disaggregated to develop separate requirement estimates for nuts and for bolts and large screws, both because import penetration of the nut market has been higher than that for bolts and large screws, and because capacity between the two is not interchangeable. A distinction is also made between standards and specials because of their different levels of import penetration. (Shortfall data are found in Section IX.)

Mobilization Requirements for
Nuts, Bolts, and Large Screws

	1972$ (000s)	1982$[1/] (000s)	Pounds[2/] (000s)	Pieces (millions)
1982	1,116,730	2,661,503	2,178,560	27,972.7
Mob. Year	1,735,840	4,137,028	3,386,344	43,480.7
Year 1	2,093,680	4,989,868	4,084,432	52,444.1
Year 2	2,257,260	5,379,728	4,403,551	56,541.6
Year 3	2,265,350	5,399,009	4,419,333	56,744.2

Mobilization Requirements for Nuts Bolts, and
Large Screws and Shortfalls

(in thousand pounds)

	Mobilization Requirements	Production Capacity*	Domestic Shortfall	Estimated Imports Range	Shortfall Range
Mob. Year	3,386,344	1,778,600	1,607,744	1,411,000	196,744
War Year 1	4,084,432	1,778,600	2,305,832	654,000-1,023,000	1,282,832-1,651,832
War Year 2	4,403,551	1,778,600	2,624,951	654,000-1,023,000	1,601,951-1,970,951
War Year 3	4,419,333	1,778,600	2,640,733	654,000-1,023,000	1,617,733-1,986,733

*Held constant

The following tables identify the mobilization requirements in a disaggregated manor for each of the products by weight and units, as well as for standards and specials.

Bolts, and Large Screws

	1982$[3] (000s)	Pounds[4] (000s)	Pieces[5] (millions
1982	1,742,239	1,615,428	17,388.7
Mob. Year	2,708,130	2,511,015	27,028.9
Year 1	3,266,404	3,028,655	32,600.8
Year 2	3,521,611	3,265,286	35,148.0
Year 3	3,534,232	3,276,988	35,273.9

Nuts

	1982$[3] (000s)	Pounds[4] (000s)	Pieces[5] (millions)
1982	919,264	563,132	10,584.0
Mob. Year	1,428,898	875,329	16,451.8
Year 1	1,723,464	1,055,777	19,843.3
Year 2	1,858,117	1,138,265	21,393.6
Year 3	1,864,777	1,142,345	21,470.3

Bolts, and Large Screws

	Specials[6]		Standards	
	Pounds (000s)	Pieces (millions)	Pounds (000s)	Pieces (millions)
Mob. Year	865,547	9,316,.9	1,645,468	17,712.0
Year 1	1,097,282	11,811.2	1,931,373	20,789.6
Year 2	1,210,442	13,029.4	2,054,844	22,118.6
Year 3	1,226,442	13,206.6	2,050,084	22,067.3

Nuts

	Specials 6/		Standards	
	Pounds (000s)	Pieces (millions)	Pounds (000s)	Pieces (millions)
Mob. Year	301,726	5,670.5	573,603	10,781.3
Year 1	382,508	7,188.7	673,269	12,654.6
Year 2	421,955	7,930.1	716,310	13,463.5
Year 3	427,694	8,037.9	714,651	13,432.4

Footnotes

1/An inflator for fastener prices of 2.3833 was calculated and applied to convert the aggregated mobilization requirements from 1972$ to 1982$.

2/The aggregated mobilization requirements for nuts, bolts and large screws by weight in pounds was calculated using their 1972 estimated dollar value per pound of .5126.

3/The dollar value per pound for the bolt and large screw mobilization requirements is estimated from distributor prices (producer shipments and imports) for the first six months of 1982. It was estimated at $1.0785. The value of nut requirements is the difference between the total and the derived value for bolts and large screws.

4/A 12-year average ratio of apparent consumption of bolts and large screws to the total apparent consumption of nuts, bolts and large screws of .741512 was used to calculate the weight of needed bolts and large screws. Similarly a ratio of .258488 was applied to obtain nut requirements.

5/Estimated units (pieces) to weight relationships of 10.76413 for bolts and large screws and 18.79362 nuts per pound were applied to derive unit (piece) requirements.

6/The dollar value of mobilization requirements for specials was translated into a weight (pounds) estimate using 1979 as a baseline. Because OEMs consume the bulk of specials, their dollar share of the market in 1979, 76.939 percent, was made equivalent to the overall market share attained by specials (35 percent) in the same year. Changes in the OEM market share during the mobilization years were accounted for by increasing/decreasing the specials share by one percent (in pounds) for every 1.91 percent increase/decrease in the OEM dollar share (The 1980 specials' market share of 30 percent was used as a baseline.).

VII. GENERAL ECONOMIC FACTORS

A. Effect of Current Economic Conditions

Economic recovery has not reached the industrial fastener industry, which has been in an economic slump since 1979. In December 1982, the industry reported it was operating at only 36 percent of capacity. During 1980, when the economy was slowing down and was experiencing double-digit inflation, the industrial fastener industry was operating at 41.3 percent of capacity.

Imports and U.S. producers' shipments of nuts, bolts and large screws react in a cyclical manner similar to the automobile, construction, and appliance industries, its major customers. "A decline in the demand for finished durable goods, as has been seen in recent years, has resulted in an exaggerated decline in the demand for fasteners. A fastener-consuming manufacturer, facing declining demand for his own finished products, sharply reduces his fastener inventory based on current and anticipated trends."*

In recent years, the OEM market has provided an outlet for about 85-90 percent of domestic fastener production, primarily specials. In contrast, only about 40-45 percent of imported fasteners (mainly standards) are sold either directly, or indirectly through distributor channels, to OEMs. The current economic slump has caused a greater decline in domestic production (in 1982 down 54 percent from 1979) than in imports (down an adjusted 17 percent from 1979), because imported fasteners are sold more to meet general demand than to the OEM market.

While overall poor sales of these products can be attributed to the current sluggish performance of the economy, the high value of the dollar in relation to other world currencies, particularly the Japanese yen, has been a major cause of increased imports. And, finally, a large factor enabling foreign firms to compete successfully in the U.S. market is their lower cost for steel, the major raw material which represents as much as 40-50 percent of the cost of the finished product (this percentage applies to standards).

The wide gap between steel prices in the U.S. and those in Japan and more recently in Taiwan and South Korea has contributed to increased imports. The gap widens and narrows with fluctuations in exchange rates, but by and large, it has consistently enabled foreign fastener firms to undercut the American price structure and increase their share of the market.

B. Limits to Domestic Production

This is a capital intensive industry ($50,000 - $100,000 invested per employee). The cost of capital, however, is not considered a major barrier to entry; it is the concern for future profitability

*/As reported in USITC 1193, A-6, November 1981.

in an uncertain market. Investment in new machinery or the establishment of new firms will not occur until profitability is improved and the market is enlarged.

Historical review of the industry's supply response both in times of crisis and to meet increased peacetime demand shows that the fastener supply is highly responsive to demand. Production to meet mobilization requirements will only be limited by wartime competition for scarce raw materials; the lack of new and operable machinery; and the availability of skilled labor. The domestic industry places no unusually large demands on energy and other utilities, and does not require special environmental or safety measures. Consequently, these elements will not restrict domestic production during a mobilization.

The lack of an experienced workforce to operate and maintain the machinery of this industry presents a major limit to increasing production capacity. The industry has attempted to protect itself against wide cyclical changes in demand by retaining skilled employees for as long as possible during economic down swings.

C. Import Reliability

Foreign countries will be major sources of nuts, bolts and large screws during a mobilization. Supplies would come from the primary producing countries of Japan, Taiwan, Canada, and India, and could include increased quantities from countries currently exporting to the United States in small quantities, such as Argentina, Brazil, Mexico, Australia, and countries in Western Europe.

The foreign potential to supply fasteners needed to meet mobilization requirements is limited by a variety of factors: available production; in-place production capacity; raw materials and human resources; commitments made to other countries or demands made by home industries; geographic location; estimated shipping losses of raw materials to the producing countries and the finished product to the U.S.; and the willingness of foreign governments to allow shipments to the U.S.

It is assumed that most of the industrialized countries which are friendly to the U.S. and which have skilled, dependable work forces will remain friendly and will support, through increased production efforts, our emergency needs. Within limitations of installed production capacity and considerable reliance on imports of basic raw materials, supplies from Europe, Asia, Australia, and South America to the U.S. could be expected to respond to increased demand by the U.S. during the mobilization period.

Based upon maximum exports to the U.S. by various foreign countries in years since 1974, at least 890.2 million pounds of imported nuts, bolts and large screws (about 26 percent of mobilization requirements) could be made available. Even if one looks only at 1978, when the level of U.S. fastener imports reached an all time high, at least 849.3 million pounds could be expected.

Japan would be the leading exporter of fasteners during an emergency. The ITC reported that Japan's production of nuts, bolts and large screws amounted to 1.7 billion pounds in 1980 was 1.47 billion pounds in 1978. In 1978 Japan shipped 521.4 million pounds of fasteners to the U.S. or 60 percent of all U.S. fastener imports:

15.8	million pounds of lag screws
141.8	million pounds of bolts
162.9	million pounds of nuts
188.3	million pounds of cap screws
12.6	million pounds of other large screws
521.4	million pounds of nuts, bolts and large screws

During the scenario's war years, there is estimated to be 5-20 percent worldwide interdiction of shipping. Another factor limiting U.S. imports is the availability of raw materials, particularly fastener quality steel wire to producing countries. Notwithstanding these limitations, other countries, in addition to Japan, such as Argentina, Australia, Brazil, Canada, India, Mexico, Taiwan, and South Korea would probably supply fasteners to the U.S. In 1978 these countries shipped 238.1 million pounds of fasteners to the U.S. An increase in fastener imports would not be unrealistic, particularly from Japan and Taiwan, which have large exporting capabilities. These countries are politically stable, have skilled work forces, and are friendly to the U.S.

The ITC reported that Taiwan's production of nuts, bolts and large screws in 1978 was 220.4 million pounds and in 1980 was 275.6 million pounds. Between 1978 and 1980 Taiwan's capacity increased by 25 percent. In 1978 Taiwan exported 85.8 million pounds of nuts, bolts and large screws (about 39 percent of its 1978 reported production) to the United States.

India, a leading producer and exporter, had a reported 1980 production capacity of 313 million pounds of nuts, bolts and screws. India exported only about six percent of its production or about 19 million pounds to the U.S. in 1980.

Fasteners are now made in almost every country in the world.* Basic fastener manufacturing technology is understood worldwide and trade secrets are not kept for long. The U.S. share of worldwide production of all industrial fasteners (in dollars) is estimated at 30 percent. Estimated dollar value of world fastener production and production shares are as follows:

(1980)

	$billion	percent
North American	2.7	33
Europe	1.8	22
Asia	1.4	17
South America	0.4	5
USSR and Eastener Europe	1.5	19
Africa and Australia	0.3	4
	8.1	100

Using these ratios and U.S. capacity of 2.13 billion pounds (in 1980) of nuts, bolts and large screws as reported by the firms surveyed for this investigation, world capacity to produce nuts, bolts and large screws could be as high as 7.10 billion pounds. Countries likely to export fasteners to the U.S. in an emergency are estimated to have a production capacity of 3.4 - 4.75 billion pounds, or about the amount needed in any one year under the mobilization scenario.

Assuming domestic production capability is held constant during mobilization, imports would have to increase two-fold to 1.8 billion pounds, to fulfill mobilization requirements. To do this, supplying countries would provide the U.S. with fasteners from discontinued exports of industrial equipment and fasteners allotted for home consumption, as well as fasteners currently exported to countries other than the U.S. Raw material shortages and shipping losses will eventually limit all supplies.

Information about world production capabilities and expected supplies was obtained from public and private sources and appears on the following table. Where details were not directly available, estimates were made based on production of capital goods and automobiles and from import-export data.

Estimates of Available Imports During a Mobilization
(in million pounds)
per annum

Region/Country	Production Capability	Capability to Export to the U.S. During Mob. Year	During War Years Expected Shipments (Range) low	high
North America				
Canada[1]	200	117	117	117
Mexico	100	20	20	20
South America				
Argentina	80	8	4	8
Brazil	200	25	13	25
Chile	20	2	0	1
Venezuela	20	2	0	1
Western Europe[2]				
France	200	12	0	1
Italy	100	50	0	5
Netherlands	70	18	0	2
United Kingdom	165	13	0	1
W. Germany	850	100	0	10
Far East				
Japan[3]	1800	773	387	644
S. Korea	100	20	10	17
Taiwan	300	173	87	144
Other Asia				
India	313	24	12	20
Oceania				
Australia	60	6	3	5
New Zealand	20	2	1	2
TOTAL NON-COMMUNIST	4598	1365	654	1023
COMMUNIST BLOC	1560	46	0	0
WORLD TOTAL	6158	1411	654	1023

Assume 2/3 of quantities are bolts and large screws and 1/3 are nuts.
All quantities are standards unless indicated otherwise.

1/ 30% of Canadian exports are specials.
2/ 20% of Western European exports are specials.
3/ 15% of Japanese exports are specials.

Sources: International Trade Commission Investigation TA-203-11, New England Research Application Center, Department of State and the Department of Commerce 232 Investigation.

VIII. FOREIGN POLICY CONSIDERATIONS

The imposition of import restrictions for national security reasons could be detrimental to our broad foreign policy and international trade. A limit on the importation of nuts, bolts or large screws into the U.S. would be likely to cause a protest within the General Agreement on Tariffs and Trade (GATT) framework as most countries which supply the U.S. with industrial fasteners are GATT members. The GATT members exporting to the U.S. include: Japan, Canada, Denmark, U.K., Belgium, France, Italy, Australia, West Germany, India, Brazil, Poland and Korea.

An affected GATT member suffering trade injury may resort to Article XXIII claiming a "nullification or impairment" of GATT benefits. Initially, this would require consultation among the parties, and could ultimately lead to an adverse finding against the U.S.

The United States could defend its actions by asserting an exception under the national security provisions of Article XXI. However, since this Article has rarely been used, it is impossible to reliably predict the effectiveness of such a defense. There is essentially no established basis for GATT to disapprove an action justified by a contracting party on national security grounds. Under GATT practice, determinations on what action is "necessary for the protection of essential security interests" is left to the contracting party taking the action. However, should the security exception be invoked, it would not necessarily foreclose a successful challenge under Article XXIII by GATT members claiming impairment of tariff concessions. The U.S. could still be required to pay compensation in order to resolve a dispute or suffer GATT-authorized retaliation. In this case, it must be noted that the U.S. currently has no domestic legal authority to offer compensation.

Import restrictions on nuts, bolts and large screws could adversely affect relations with several developing countries, notably Taiwan, India, Korea and Mexico. Imposition of controls would weaken their potential for foreign exchange earnings as well as signal that the U.S. cannot be relied upon as a trading partner.

IX. ANALYSIS AND CONCLUSION

A. Analysis

As described in the section on methodology, to determine if imports of nuts, bolts, and large screws of iron or steel threaten the national security, we began by determining what U.S. national security requirements (direct defense, defense production, and civilian) for such items. Identification of requirements was based upon guidance in National Security Decision Directive 47 which states that maintenance of the capacity to mobilize resources efficiently and effectively in the event of a national emergency is of fundamental importance to U.S. national security. The directive further states that the broadly defined crisis scenarios are to serve as the principal basis for mobilization planning.

It was determined that this investigation could most appropriately be conducted using the scenario developed for National Defense Stockpile planning. Mobilization requirements were calculated on the basis of this scenario.

The Department of Defense (DOD) provided the Federal Emergency Management Agency (FEMA) with defense mobilization expenditure levels based on that scenario, from which FEMA derived direct defense and defense production requirements for fasteners. FEMA calculated civilian production requirements for fasteners based on the defense requirements mentioned above plus personal austerity in consumption patterns and other considerations and assumptions, as previously stated.

On an aggregated basis, total fastener requirements under the scenario are the following:

Year	Mobilization Requirements Pounds (000s)		
	Defense	Civilian	Total*
Baseline (1982)	157,227	2,021,333	2,178,560
Mobilization Year	584,235	2,802,109	3,386,344
War Year 1	1,332,296	2,752,136	4,084,432
War Year 2	1,789,861	2,613,690	4,403,551
War Year 3	2,108,012	2,311,321	4,419,333

Specific requirements projections for nuts alone and for bolts and large screws alone in addition to requirements for standards and specials, are detailed in Section VI, Mobilization Requirements for Nuts, Bolts and Large Screws of Iron and Steel. With requirements defined, the next step was to examine the possible sources for meeting them: 1) domestic production and 2) reliable imports.

1. Domestic Production

U.S. capacity to produce iron and steel nuts, bolts and large screws in December 1982 totalled 1,778.6 million pounds, and capacity utilization is currently 36 percent, as detailed in the table in Section III, Capacity and Capacity Utilization. Domestic production capacity figures, disaggregated to differentiate bolts and large screws from nuts, is detailed in Section III.

On an aggregated basis, domestic production capacity for fasteners shows shortfalls as follows:

Year	Mobilization Requirements POUNDS OOOs		
	Total Requirements	Domestic* Capacity	Shortfall
Baseline (1982)	2,178,560	1,778,600	399,960
Mobilization Year	3,386,344	1,778,600	1,607,744
War Year 1	4,084,432	1,778,600	2,305,832
War Year 2	4,403,551	1,778,600	2,624,951
War Year 3	4,419,333	1,778,660	2,640,733

The data show that while domestic production capacity, in all four mobilization years could meet defense requirements, additional supply would be required to meet civilian needs. This shortfall could be reduced in the following ways: 1) through a surge in domestic production, 2) through reliable imports, or 3) a combination of the two.

*/This analysis uses current domestic capacity figures. Based on history, it can safely be assumed that in the event of a mobilization, when demand increases, industrial production and capacity will surge.

Overall, domestic fastener capacity has declined 21.5 percent from its 1978 peak of 2.27 billion pounds. Over the past 10 years production capacity has declined 11.5 percent, while capacity utilization has decreased to the current 36 percent from 71 percent in 1972. Capacity and capacity utilization data for the bolts and large screws sector and the nuts sector of the industry show similar declines.

Historically, the fastener industry has been able to increase its production capacity in times of high demand, such as World War II (when it nearly doubled), the Korean conflict and the Vietnam involvement. Lack of skilled labor could be a major constraint to expanding the industry during a mobilization. However, there is evidence that one of the principal reasons the industry has been able to surge in the past is due to the practice of labor hoarding, in which industry finds it more cost effective, even in times of declining demand, to retain its skilled labor force rather than to institute layoffs and train new workers later when demand increases again. Therefore, although the Department of Labor reports that it takes three to eight years to develop proficient workers for certain jobs, industry analysis indicates that in surge times, labor increases can be achieved largely through the use of unskilled or semi-skilled people who augment the existing core of skilled workers.

As detailed in Section V, Employment, the number of workers in the fastener industry has fallen steadily for the last three years. Twenty-three percent fewer workers were employed in 1982 than in 1979. The decline is not wholly due to imports, but to general sluggishness of the economy. Evidence of this is detailed in Section V., Part C., Trade Adjustment Assistance to Workers. Investigations conducted by the Department of Labor from 1976 to 1981 resulted in findings that laid-off workers in 51.6 percent of the cases had been affected adversely by imports.

Labor reports that the industry requires 17,502 production workers to meet its maximum capacity level. As of June 30, 1982, 10,500 workers were employed. Of these, some 40 percent held unique and critical occupations, a ratio that would decline to 30 percent during a mobilization as more unskilled workers are hired. Then, one could assume that with the addition of approximately 1,051 skilled workers and 5,951 semi- or unskilled to the present work force, production could be brought up to capacity. Additional machinery and plant space could also increase production although availability of skilled labor remains a limiting factor.

As detailed in Section II., Part E., Nature of the Industry, Machinery Used by the Industry, sufficient new machinery with technically up-to-date automated controls can be built in the U.S. by several firms increasing production capacity to the equivalent of

500 million pounds by the end of the mobilization year and 500 million to one billion pounds during subsequent years. Similar machinery could be produced in Japan, Taiwan, West Germany, Italy and other countries and shipped to the U.S. during the mobilization year when no shipping losses are anticipated. Used machinery sourced around the world could also enhance domestic production.

The fastener industry follows the ups and downs of the general economy, in particular the automobile, construction and appliance industries. The overall poor sales figures of the domestic fastener industry and the subsequent cutback in employment has paralleled that of the sluggish economy, as have imports. Based on prior experience, it is logical to assume that domestic capacity and employment will increase with an upturn in the economy.

While the demand for fasteners is inelastic, the supply of fasteners is highly responsive to price, especially in the market for standards. Competition, particularly in the standards market, is in the form of price, where 40-50 percent of the standards' selling price is due to steel costs. Standards imports are competitive due to the lower price of steel abroad.

Under surge conditions, domestic industry could meet defense requirements and 12.4 percent of the projected shortfall in civilian requirements. Since this is insufficient to meet fastener requirements under the scenario, we examined the reliability of imports which would be needed to reduce the shortfalls.

2. Imports

Imports, although currently down in absolute terms, have increased their share of the domestic market (by weight), from 21 percent of apparent consumption in 1969 to 53.7 percent in the first half of 1982. (See Table 3 in Appendix)

Fifty-one percent (by weight) of U.S. imports of fasteners come from Japan. Most current sources of U.S. fastener imports are geographically reliable under the terms of the scenario, which specifies that shipping losses from the major exporting countries in Asia would be minimal. Imports from Canada and Mexico are assumed to be assured due to our common border and, in the case of Canada, to the mobilization agreements in place between us. During mobilization and conflict, increased quantities of fasteners could be purchased from Argentina and Brazil if these countries are able to surge their production.

Shipping losses under the scenario during the mobilization year are expected to be zero. During the subsequent war years, they are estimated to be the following:

Origin	War Years 1	2	3
Western Hemisphere (Other than Canada & Mexico), Asia	10%	8%	5%
All Others	20%	15%	10%

Source: Strategic and Critical Materials Stockpile Study - Phase II, page III-41 (unclassified). Confirmed by: Stockpile Policy Guidance Alternatives, September 18, 1975 (classified).

All of the principal countries which export fasteners to the U.S. are considered by the State Department to be politically reliable. Therefore, we could expect uninterrupted supplies of fastener production machinery and fasteners from all our current suppliers during the mobilization year in varying amounts limited by factors such as available and in-place production capacity; availability of raw materials and human resources; commitments made to other countries or demands made by home industries; geographic location; estimated shipping losses of raw materials to the producing countries and the finished product to the U.S.; and the willingness of foreign governments to allow shipping to the U.S. Given the minimal shipping losses specified for the Pacific in the scenario, fastener and fastener production machinery shipments could be expected from Asian suppliers (Japan, Taiwan, South Korea) during the conflict years as well, given the limitations mentioned above.

Because Japan and the other Asian suppliers are dependent upon imports of iron ore, oil, coking coal and other factors of production (except labor) to make steel, their reliability as exporters of fasteners to the U.S. is a function of their ability to produce or otherwise obtain cold-header quality (CHQ) steel. Under surge conditions, the U.S. could supply such countries with steel rod and wire if needed.

3. Comparison of the Domestic and Foreign Industries

It should be noted that most of our fastener imports are standards and that the domestic industry is highly concentrated in the manufacture of specials. This division of production among friendly nations is not detrimental. In fact, market forces work to bring about the lowest cost for each type of product.

Only 20 percent of the standards used in the U.S. are domestically produced. However, it would be easier for the industry to convert production from specials to standards than vice versa, if needed. Therefore, the domestic industry could, under emergency conditions, convert some of its capacity from specials to standards.

The U.S. industry is self-sufficient in the production of specials, and is a net exporter of this type of fastener. However, in 1981, imports of special purpose bolts and large screws accounted for 14.9 percent of the specials market (by weight), and special purpose nuts, 23.8 percent; both these percentages represent increases over recent previous periods.

In a mobilization, special fastener production would compete with standards production for labor, machinery, and raw material. Both types of fasteners would be needed in large numbers under the mobilization scenario.

B. Conclusion

As described in the section on methodology, and in the analysis section above, after assessing the difference between fastener requirements under the scenario and domestic production capacity, we determined that a national security-threatening shortfall exists. In surge and conflict years, domestic producers of the industrial fasteners under investigation could, at current capacities, meet only the defense requirements for these products, but not be able to meet more than 12.4 percent of civilian requirements. Then we addressed the alternate means available to meet the shortfall: surge in domestic production and reliable imports.

Our analysis has shown that most of our foreign fastener sources are politically reliable, due to their stable pro-U.S. governments; and that their geographic locations, in light of projected shipping losses under the scenario, make them reliable in practice, as well. Therefore, reliable imports could comprise an important part of our required supply of industrial fasteners, augment our domestic production, and obviate the threat to our national security.

While it is true that the production capacity of the domestic industry has declined, that is as attributable to general economic conditions as to import penetration. Based on the preceeding analysis of the industry's response to changes in the general economy and the effect of those changes on fastener demand, it can logically be concluded that the domestic industry will come out of its slump along with any upturn in the overall economy.

Accordingly, we have found that nuts, bolts and large screws are not being imported into the United States in such quantities or under such circumstances as to threaten to impair the national security.

X APPENDICES

A. The Act
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Appendix A. The Act

Trade Expansion Act of 1962, Section 232, as amended (Title 19, U.S. Code)

§ 1862. Safeguarding national security

Prohibition on decrease or elimination of duties or other import restrictions if such reduction or elimination would threaten to impair national security

(a) No action shall be taken pursuant to section 1821(a) of this title or pursuant to section 1351 of this title to decrease or eliminate the duty or other import restriction on any article if the President determines that such reduction or elimination would threaten to impair the national security.

Investigations by Secretary of Commerce to determine effects on national security of imports of articles; hearings; report to President; adjustment of imports

(b) Upon request of the head of any department or agency, upon application of an interested party, or upon his own motion, the Secretary of the Commerce (hereinafter referred to as the "Secretary") shall immediately make an appropriate investigation, in the course of which he shall seek information and advice from, and shall consult with, the Secretary of Defense and other appropriate officers of the United States, to determine the effects on the national security of imports of the article which is the subject of such request, application, or motion. The Secretary shall, if it is appropriate and after reasonable notice, hold public hearings or otherwise afford interested parties an opportunity to present information and advice relevant to such investigation. The Secretary shall report the findings of his investigation under this subsection with respect to the effect of the importation of such article in such quantities or under such circumstances upon the national security and, based on such findings, his recommendation for action or inaction under this section to the President within one year after receiving an application from an interested party or otherwise beginning an investigation under this subsection. If the Secretary finds that such article is being imported into the United States in such quantities or under such circumstances as to threaten to impair the national security, he shall so advise the President and the President shall take such action, and for such time, as he deems necessary to adjust the imports of such article and its derivatives so that such imports will not threaten to impair the national security, unless the President determines that the article is not being imported into the United States in such quantities or under such circumstances as to threaten to impair the national security.

Domestic production for national defense; impact of foreign competition on economic welfare of domestic industries

(c) For the purposes of this section, the Secretary and the President shall, in the light of the requirements of national security and without excluding other relevant factors, give consideration to domestic production needed for projected national defense requirements, the capacity of domestic industries to meet such requirements, existing and anticipated availabilities of the human resources, products, raw materials, and other supplies and services essential to the national defense, the requirements of growth of such industries and such supplies and services including the investment,

exploration, and development necessary to assure such growth, and the importation of goods in terms of their quantities, availabilities, character, and use as those affect such industries and the capacity of the United States to meet national security requirements. In the administration of this section, the Secretary and the President shall further recognize the close relation of the economic welfare of the Nation to our national security, and shall take into consideration the impact of foreign competition on the economic welfare of individual domestic industries; and any substantial unemployment, decrease in revenues of government, loss of skills or investment, or other serious effects resulting from the displacement of any domestic products by excessive imports shall be considered, without excluding other factors, in determining whether such weakening of our internal economy may impair the national security.

Report on investigations by Secretary of Commerce; regulations

(d) A report shall be made and published upon the disposition of each request, application, or motion under subsection (b) of this section. The Secretary shall publish procedural regulations to give effect to the authority conferred on him by subsection (b) of this section.

Congressional disapproval of Presidential adjustment of imports of petroleum or petroleum products; disapproval resolution

(e)(1) An action taken by the President under subsection (b) of this section to adjust imports of petroleum or petroleum products shall cease to have force and effect upon the enactment of a disapproval resolution, provided for in paragraph (2), relating to that action.

(2)(A) This paragraph is enacted by the Congress—

(i) as an exercise of the rulemaking power of the House of Representatives and the Senate, respectively, and as such is deemed a part of the rules of each House, respectively, but applicable only with respect to the procedures to be followed in that House in the case of disapproval resolutions and such procedures supersede other rules only to the extent that they are inconsistent therewith; and

(ii) with the full recognition of the constitutional right of either House to change the rules (so far as relating to the procedure of that House) at any time, in the same manner, and to the same extent as any other rule of that House.

(B) For purposes of this subsection, the term "disapproval resolution" means only a joint resolution of either House of Congress the matter after the resolving clause of which is as follows: "That the Congress disapproves the action taken under section 232 of the Trade Expansion Act of 1962 with respect to petroleum imports under _____ dated _____.", the first blank space being filled with the number of the proclamation, Executive order, or other Executive act issued under the authority of subsection (b) of this section for purposes of adjusting imports of petroleum or petroleum products and the second blank being filled with the appropriate date.

(C)(i) All disapproval resolutions introduced in the House of Representatives shall be referred to the Committee on Ways and Means and all disapproval resolutions introduced in the Senate shall be referred to the Committee on Finance.

(ii) No amendment to a disapproval resolution shall be in order in either the House of Representatives or the Senate, and no motion to suspend the application of this clause shall be in order in either House

nor shall it be in order in either House for the Presiding Officer to entertain a request to suspend the application of this clause by unanimous consent.

Pub.L. 87–794, Title II, § 232, Oct. 11, 1962, 76 Stat. 877; Pub.L. 93–618, Title I, § 127(d), Jan. 3, 1975, 88 Stat. 1993; 1979 Reorg. Plan. No. 3, § 5(a)(1)(B), eff. Jan. 2, 1980, 44 F.R. 69274, 93 Stat. 1381; Pub.L. 96–223, § 402, Apr. 2, 1980, 94 Stat. 301.

Historical Note

References in Text. Section 232 of the Trade Expansion Act of 1962, referred to in subsec. (e), is this section.

Codification. Provision of subsec. (b) of this section which required the Secretary to consult with the Secretary of Commerce in the course of an investigation was omitted in view of the transfer of all functions under this section to the Secretary of Commerce. See Transfer of Functions note set out below.

1980 Amendment. Subsec. (e). Pub.L. 96–223 added subsec. (e).

1975 Amendment. Subsec. (b). Pub.L. 93–618, § 127(d)(1) to (3), substituted "Secretary of the Treasury (hereinafter referred to as the 'Secretary')" for "Director of the Office of Emergency Planning (hereinafter in this section referred to as the 'Director')", substituted "advice from, and shall consult with, the Secretary of Defense, the Secretary of Commerce, and other appropriate officers of the United States" for "advice from other appropriate departments and agencies", inserted provision for public hearings by the Secretary as part of his investigation, added requirement that the Secretary report to the President when he recommends inaction in the same way that a report to the President is required when he recommends action under this section, and placed a 1-year time limit on the Secretary's investigation before making his recommendations to the President.

Subsec. (c). Pub.L. 93–618, § 127(d)(4), substituted "Secretary" for "Director" in two places.

Subsec. (d). Pub.L. 93–618, § 127(d)(4), substituted "Secretary" for "Director".

Transfer of Functions. "Secretary of Commerce" was substituted for "Secretary of the Treasury" in subsec. (b), in view of the transfer of all functions of the Secretary of the Treasury under this section to the Secretary of Commerce by Reorg.Plan No. 3 of 1979, § 5(a)(1)(B), 44 F.R. 69274, 93 Stat. 1381, eff. Jan. 2, 1980, as provided by section 1–107(a) of Ex. Ord.No.12188, Jan. 2, 1980, 45 F.R. 993, set out as notes under section 2171 of this title.

Legislative History. For legislative history and purpose of Pub.L. 87–794, see 1962 U.S.Code Cong. and Adm. News, p. 3110. See, also, Pub.L. 93–618, 1974 U.S. Code Cong. and Adm.News, p. 7186; Pub. L. 96–223, 1980 U.S.Code Cong. and Adm. News, p. 7186.

Appendix B. The Regulations

SECTION 232 REGULATIONS

15 C.F.R § 359 (1982)

PART 359—EFFECT OF IMPORTED ARTICLES ON THE NATIONAL SECURITY

Sec.

AUTHORITY: Sec. 232 Trade Expansion Act of 1962, as amended (Pub. L. 93-618, 88 Stat. 1993, 19 U.S.C. 1862); Reorg. Plan No. 3 of 1979 (44 FR 69273, Dec. 3, 1979); Exec. Ord. 12188 of Jan. 2, 1980 (45 FR 989, Jan. 4, 1980); Dept. of Commerce Org. Ord. No. 10-3 (45 FR 6141, Jan. 25, 1980); and International Trade Admin. Organization and Function Order No. 41-1 (45 FR 11862, Feb. 22, 1980).

SOURCE 47 FR 14692, April 6, 1982, unless otherwise noted.

§ 359.1 Definitions.

As used in this part:

"Department" means the United States Department of Commerce and includes the Secretary of Commerce and the Secretary's designees.

"Secretary" means the Secretary of Commerce or the Secretary's designees.

"Applicant" means the person or entity submitting a request or application for an investigation pursuant to this part.

§ 359.2 Purpose.

These regulations set forth the procedures by which the Department shall commence and conduct an investigation to determine the effect on the national security of the imports of any article. Based on this investigation, the Secretary shall make a report and recommendation to the President for action or inaction regarding an adjustment of the imports of the article.

§ 359.3 Commencing an investigation.

Upon request of the head of any government department or agency, upon application of an interested party, or upon motion of the Secretary, the Department shall immediately conduct an investigation to determine the effect on the national security of the imports of any article.

§ 359.4 Criteria for determining effect of imports on the national security.

(a) To determine the effect on the national security of the imports of the article under investigation, the Department shall consider the quantity of the article in question or other circumstances related to its import. With regard for the requirements of national security, the Department shall also consider the following:

(1) Domestic production needed for projected national defense requirements;

(2) The capacity of domestic industries to meet projected national defense requirements;

(3) The existing and anticipated availabilities of human resources, products, raw materials, production equipment and facilities, and other supplies and services essential to the national defense;

(4) The growth requirements of domestic industries to meet national defense requirements and the supplies and services including the investment, exploration and development necessary to assure such growth; and

(5) Any other relevant factors.

(b) In recognition of the close relation between the strength of our national economy and the capacity of the United States to meet national security requirements, the Department shall also, with regard for the quantity, availability, character and uses of the imported article under investigation, consider the following:

(1) The impact of foreign competition on the economic welfare of any domestic industry essential to our national security;

(2) The displacement of any domestic products causing substantial unemployment, decrease in the revenues of government, loss of investment or specialized skills and productive capacity, or other serious effects; and

(3) Any other relevant factors that are causing or will cause a weakening of our national economy.

§ 359.5 Request or application for an investigation.

(a) A request or application for an investigation shall be in writing. The original and 12 copies shall be filed with the Director, Office of Industrial Resource Administration, Room 3876, U.S. Department of Commerce, Washington, D.C. 20230.

(b) When a request, application or motion is under investigation, or when an investigation has been completed pursuant to § 359.10 of this part, any subsequently filed request or application concerning imports of the same or related article that does not raise new or different issues may be either consolidated with the investigation in progress as provided in § 359.7(e) of this part, or rejected. In either event, an explanation for taking such action shall be promptly given to the applicant. If the request or application is rejected, it will not be returned unless requested by the applicant.

(c) Requests or applications shall describe how the quantity, availability, character, and uses of a particular imported article, or other circumstances related to its import, effect the national security, and shall contain the following information to the fullest extent possible:

(1) Identification of the applicant;

(2) A precise description of the article;

(3) Description of the domestic industry affected, including pertinent information regarding companies and their plants, locations, capacity and current output of the industry;

(4) Pertinent statistics on imports and domestic production showing the quantities and values of the article;

(5) Nature, sources, and degree of the competition created by imports of the article;

(6) The effect that imports of the article may have upon the restoration of domestic production capacity in the event of national emergency;

(7) Employment and special skills involved in the domestic production of the article;

(8) Extent to which the national economy, employment, investment, specialized skills, and productive capacity is or will be adversely affected;

(9) Revenues of Federal, State, or local Governments which are or may be adversely affected;

(10) National security supporting uses of the article including data on applicable contracts or sub-contracts, both past and current; and

(11) Any other information or advice relevant and material to the subject matter of the investigation.

(d) Statistical material presented should be, if possible, on a calendar-year basis for sufficient periods of time to indicate trends. Monthly or quarterly data for the latest complete years should be included as well as any other breakdowns which may be pertinent to show seasonal or short-term factors.

§ 359.6 Confidential information.

(a) Any information or material which the applicant or any other party desires to submit in confidence at any stage of the investigation that would disclose national security classified information or business confidential information (trade secrets, commercial or financial information, or

any other information considered sensitive or privileged), shall be submitted on separate sheets with the clear legend "National Security Classified" or "Business Confidential," as appropriate, marked at the top of each sheet. Any information or material submitted that is identified as national security classified must be accompanied at the time of filing by a statement indicating the degree of classification, the authority for the classification, and the identity of the classifying entity. By submitting information or material identified as business confidential, the applicant or other party represents that the information is exempted from public disclosure, either by the Freedom of Information Act (5 U.S.C. 552 et seq.) or by some other specific statutory exemption. Any request for business confidential treatment must be accompanied at the time of filing by a statement justifying non-disclosure and referring to the specific legal authority claimed.

(b) The Department may refuse to accept as business confidential any information or material it considers not intended to be protected under the legal authority claimed by the applicant, or under other applicable legal authority. Any such information or material so refused shall be promptly returned to the submitter and will not be considered. However, such information or material may be resubmitted as non-confidential in which case it will be made part of the public record.

§ 359.7 Conduct of an investigation.

(a) If the Department determines that it is appropriate to afford interested parties an opportunity to present information and advice relevant and material to an investigation, a public notice shall be published in the FEDERAL REGISTER soliciting from any interested party written comments, opinions, data, information or advice relative to the investigation. This material shall be submitted as directed within a reasonable time period to be specified in the notice. All material shall be submitted with 6 copies. In addition, public hearings may be held pursuant to § 359.8 of this part.

(b) All requests and applications filed and all materials submitted by interested parties, except information or material that is classified or determined to be confidential as provided in § 359.6 of this part, will be available for public inspection and copying in the International Trade Administration Freedom of Information Records Inspection Facility, Room 3102, U.S. Department of Commerce, Washington, D.C. 20230, in accordance with regulations published in Part 4 of Title 15, Code of Federal Regulations.

(c) Further information may be requested by the Department from other sources through the use of questionnaires, correspondence, or other appropriate means.

(d) The Department shall, as part of an investigation, seek information and advice from, and consult with, the Secretary of Defense and any other appropriate officers of the United States or their designees, as shall be determined. Communications received from agencies of the U.S. Government or foreign governments will not be made available for public inspection. The Department may also seek assistance in the conduct of an investigation from other agencies of the United States, as shall be necessary.

(e) Any request or application that is filed while an investigation is in progress, concerning imports of the same or related article and raising similar issues, may be consolidated with the request, application or motion that initiated the investigation.

§ 359.8 Public hearings.

(a) If it is deemed appropriate by the Department, public hearings may be held to elicit further information.

(1) A notice of hearing shall be published in the FEDERAL REGISTER describing the date, time, place, the subject matter of each hearing and any other information relevant to the conduct of the hearing. The name of a person to contact for additional information or to request time to speak at the hearing shall also be included. Public hearings may be held in more than one location.

(2) Hearings shall be open to the public unless national security classified information will be presented. In that event the presiding officer at the hearing shall close the hearing, as nec-

essary, to all persons not having appropriate security clearances or not otherwise authorized to have access to such information. If it is known in sufficient time prior to the hearing that national security classified information will be presented, the notice of hearing published in the FEDERAL REGISTER shall state that national security classified information will be presented and that the hearing will be open only to those persons having appropriate security clearances or otherwise specifically authorized to have access to such information.

(b) Hearings shall be conducted as follows:

(1) The Department shall appoint the presiding officer;

(2) The presiding officer shall determine all procedural matters during the hearing;

(3) Interested parties may appear, either in person or by representation, and produce oral or written information relevant and material to the subject matter of the investigation;

(4) Hearings will be fact-finding proceedings without formal pleadings or adverse parties. Formal rules of evidence will not apply;

(5) After a witness has testified, the presiding officer may question the witness. Questions submitted to the presiding officer in writing by any interested party may, at the discretion of the presiding officer, be posed to the witness. No cross examination of any witness by a party shall be allowed.

(6) Each hearing will be stenographically reported. Transcripts of the hearing, excluding any national security classified information, may be purchased from the Department at actual cost of duplication, and will be available for public inspection in the International Trade Administration, Freedom of Information Records Inspection Facility, Room 3102, U.S. Department of Commerce, Washington, D.C. 20230.

§ 359.9 Emergency action.

In emergency situations, or when in the judgment of the Department, national security interests require it, the Department may vary or dispense with any or all of the procedures set forth in § 359.7 of this part.

§ 359.10 Report of an investigation and recommendation.

(a) When an investigation conducted pursuant to this part is completed, a report of the investigation shall be promptly prepared. The report shall be organized in several sections, if necessary. One section shall contain all information and material that is not classified or confidential as provided in § 359.6 of this part. Another section shall contain all national security classified information and material. A third section shall contain all business confidential information and material.

(b) The Secretary shall report to the President the findings of the investigation and a recommendation for action or inaction within one year after receiving a request or application or otherwise beginning an investigation pursuant to this part.

(c) The report, excluding the sections containing national security classified and business confidential information and material, shall be published in the FEDERAL REGISTER upon the disposition of each request, application, or motion made pursuant to this part. Copies of the published report will then be available for public inspection and copying in the International Trade Administration, Freedom of Information Records Inspection Facility, Room 3102, U.S. Department of Commerce, Washington, D.C. 20230.

Appendix C. Federal Register Notice

Initiation of Investigation of Imports of Bolts, Nuts and Large Screws of Iron or Steel

AGENCY: Office of Industrial Resource Administration, International Trade Administration, Commerce.

ACTION: Notice of initiation of an investigation under section 232 of the Trade Expansion Act of 1962, as amended (19 U.S.C. 1862), and request for comments.

SUMMARY: This notice is to advise the public that an investigation is being conducted under section 232 of the Trade Expansion Act of 1962, as amended (19 U.S.C. 1862) to determine the effects on the national security of imports of bolts, nuts and large screws of iron or steel (excluding mine roof bolts but including lag screws and bolts). Interested parties are invited to submit written comments, opinions, data, information or advice to the Resource Assessment Division, Office of Industrial Resource Administration, U.S. Department of Commerce.

EFFECTIVE DATE: Comments must be received by June 1, 1982.

ADDRESS: Written comments (10 copies) should be sent to Robert F. Kan, Program Manager, Resource Assessment Division, Office of Industrial Resource Administration, ITA, U.S. Department of Commerce (Room 3877), Washington, D.C. 20230.

FOR FURTHER INFORMATION CONTACT: Robert F. Kan, Program Manager, Resource Assessment Division, Office of Industrial Resource Administration, International Trade Administration, U.S. Department of Commerce, Washington, DC 20230 (202) 377-3984.

SUPPLEMENTARY INFORMATION: In an application received from the Secretary of Defense on February 11, 1982, the Secretary of Commerce was requested to initiate an investigation under section 232 of the Trade Expansion Act of 1962, as amended (19 U.S.C. 1862), to determine the effect on the national security of imports of standard and special bolts, nuts and large screws of iron or steel (excluding mine roof bolts but including lag screws and bolts) provided for in TSUS items:

646.4920,
646.5400,
646.5600,
646.6320, and 646.6340.

This investigation is being undertaken in accordance with International Trade Administration Regulation 15 CFR Part 359. Interested parties are invited to submit written comments, opinions, data, information or advice with respect to this investigation to the Resource Assessment Division, Office of Industrial Resource Administration, U.S. Department of Commerce, by June 1, 1982.

All relevant material will be helpful, however, the Department is particularly interested in comments and information directed to the criteria listed in § 359.4 of the Regulations (15 CFR 359.4) as they affect the national security.

(a) Quantity and circumstances related to the importation of these articles;

(b) Domestic production and productive capacity of these items to meet anticipated national security requirements;

(c) Existing and potential availability of skilled labor, raw materials, production equipment and facilities to produce these items;

(d) Growth requirements of domestic industries (if any) to meet national security requirements and/or requirements to assure such growth;

(e) The impact to foreign competition on the economic welfare and on the capacity of the domestic industry to meet national security needs;

(f) The impact of imports on domestic competition, productivity, and the strength of the domestic industry to meet national security requirements.

All material should be submitted in 10 copies and will be made available at the Department of Commerce for public inspection and copying, except for information or material that is national security classified or determined to be business confidential as provided in § 359.6 of the Regulation (15 CFR 359.6). Communications from agencies of the United States Government or from foreign governments will not be made available for public inspection.

The public record concerning this investigation will be maintained in the International Trade Administration's Freedom of Information Records Inspection Facility, Room 3102, U.S. Department of Commerce, 14th and Pennsylvania Avenue, NW., Washington, D.C. 20230. The records in this facility may be inspected and copied in accordance with regulations published in Part 4 of Title 15 of the Code of Federal Regulations. Information about the inspection and copying of records at the facility may be obtained from Mrs. Patricia L. Mann, the International Trade Administration's Freedom of Information Officer (202-377-3031).

If deemed appropriate by the Department, a public hearing may be held to elicit further information as provided in § 359.8 (15 CFR 359.8) of the regulation. Adequate notice will be given as to time, place and matters to be considered at the hearing(s) so that interested parties will have an opportunity to participate. The findings of this investigation and a recommendation by the Secretary of Commerce for action or inaction regarding imports of bolts, nuts and large screws of iron or steel shall be given to the President no later than February 11, 1983.

Dated: March 25, 1982.

Bo Denysyk,

Deputy Assistant Secretary for Export Administration.

[FR Doc. 82-8578 Filed 3-30-82; 8:45 am]
BILLING CODE 3510-25-M

Appendix D. Synopsis of Comments Received

D. Synopsis of Comments Received

During the comment period announced in the Federal Register notice of March 31, 1982, five comments were received from:

1. Daniel Industries, Inc., Bolt and Nut Division, Houston, Texas, a manufacturer of studs (TSUS 646.5700) and hex nuts (TSUS 646.5600).

2. Usinor Steel Corporation (Usinor), a wholly owned subsidiary of Usinor Industries, Inc. of Delaware, submitted by Kaplan and Pellegrini of New York, New York. Usinor imports fasteners made in France.

3. The Fasteners Institute of Japan and the Japan Machinery Exporters Association, submitted by Tanaka Walders & Ritger of Washington, D.C.

4. American Association of Exporters and Importers, Industrial Fasteners Group, submitted by Barnes, Richardson & Colburn of Washington, D.C. and New York, New York.

5. Allied International - American Eagle Trading Corp., Rye, New York, an exporter and importer of industrial fasteners.

In addition to these five comments, the Industrial Fasteners Institute (IFI)in Cleveland, Ohio, submitted comments:

IFI's comments emphasized that most standards and specials are produced on the same machinery, with the same technology, the same labor and that the quality of one to the other is not superior, but different. IFI stressed that there is only one industry that is producing either or both standards and specials.

IFI pointed out that standards, as well as specials, are important and are used in much greater numbers by both the military and civilian sectors of the economy. The institute also noted that U.S. fastener export capacity is not necessarily divertable in emergency to domestic use since allied countries, primarily Canada, are dependent upon U.S. fasteners. IFI also recommended and discussed a number of remedies, should a positive finding be made.

The other commenters recognized the malaise suffered by the domestic industry but only one commenter, Daniel Industries, attributed the industry's problems to imports. The remaining commenters laid general economic conditions to blame.

Two commenters stressed that a distinction should be made between "standard" industrial fasteners and "special" industrial fasteners. These commenters held that specials, rather than standards, are most important to defense needs. Because imports consist mainly of standards, they do not constitute a threat to national security, the commenters stated.

Two commenters differ as to the adequacy of the domestic labor force to meet fastener requirements in an emergency. One is confident that the shrinking labor force can easily be built up by obtaining new and/or experienced workers from other industries during mobilization and training them in a timely fashion. The other commenter doubts that the training of necessary workers can be accomplished quickly enough in an emergency.

Most of the commenters noted the ill effects of import restrictions, should they be imposed.

One commenter requested that clamps, which are now classified under Tariff Schedules of the U.S. (TSUS) item 646.54 be excluded from the investigation.

Appendix E. Prior Investigations Concerning this Industry

E. Prior Investigations Concerning this Industry

a. Investigation Conducted Pursuant to Section 232 of the Trade Expansion Act of 1962

There was one previous investigation pertaining to the impact of imported nuts, bolts and large screws on the national security.

In February 1978 the President directed the Secretary of Treasury to initiate an expedited national security investigation pertaining to nuts, bolts (except mine-roof bolts) and large screws, including lag screws, provided for in items 646.49, 646.54, 646.56, and 646.63 of the Tariff Schedules of the United States (TSUS). The President took this action in light of a staff study by the Federal Preparedness Agency (now the Federal Emergency Management Agency) which indicated that domestic fastener production capability was inadequate to satisfy U.S. requirements in a national emergency.

In October 1978 the Secretary of the Treasury reported to the President that imports of nuts, bolts and large screws were not entering the United States in such quantities or under such circumstances as to threaten to impair the national security. The Secretary's report was made public on November 6, 1978.

b. Investigations Conducted Pursuant to Section 201 of the Trade Act of 1974 (19 U.S.C. 2251)

The U.S. International Trade Commission (ITC) instituted three investigations regarding fasteners of iron or steel pursuant to Section 201(b)(1) of the Trade Act of 1974.

(i) Following receipt of a petition filed by Russell, Burdsall & Ward, Inc., the Industrial Fasteners Institute, and the Cap Screw and Special Threaded Products Bureau in June 1975, the ITC instituted an investigation pertaining to nuts, bolts and screws (including small screws and mine-roof bolts)(TSUS items 646.49, 646.54, 646.56, 646.58, 646.60, 646.63 and 646.79). In December 1975 the ITC determined that the products were not being imported into the U.S. in such increased quantities as to be a subtantial cause of serious injury to the domestic industry producing similar articles.

(ii) The ITC instituted an investigation in June 1977 after receiving a petition from the United States Fastener Manufacturing Group, the United Steelworkers of America, and the International Association of Machinists and Aerospace Workers. The following December the ITC determined that nuts, bolts and large screws, including lag screws and excluding mine-roof bolts, (TSUS items 646.49, 646.54, 646.56, and

646.63) were being imported into the U.S. in such increased quantities as to be a substantial cause of serious injury, or the threat thereof, to the domestic industry producing articles like or directly competitive with the imported articles. The ITC recommended import relief in the form of higher tariffs.

The ITC made no determination with respect to imports of Canadian articles admitted free of duty (pursuant to the U.S.-Canada Automotive Products Trade Agreement of 1965) as original equipment for motor vehicles under item 646.79 of the TSUS.

In February 1978 the President determined that import relief was not in the national economic interest and so advised Congress. Concurrent with that decision was the President's directive to the Secretary of the Treasury to initiate an expedited national security investigation under Section 232 of the Trade Expansion Act of 1962 regarding nuts, bolts and large screws (TSUS items 646.49, 646.54, 646.56 and 646.63).

(iii) Following receipt of a resolution of the House Committee on Ways and Means, and after soliciting and receiving public comment, the ITC instituted a reinvestigation less than one year after reporting the findings on imported nuts, bolts (except mine-roof bolts) and large screws (including lag screws) (TSUS items 646.49, 646.54, 646.56, 646.63 and 646.79).

On the basis of the investigation the ITC determined, in November 1978, that the fasteners (with the exception of TSUS item 646.79) were being imported into the U.S. in such increased quantities as to be a substantial cause of serious injury to the domestic industry producing articles like or directly competitive with the imported articles. Consequently, the ITC recommended increasing tariffs for TSUS items 646.49, 646.54, 646.56 and 646.63.

No determination was made with respect to TSUS item 646.79. (Imports of these fasteners admitted free of duty from Canada as original equipment for motor vehicles according to the U.S.-Canada Automotive Products Trade Agreement of 1965.)

In January 1979 the President directed that duties on nuts, bolts (except mine-roof bolts) and large screws of iron or steel (mentioned above, not including TSUS item 646.79) be increased 15 percent ad valorem in addition to the existing duties of 0.2 cents per pound and 0.1 cent per pound, respectively, on imported nuts (TSUS item 646.56) and bolts (TSUS item 646.54). He directed that the various forms of relief terminate January 5, 1982, and removed these nuts and bolts from eligibility for duty-free entry under the Generalized System of Preferences (GSP) during the period of relief.

c. Industry Review Authorized by Section 203 of the Trade Act of 1974 (19 U.S.C. 2253)

Prior to the January 1982 termination of temporary duty increases on nuts, bolts (except mine-roof bolts) and large screws (including lag screws) the ITC was petitioned to institute an investigation of the probable economic effect of the extension, reduction or termination of import relief on the domestic fastener industry.

In November 1981 the ITC made its report to the President. Three Commissioners stated that import relief should not be extended. They advised that the termination of import relief then in effect would not have an adverse economic effect on the domestic industry producing nuts, bolts and large screws. Two Commissioners advised that termination of import relief would have an adverse economic effect on the domestic industry and recommended that the relief then in effect be extended for the full three-year period allowable.

In January 1982 the President allowed the temporary import relief on nuts, bolts and large screws (TSUS items 646.49, 646.54, 646.56 and 646.63) to terminate. Tariffs on these items returned to levels in effect prior to January 1979.

d. Investigations Conducted Pursuant to Section 332(b) of the Tariff Act of 1930, as amended (19 U.S.C. 1332(b))

After duties on nuts, bolts and large screws increased in January 1979, the ITC conducted an investigation pursuant to Section 332(b) of the Tariff Act of 1930, as amended. Following the investigation, the ITC initiated two series of monitoring reports. Quarterly surveys of the nuts, bolts and large screws industry were issued between May 1979 and November 1981. Three annual surveys of the industry were made available between March 1979 and March 1981.

e. Investigations Conducted Pursuant to Section 303, Tariff Act of 1930, as amended (19 U.S.C. 1303); Administrative Reviews of Countervailing Duty Order Conducted Pursuant to Section 751, Tariff Act of 1930 (19 U.S.C. 1675)

In the past decade countervailing duty investigations have been conducted with respect to: cap screws from Italy; nuts, bolts and screws from India; and certain fasteners from Japan.

(i) Following an investigation, the Department of the Treasury determined in August 1976 that bounties or grants were being paid or bestowed, directly or indirectly, on exports of iron or steel cap screws, 1/4" in diameter and over (TSUS item 646.63), from Italy. Treasury imposed countervailing duties on imports of such screws.

The Department of Commerce conducted an administrative review of the countervailing duty order and determined in August 1981 that subsidies had been conferred on such screws between January 1, 1980 and December 31, 1980. Due to the request for an injury determination* pertaining to the 1976 order, the Department, in effect, suspended payment of countervailing duties as of April 3, 1980.

As required by law, the Department terminated its countervailing duty order in October 1981 when, at the request of the petitioner, the ITC terminated its countervailing duty investigation pursuant to section 104(b) of the Trade Agreements Act of 1979.

*The ITC had been requested to make an injury determination for the countervailing duty order under Section 104(b) of the Trade Agreements Act of 1979.

(ii) Upon conclusion of an investigation, the Department of the Treasury determined in May 1977 that bounties or grants were paid or bestowed, directly or indirectly on nuts and bolts from Japan (TSUS items 646.54 and 646.56). Countervailing duties were imposed on Japanese nuts and bolts entered for consumption in the U.S.

In June 1979 the countervailing duty order was expanded to include additional fasteners from Japan (TSUS items 646.17, 646.40, 646.41, 646.49, 646.51, 646.53, 646.58, 646.60, 646.65, 646.72, 646.74, 646.75, 646.76 and 646.78).

In October 1981 the Department of Commerce increased the duties on nuts and bolts (TSUS items 646.54 and 646.56) from Japan which had been entered, or withdrawn from warehouse, for consumption from June 4, 1979 through December 31, 1979. The Department determined that the net subsidy for nonmetric fasteners (TSUS items 646.17, 646.40, 646.41, 646.49, 646.51, 646.53, 646.58, 646.60, 646.63, 646.65, 646.72, 646.74, 646.75, 646.76, and 646.78) was "de minimus"; therefore shipments of such fasteners were not subject to countervailing duties from June 4, 1979 through December 31, 1979.

The Department will complete another administrative review of the countervailing duty order within the next few months.

(iii) Acting upon a petition filed by the Industrial Fasteners Institute, the Department of Commerce (the Department) determined in July 1980 that the Government of India was conferring benefits upon the production or export of certain fasteners, which constituted subsidies within the meaning of the countervailing duty law. The Department ordered that countervailing duties be applied to nuts, bolts and screws (TSUS items 646.49, 646.54, 646.56, 646.58, 646.60 and 646.63) imported from India and entered, or withdrawn from warehouse, for consumption in the U.S.

An administrative review of the order was completed in January 1982. The Department determined that subsidies were accorded fasteners from India during the period July 21, 1980 - December 31, 1980. The Customs Service was instructed to assess duties.

In October 1982 the Department revoked the countervailing duty order on duty-free nuts and bolts from India (TSUS items 646.5400 and 646.5600). The revocation was effective January 6, 1982.*

*On January 6, 1982 nuts and bolts from India (TSUS items 646.5400 and 646.5600) acquired duty-free status under the Generalized System of Preferences ("GSP").

Appendix F. FEMA Study

Report on the Estimation of the Requirements for Nuts, Bolts, and Large Screws Based on the Conventional Mobilization Scenario

The Federal Emergency Management Agency (FEMA) has been assigned the task of estimating the requirements for nuts, bolts and large screws for the conventional mobilization scenario accepted by the National Security Council (NSC). FEMA was given this assignment because the pattern of expenditures by the Department of Defense (DoD) for the conventional mobilization has been made available to FEMA by DoD, and the necessary input-output data is already resident on FEMA's computers.

FEMA has compiled the estimates of the requirements for nuts, bolts, and screws based on the conventional mobilization scenario. The purpose of this report is to present the findings and to describe the calculating procedures, sources of data, and the assumptions upon which the estimates are based.

These estimates are contained in three tables attached to this report. The unit of measurement is constant $1972, which is a measure of physical consumption of nuts, bolts, and large screws rather than in pounds, tons or any other physical unit of measurement. All values in the tables and this report are expressed in terms of constant $1972 since data on consumption patterns by each industry is available measured only in these terms. The three tables list the requirements for total production and end-use consumption; and civilian and defense production respectively.

The Office of Industrial Resources Administration (OIRA) of the Department of Commerce (DoC) provided FEMA with data on the consumption of nuts, bolts and large screws of iron and steel during 1972. These data were based on estimates compiled from the following sources:

Penton/IPC Marketing Research and Economic Analysis(1975)
Frost & Sullivan, 1980 Market for Industrial Fasteners
Penton/IPC Market Report:Mechanical Fasteners & Adhesives(1982)
Bureau of the Census:1967, 1972, 1977 Census of Manufactures
Bureau of Economic Analysis: Input-Output data for 1967, 1972
International Trade Commission Reports, 1975-1981

Since data on the consumption patterns of nuts, bolts, and large screws is available to any degree of reliability only for the year 1972, and the level of industrial detail is limited, the benchmark input-output table for 1972 was aggregated to 37 industries. Also, the level of consumption by each industry is measured in constant $1972. These values represent the physical consumption of nuts, bolts, and large screws but in constant dollar terms, not in pounds nor any other physical measurement. Table 1 lists the 37 industrial categories used, their related SIC and BEA input-output codes, and the consumption by each industrial category as measured in constant $1972.

TABLE 1: I-O INDUSTRIES FOR THE 232 INVESTIGATION OF NUTS, BOLTS, AND LARGE SCREWS (MILLIONS OF CONSTANT $1972)

INDUSTRIAL CATEGORIES	RELATED SIC	I-O CODES	CONSUMPTION
AGRICULTURE,FORESTRIES,FISHERIES	01-09	01-04	1601.6
MINING & EXTRACTIVE INDUSTRIES	10-14	05-10	4759.3
NEW & MAINTENANCE CONSTRUCTION	15-17	11-12	68982.5
FOOD PROCESSING	20	14	1537.2
TOBACCO PRODUCTS	21	15	77.6
TEXTILES AND APPAREL	22-23	16-19	1284.1
WOOD AND LUMBER	24	20-21	6566.9
FURNITURE AND FIXTURES	25	22-23	6347.0
PAPER AND PAPER PRODUCTS	26	24-25	337.2
PRINTING AND PUBLISHING	27	26	811.5
CHEMICALS AND ALLIED PRODUCTS	28	27-30	2404.9
PETROLEUM REFINING & RELATED PRD.	29	31	827.3
RUBBER AND MISC. PLASTIC PRODUCTS	30	32	3827.8
LEATHER AND LEATHER PRODUCTS	31	33-34	1524.2
STONE, CLAY & GLASS PRODUCTS	32	35-36	683.4
PRODUCTION OF BASIC METALS	33	37-38	6000.0
FABRICATED METAL PRODUCTS	34	39-42	166800.1
ENGINES,TURBINES & IND. MACH.	PART 35	43,45-47,49	91960.3
SPECIAL INDUSTRIAL MACHINERY	355	48	8035.7
ELECTRONIC & OTHER MACHINRY	357-359	50-52	17838.0
FARM AND GARDEN MACHINERY	352	44	18573.8
ELECTRICAL TRANSFORMERS & EQ.	361-362	53	30454.2
APPLIANCES,ELEC. EQ.,RADIOS,TV'S	363-365	54,PT.56	25673.6
ELECTRICAL MACHINERY & EQUIP.	366-369	PT.56-58	28317.5
MOTOR VEHICLES AND PARTS	371	59	233295.0
AIRCRAFT AND PARTS	372	60	8186.0
SHIP,BOATBUILDING & REPAIRS	3731	6101	800.5
RAILROAD EQUIPMENT	374	6103	5955.3
COMPLETE GUIDED MISSILES	3761	1301	544.0
TANKS AND COMPONENTS	3795	1303	1691.9
OTHER TRANSPORTATION EQUIP.	PART 37	PART 61	12168.7
PROF.,SCI. INSTR.&SUPPLIES	38	62-63	8195.0
MISCELLANEOUS MANUFACTURING	39	64	2572.0
TRANSPORTATION,COMM.,UTILITIES	40-49	65-68	1248.9
SERVICES,FINANCE&INSURANCE	50-83+	69-79	70647.4
NONCOMPARABLE IMPORTS		80	-----
SPECIAL AND DUMMY INDUSTRIES		80-84	----
CIVILIAN END-USE		91-99 EXC.96	126808.6
MILITARY END-USE		96	3863.0
TOTAL NUTS,BOLTS&LARGE SCREWS			971202.0

For this investigation, the BEA benchmark input-output table was aggregated from 496 industries to the 37 intermediate industries and final demand categories listed in Table 1. Actually, two tables were aggregated: the "Use" and the "Make" transactions tables. With these two tables, two allocation matrices are derived. The first shows the ratios of each industries consumption of categories of goods and services, termed "commodities". The second lists the ratios of categories of goods and services that are produced by each industrial category. With these two matrices, the analyst has the option of compiling one of two input-output tables: a "commodity-by-commodity" table or an "industry-by-industry" table. The former shows the technology, based on inputs per-dollar of output, to produce each commodity category, irrespective of those groups of industrial categories that produce them. The latter shows the purchases, per-dollar of output, by each industrial category in order to carry out its operations, irrespective of the mix of goods and services it produces.

Because a successful mobilization depends upon a large increase in the output of goods and services - commodities, rather than the operations of industrial enterprises, a commodity-by-commodity table has been derive and used to compile estimates of the requirements for nuts, bolts, and large screws for a conventional mobilization.

The commodity-by-commodity table was compiled based on the "industry technology assumption" which states that the allocation of each category of goods and services from each industrial category is based on its relative production of each category of goods and services. For example, let's say an industrial establishment produces two goods: steel and aluminum. Ninety percent of its output is steel and ten percent aluminum. The industry technology assumption means that 90% of each of its inputs will be allocated to the steel commodity category and 10% to the aluminum commodity category.

As a reminder that our estimates of the requirements for nuts, bolts, and large screws are based on commodity categories rather than industrial establishments, the first column of each of the attached tables reads: "Commodities by Industrial Title".

To compute the requirements for nuts, bolts and large screws based on the production of commoditites, not industry purchases, the data on consumption provided by DoC was adjusted. This was done by applying the consumption data by industry to the coefficient matrix derived from the Make table. This served to allocate the consumption of nuts, bolts, and large screws by industry to each commodity category. Consumption ratios were derived by dividing each commodity's consumption by the output of that commodity in 1972. These ratios were applied to output estimates derived from the 37 industry input-output table adjusted into a commodity-by-commodity table based on technologies in 1972. The total requirements matrix derived from

this table was applied to final demands by the military and civilians for the conventional mobilization. This yielded output levels for each industry during the conventional mobilization. The year 1982 has been pegged as the peacetime year followed by the four years relevant to the scenario.

The attached tables list requirements in constant $1972 and percent changes from the baseline year. The baseline year is 1982; thus, the requirements shown for that year are for the last peacetime year prior to the mobilization. If the weighted average price per pound of nuts, bolts, and large screws in 1972 is applied to the constant $1972 values listed, then the values could have been listed in pounds rather than constant $1972. However, the percent changes over the baseline year 1982 will be exactly the same no matter which unit of measurement is used.

For the comparison of required output with capacity, the capacity measurement must also be in constant $1972.

232 INVESTIGATION OF NUTS, BOLTS, AND LARGE SCREWS

REQUIREMENTS FOR DEFENSE AND CIVILIAN PRODUCTION*
BASED ON THE CONVENTIONAL MOBILIZATION SCENARIO

	000 OF CONSTANT $1972				PERCENT CHANGES OVER 1982 BASELINE PERIOD				
COMMODITIES BY INDUSTRIAL TITLE	1982	MOB YR	YEAR 1	YEAR 2	YEAR 3	1982	MOB YR	YEAR 1	YEAR 2	YEAR 3
AGRICULTURE, FORESTRIES, FISHERIES	1974.	2156.	2173.	2198.	2148.	0.00	9.19	10.03	11.32	8.79
MINING & EXTRACTIVE INDUSTRIES	4814.	6266.	7184.	7323.	7194.	0.00	30.15	49.22	52.12	49.42
NEW & MAINTENANCE CONSTRUCTION	53918.	66021.	66667.	61564.	56411.	0.00	22.45	23.64	14.18	4.62
FOOD PROCESSING	1849.	1987.	2061.	2071.	2043.	0.00	7.45	11.46	12.01	10.50
TOBACCO PRODUCTS	89.	95.	99.	100.	99.	0.00	7.46	12.18	12.98	11.96
TEXTILES AND APPAREL	2231.	2440.	2342.	2204.	2049.	0.00	9.36	4.97	-1.23	-8.17
WOOD AND LUMBER	6462.	8289.	8851.	8330.	7842.	0.00	28.27	36.97	28.91	21.36
FURNITURE AND FIXTURES	8249.	11971.	11012.	9244.	8226.	0.00	45.11	33.49	12.05	-0.29
PAPER AND PAPER PRODUCTS	904.	1058.	1136.	1132.	1111.	0.00	17.03	25.59	25.20	22.87
PRINTING AND PUBLISHING	728.	813.	826.	728.	794.	0.00	11.66	13.43	-0.01	9.03
CHEMICALS AND ALLIED PRODUCTS	3659.	4467.	5206.	5516.	5569.	0.00	22.09	42.28	50.75	52.21
PETROLEUM REFINING & RELATED PRD.	985.	1121.	1176.	1160.	1118.	0.00	13.79	19.39	17.72	13.44
RUBBER AND MISC. PLASTIC PRODUCTS	5156.	6627.	7204.	7214.	7004.	0.00	28.51	39.70	39.91	35.83
LEATHER AND LEATHER PRODUCTS	2152.	2206.	2081.	1929.	1732.	0.00	2.53	-3.31	-10.36	-19.52
STONE, CLAY & GLASS PRODUCTS	1000.	1274.	1365.	1311.	1244.	0.00	27.30	36.46	31.03	24.37
PRODUCTION OF BASIC METALS	10304.	18131.	24482.	27339.	28077.	0.00	75.97	137.60	165.32	172.49
FABRICATED METAL PRODUCTS	177880.	315457.	485644.	597245.	646904.	0.00	77.34	173.02	235.76	263.68
ENGINES, TURBINES & IND. MACH.	119576.	210889.	236997.	247683.	238508.	0.00	76.36	98.20	107.14	99.46
SPECIAL INDUSTRIAL MACHINERY	9154.	14788.	15498.	15079.	13571.	0.00	61.54	69.30	64.72	48.26
ELECTRONIC & OTHER MACHINRY	31764.	52135.	56651.	58223.	55830.	0.00	64.13	78.35	83.30	75.76
FARM AND GARDEN MACHINERY	20656.	39765.	41833.	42639.	38860.	0.00	92.51	102.52	106.42	88.13
ELECTRICAL TRANSFORMERS & EQ.	39252.	71573.	83801.	88597.	87059.	0.00	82.34	113.49	125.71	121.79
APPLIANCES, ELEC. EQ., RADIOS, TV'S	34108.	41917.	39384.	30348.	26779.	0.00	22.89	15.47	-11.03	-21.49
ELECTRICAL MACHINERY & EQUIP.	45186.	99019.	150980.	171393.	185949.	0.00	119.14	234.13	279.30	311.52
MOTOR VEHICLES AND PARTS	237410.	369001.	398601.	403260.	365701.	0.00	55.43	67.90	69.86	54.04
AIRCRAFT AND PARTS	14419.	28088.	48277.	65278.	78269.	0.00	94.80	234.82	352.73	442.83
SHIP, BOATBUILDING & REPAIRS	1284.	5504.	8414.	9911.	10792.	0.00	328.48	555.05	671.63	740.18
RAILROAD EQUIPMENT	7026.	13069.	13676.	14198.	13212.	0.00	86.00	94.64	102.07	88.04
COMPLETE GUIDED MISSILES	626.	1767.	3559.	4137.	4666.	0.00	182.20	468.30	560.60	645.03
TANKS AND COMPONENTS	5097.	13662.	34640.	40883.	48061.	0.00	168.06	579.67	702.16	843.01
OTHER TRANSPORTATION EQUIP.	10948.	14834.	14796.	7545.	7300.	0.00	35.50	35.15	-31.08	-33.32
PROF., SCI. INSTR. &SUPPLIES	13652.	22267.	24753.	26552.	25524.	0.00	63.11	81.32	94.50	86.97
MISCELLANEOUS MANUFACTURING	3561.	4140.	2741.	3287.	1891.	0.00	16.27	-23.02	-7.68	-46.88
TRANSPORTATION, COMM., UTILITIES	2529.	3168.	3590.	3832.	3879.	0.00	25.27	41.96	51.53	53.37
SERVICES, FINANCE&INSURANCE	83634.	96520.	98072.	100162.	99226.	0.00	15.41	17.26	19.76	18.64
NONCOMPARABLE IMPORTS	0.	0.	0.	0.	0.	0.00	0.00	0.00	0.00	0.00
SPECIAL AND DUMMY INDUSTRIES	2178.	2154.	2186.	2204.	2117.	0.00	-1.11	0.38	1.19	-2.82
TOTAL NUTS, BOLTS&LARGE SCREWS	964415.	1554640.	1907960.	2071820.	2086760.	0.00	61.20	97.84	114.83	116.38
REQUIREMENTS FOR FINAL DEMAND:										
MILITARY END-USE REQUIREMENTS	4888.	11686.	22827.	30404.	35837.	0.00	139.07	366.99	521.99	633.15
CIVILIAN END-USE REQUIREMENTS	147422.	169514.	162895.	155036.	142757.	0.00	14.99	10.50	5.16	-3.16
TOTAL FOR PRODUCTION AND END-USE	1116730.	1735840.	2093680.	2257260.	2265350.	0.00	55.44	87.48	102.13	102.86

*NOTE: TOTALS DO NOT ADD DUE TO ROUND-OFF

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232 INVESTIGATION OF NUTS, BOLTS, AND LARGE SCREWS

REQUIREMENTS FOR DEFENSE PRODUCTION*
BASED ON THE CONVENTIONAL MOBILIZATION SCENARIO

	000 OF CONSTANT $1972				PERCENT CHANGES OVER 1982 BASELINE PERIOD				
COMMODITIES BY INDUSTRIAL TITLE	1982	MOB YR	YEAR 1	YEAR 2	YEAR 3	1982	MOB YR	YEAR 1	YEAR 2	YEAR 3
AGRICULTURE, FORESTRIES, FISHERIES	14.	38.	79.	103.	122.	0.00	179.44	476.12	651.39	786.32
MINING & EXTRACTIVE INDUSTRIES	372.	1067.	2238.	3018.	3559.	0.00	186.72	501.32	711.13	856.48
NEW & MAINTENANCE CONSTRUCTION	2173.	3828.	7114.	9023.	10678.	0.00	76.17	227.39	315.26	391.40
FOOD PROCESSING	10.	30.	63.	81.	95.	0.00	197.75	528.86	708.10	853.55
TOBACCO PRODUCTS	0.	0.	1.	1.	1.	0.00	203.91	525.67	735.46	895.37
TEXTILES AND APPAREL	47.	95.	173.	216.	254.	0.00	101.19	265.48	357.21	436.80
WOOD AND LUMBER	272.	757.	1523.	1994.	2335.	0.00	178.55	460.75	633.98	759.68
FURNITURE AND FIXTURES	135.	364.	634.	743.	854.	0.00	169.68	369.55	450.80	533.26
PAPER AND PAPER PRODUCTS	30.	87.	183.	243.	287.	0.00	189.08	507.84	710.11	855.50
PRINTING AND PUBLISHING	30.	60.	109.	143.	170.	0.00	97.92	262.11	376.22	465.67
CHEMICALS AND ALLIED PRODUCTS	165.	619.	1481.	2072.	2443.	0.00	274.79	796.43	1154.22	1378.61
PETROLEUM REFINING & RELATED PRD.	59.	114.	208.	274.	325.	0.00	93.43	251.31	362.63	448.67
RUBBER AND MISC. PLASTIC PRODUCTS	267.	772.	1597.	2071.	2434.	0.00	188.99	497.94	675.20	811.10
LEATHER AND LEATHER PRODUCTS	14.	27.	49.	57.	66.	0.00	88.80	244.63	300.10	364.84
STONE, CLAY & GLASS PRODUCTS	46.	129.	264.	342.	401.	0.00	177.59	468.88	636.84	765.18
PRODUCTION OF BASIC METALS	1208.	5229.	11552.	15578.	18268.	0.00	332.81	856.19	1189.49	1412.14
FABRICATED METAL PRODUCTS	23012.	111998.	286892.	413600.	486772.	0.00	386.68	1146.68	1697.29	2015.26
ENGINES, TURBINES & IND. MACH.	6630.	24536.	48233.	62075.	72159.	0.00	270.07	627.51	836.29	988.38
SPECIAL INDUSTRIAL MACHINERY	152.	586.	1121.	1411.	1622.	0.00	284.88	635.67	826.03	964.39
ELECTRONIC & OTHER MACHINRY	1093.	4288.	8897.	11790.	14008.	0.00	292.17	713.61	978.20	1181.05
FARM AND GARDEN MACHINERY	102.	324.	779.	980.	1162.	0.00	217.44	663.44	860.57	1039.35
ELECTRICAL TRANSFORMERS & EQ.	2988.	12472.	24030.	30744.	35821.	0.00	317.46	704.31	929.03	1098.96
APPLIANCES, ELEC. EQ., RADIOS, TV'S	582.	1892.	3778.	4736.	5513.	0.00	225.26	549.51	714.39	847.89
ELECTRICAL MACHINERY & EQUIP.	11997.	47935.	99865.	122297.	142140.	0.00	299.55	732.41	919.39	1084.79
MOTOR VEHICLES AND PARTS	6675.	21316.	54325.	66041.	77918.	0.00	219.33	713.85	889.37	1067.30
AIRCRAFT AND PARTS	7522.	18963.	38642.	56114.	70317.	0.00	152.10	413.72	645.99	834.80
SHIP, BOATBUILDING & REPAIRS	767.	4556.	7415.	8881.	9844.	0.00	493.71	866.34	1057.37	1182.88
RAILROAD EQUIPMENT	78.	244.	533.	728.	860.	0.00	214.69	586.57	838.21	1008.00
COMPLETE GUIDED MISSILES	518.	1615.	3373.	3918.	4425.	0.00	211.93	551.46	656.73	754.58
TANKS AND COMPONENTS	5068.	13623.	34600.	40842.	48022.	0.00	168.81	582.74	705.90	847.57
OTHER TRANSPORTATION EQUIP.	78.	334.	815.	1004.	1178.	0.00	325.86	940.54	1180.97	1402.82
PROF., SCI. INSTR. &SUPPLIES	1065.	3346.	6620.	8739.	10325.	0.00	214.19	521.70	720.68	869.62
MISCELLANEOUS MANUFACTURING	56.	170.	334.	438.	513.	0.00	200.38	491.53	675.95	808.17
TRANSPORTATION, COMM., UTILITIES	142.	429.	964.	1335.	1582.	0.00	202.17	579.22	840.10	1014.21
SERVICES, FINANCE&INSURANCE	1824.	5374.	10880.	14452.	17104.	0.00	194.53	496.34	692.10	837.47
NONCOMPARABLE IMPORTS	0.	0.	0.	0.	0.	0.00	0.00	0.00	0.00	0.00
SPECIAL AND DUMMY INDUSTRIES	513.	579.	746.	993.	1151.	0.00	12.77	45.31	93.49	124.35
TOTAL NUTS, BOLTS&LARGE SCREWS	75707.	287793.	660108.	887079.	1044730.	0.00	280.14	771.93	1071.73	1279.97

*NOTE: TOTALS DO NOT ADD DUE TO ROUND-OFF

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232 INVESTIGATION OF NUTS, BOLTS, AND LARGE SCREWS

REQUIREMENTS FOR CIVILIAN PRODUCTION*
BASED ON THE CONVENTIONAL MOBILIZATION SCENARIO

COMMODITIES BY INDUSTRIAL TITLE	000 OF CONSTANT $1972				PERCENT CHANGES OVER 1982 BASELINE PERIOD				
	1982	MOB YR	YEAR 1	YEAR 2	YEAR 3	1982	MOB YR	YEAR 1	YEAR 2	YEAR 3
AGRICULTURE,FORESTRIES,FISHERIES	1961.	2117.	2093.	2095.	2026.	0.00	8.00	6.77	6.83	3.34
MINING & EXTRACTIVE INDUSTRIES	4442.	5199.	4946.	4305.	3634.	0.00	17.04	11.35	-3.08	-18.18
NEW & MAINTENANCE CONSTRUCTION	51745.	62193.	59553.	52541.	45734.	0.00	20.19	15.09	1.54	-11.62
FOOD PROCESSING	1839.	1957.	1998.	1990.	1948.	0.00	6.42	8.65	8.23	5.92
TOBACCO PRODUCTS	88.	95.	98.	99.	98.	0.00	7.13	11.31	11.75	10.46
TEXTILES AND APPAREL	2184.	2345.	2169.	1988.	1795.	0.00	7.37	-0.66	-8.98	-17.80
WOOD AND LUMBER	6190.	7532.	7328.	6336.	5507.	0.00	21.68	18.38	2.36	-11.04
FURNITURE AND FIXTURES	8114.	11607.	10379.	8500.	7371.	0.00	43.04	27.90	4.76	-9.16
PAPER AND PAPER PRODUCTS	874.	971.	953.	889.	824.	0.00	11.11	9.01	1.65	-5.75
PRINTING AND PUBLISHING	698.	753.	717.	585.	624.	0.00	7.94	2.70	-16.23	-10.66
CHEMICALS AND ALLIED PRODUCTS	3494.	3848.	3725.	3443.	3126.	0.00	10.14	6.62	-1.43	-10.52
PETROLEUM REFINING & RELATED PRD.	926.	1007.	968.	886.	793.	0.00	8.70	4.58	-4.32	-14.36
RUBBER AND MISC. PLASTIC PRODUCTS	4889.	5855.	5606.	5144.	4570.	0.00	19.74	14.66	5.20	-6.53
LEATHER AND LEATHER PRODUCTS	2138.	2179.	2031.	1872.	1665.	0.00	1.95	-4.96	-12.43	-22.08
STONE, CLAY & GLASS PRODUCTS	954.	1145.	1101.	969.	843.	0.00	19.99	15.43	1.57	-11.65
PRODUCTION OF BASIC METALS	9096.	12903.	12930.	11761.	9809.	0.00	41.85	42.15	29.30	7.84
FABRICATED METAL PRODUCTS	154867.	203459.	198752.	183645.	160133.	0.00	31.38	28.34	18.58	3.40
ENGINES,TURBINES & IND. MACH.	112946.	186353.	188764.	185608.	166349.	0.00	64.99	67.13	64.33	47.28
SPECIAL INDUSTRIAL MACHINERY	9002.	14201.	14377.	13668.	11949.	0.00	57.76	59.72	51.83	32.75
ELECTRONIC & OTHER MACHINRY	30671.	47847.	47754.	46433.	41822.	0.00	56.00	55.70	51.39	36.36
FARM AND GARDEN MACHINERY	20554.	39441.	41055.	41659.	37697.	0.00	91.89	99.74	102.68	83.41
ELECTRICAL TRANSFORMERS & EQ.	36264.	59101.	59771.	57853.	51238.	0.00	62.97	64.82	59.53	41.29
APPLIANCES,ELEC. EQ.,RADIOS,TV'S	33527.	40025.	35607.	25611.	21267.	0.00	19.38	6.20	-23.61	-36.57
ELECTRICAL MACHINERY & EQUIP.	33189.	51084.	51115.	49096.	43809.	0.00	53.92	54.01	47.93	32.00
MOTOR VEHICLES AND PARTS	230735.	347686.	344276.	337219.	287783.	0.00	50.69	49.21	46.15	24.72
AIRCRAFT AND PARTS	6897.	9125.	9635.	9164.	7953.	0.00	32.31	39.71	32.87	15.31
SHIP,BOATBUILDING & REPAIRS	517.	948.	999.	1030.	947.	0.00	83.29	93.11	99.20	83.23
RAILROAD EQUIPMENT	6949.	12825.	13143.	13470.	12352.	0.00	84.57	89.14	93.85	77.77
COMPLETE GUIDED MISSILES	108.	152.	186.	219.	241.	0.00	40.29	71.46	101.89	122.25
TANKS AND COMPONENTS	29.	39.	40.	40.	39.	0.00	34.27	38.13	40.50	37.24
OTHER TRANSPORTATION EQUIP.	10869.	14501.	13980.	6541.	6122.	0.00	33.41	28.63	-39.82	-43.67
PROF.,SCI. INSTR.&SUPPLIES	12587.	18921.	18133.	17813.	15199.	0.00	50.32	44.06	41.52	20.75
MISCELLANEOUS MANUFACTURING	3504.	3971.	2407.	2849.	1379.	0.00	13.31	-31.31	-18.69	-60.66
TRANSPORTATION,COMM.,UTILITIES	2387.	2739.	2626.	2498.	2297.	0.00	14.75	10.01	4.64	-3.76
SERVICES,FINANCE&INSURANCE	81809.	91147.	87192.	85710.	82122.	0.00	11.41	6.58	4.77	0.38
NONCOMPARABLE IMPORTS	0.	0.	0.	0.	0.	0.00	0.00	0.00	0.00	0.00
SPECIAL AND DUMMY INDUSTRIES	1665.	1575.	1441.	1211.	965.	0.00	-5.39	-13.47	-27.27	-42.02
TOTAL NUTS,BOLTS&LARGE SCREWS	888708.	1266840.	1247850.	1184740.	1042030.	0.00	42.55	40.41	33.31	17.25

*NOTE: TOTALS DO NOT ADD DUE TO ROUND-OFF

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Appendix G. Memorandum from DOC/Bureau of Industrial Economics: Steel Wire and Related Products

UNITED STATES DEPARTMENT OF COMMERCE
Bureau of Industrial Economics
Washington, D.C. 20230

DEC 22 1982

MEMORANDUM FOR John A. Richards, Director
Office of Industrial Resource Administration

FROM: Ralph F. Thompson
Iron and Steel Division

THROUGH: J. D. Darroch, Director
Iron and Steel Division

James M. Owens, Director
Office of Basic Industries

SUBJECT: Steel Wire and Related Products to Support Section 232 Investigation - Nuts, Bolts, and Large Screws

This is in response to your letter of November 3, 1982 confirming conversations among Bob Kan of your office and Jim Owens and Don Darroch of the Office of Basic Industries requesting assistance in your Section 232 investigation of the adequacy for nuts, bolts and large screw making capacity in the U.S. to mobilization needs. We have reviewed the domestic steel industry capability to produce cold heading steels to supply the fastener industry as well as the impact of imports of such steels on domestic production capability and its future adequacy.

It is our conclusion that there is and will continue to be adequate capability in the next few years in the domestic steel industry to produce cold heading and cold forging quality steel in quantities sufficient to meet demand at high levels even if imports of such steel are reduced or virtually eliminated from the domestic supply.

Production of cold heading and cold forging steel requires sophisticated steelmaking practice involving expensive equipment and is not generally employed in commercial grade rod and bar production. As John Tucker of your office has determined in his careful survey of the industry, the following domestic firms are important suppliers of such steel:

Company	Plant Locations
U.S. Steel Corporation	Gary, Indiana South Chicago, ILL Joliet, ILL Lorain, Ohio
Bethelehem Steel Corp.	Johnstown, PA Lackawanna, NY Sparrows Point, MD

Republic Steel Corp.	Chicago, ILL Canton, Ohio
Inland Steel Co.	Chicago, ILL
Armco	Kansas City, MO
Copperweld	Warren, Ohio
Rariton River Steel Co.	Perth Amboy, NJ

These large plants, particularly those of U.S. Steel, Bethlehem and Republic constitute a substantial supply base for cold-heading and forging steel although capacity cannot be quantified since it involves furnaces and rolling mills used alternatively for other types of steel. However, the Joliet facility of U.S. Steel and the Lackawanna plant of Bethlehem Steel, already reduced in capacity during 1977-79, now may be further curtailed. Copperweld and Rariton River are electric furnace plants classified as minimills; their cold-heading grade steelmaking is limited in capacity and size ranges.

Steel rod and bar for cold-forming or for high-quality wire drawing prior to cold-forming require very clean steel, without slag inclusion; it must also be homogeneous throughout the cross section, that is without segregation of constituents. Fine grain and good surface are essential since surface discontinuities in the billet will also be present in the finished rod, bar, or wire. Such discontinuities cause ruptures during the severe deformations experienced in cold-heading or cold-forging of fastener or ordnance items. In order to insure such quality, high standards of steelmaking must be maintained, utilizing equipment and practice not common for commercial steel grades.

Either the electric furnace or basic oxygen furnace may be utilized, preferably the latter, for which iron ore is the primary metallic input. If electric furnaces are used, a high grade of scrap is necessary in order to minimize undesirable trace elements. Careful control is necessary in either case, with low maximum inclusions of phosphorus and sulphur (under .015 percent each). Clean molds, ladles and vessels are necessary; degassing, ladle stirring and inert gas shielding, practices not usual in commercial rod and bar production, are also indicated. The billet or bloom, whether cast by continuous or individual pour, must be ground and then inspected for flaws by eddy current, magna glow or related techniques. Rolling practice is also important, especially control of beginning and ending temperatures and of cooling rate after rolling.

Standard procedure is to guarantee the steel product to perform in cold-forming, whether or not the chemistry and physical

characteristics of the metal have met specifications. This is contrary to normal steel industry business practice, which guarantees only that specifications will be met. Therefore, there is normally considerable interchange of information between user and supplier and some trial testing of steel process changes and well as of product processes by the user. Consequently, proximity of steelmaker to user provides commercial advantages. The major import competition is from Japan which makes very good steel with modern equipment. Japanese suppliers of this product, faced with greater distances and time factors, have apparently tended to "overgrade" their steel sold to the cold-forming user in the U.S. in order to assure performance. In order to do this they employ more precise finishing and careful inspection than normally provided by U.S. and European steel producers, but still maintain competitive prices. Japanese suppliers have thus placed price and quality pressures on domestic producers.

Domestic production capacity for cold-heading and cold-forming quality steel is expected to be maintained at levels adequate to mobilization requirements although some producers may reduce their total rod and bar capability. The companies listed above are expected to remain active in this cold-heading market and probably to emphasize it over ordinary commercial specification rod and bar products. Minimills, which are scrap-based electric furnace rod producers, while very cost competitive with volume steel imports, are not well equipped to produce the quality of steel which cold-heading requires. Few have the furnace controls, the grinding and surface testing equipment or the technical staff to compete effectively in this limited market. Given adequate profit incentives, these smaller mills might initiate the necessary extra procedures and install needed equipment to make such steel; thus they remain a potential domestic resource for such steel if demand expanded sufficiently.

The impact of imported steel has been pervasive on the domestic steel industry in recent years in all product lines. In 1981 imports set a record of 19.1 percent of apparent domestic steel consumption (domestic shipments plus imports minus exports). In 1982 imports will set a new market share record of about 22 percent. Significant moderation of this import pressure is unlikely despite the recent quota agreement with the European Community although some decline in the import share is likely as world steel markets recover. For the categories of steel in which cold-heading stock is included, the following table shows recent trade trends.

Domestic Shipments, Imports and Exports of
Steel Wire, Rods and Bars, 1980-82
(net tons)

Product	Year	Shipments	Imports	Exports	Apparent Consumption	Import Share Apparent Consumption Percent
Wire, (drawn)	1980	1,391,755	395,053	36,552	1,750,257	22.6
	1981	1,318,750	385,020	34,805	1,668,965	23.1
9 mos	1982	812,712	279,504	20,158	1,072,058	26.1
Rod, (Redraw)	1980	2,688,239	829,259	212,347	3,305,151	25.1
	1981	2,997,464	888,442	101,774	3,784,132	23.5
9 mos	1982	1,735,176	648,680	22,071	2,361,785	24.3
HR Bar	1980	5,960,617	495,807	207,380	6,249,044	7.9
	1981	6,628,120	594,572	149,898	7,072,794	8.4
	1982	3,375,429	380,685	65,344	3,690,770	10.3

Source: Shipments; American Iron and Steel Institute; Exports and Imports Department of Commerce, Bureau of Census

The steel industry operated at the following rates of capability:

1980	72.3%
1981	77.6%
1982 (9 mos)	48.1%

In any of the above years all domestic steel needs could have been satisfied from domestic sources. Fastener mobilization demands may be related to the above data.

For there to be imports their prices (and perhaps quality) must be attractive relative to domestic levels. Asian and some newly industrialized countries (NIC) can offer price (and perhaps quality) inducements to domestic steel users without risk of successful intervention by domestic steel producers using the new trade laws. Absent other trade restrictions by the U.S., steel import pressures will continue and domestic steelmaking capacity will decline further. However, the risk of the pressure on cold-heading quality steel capacity is limited. It is not possible to identify in the above trade data cold-heading quality rod, bar, and wire, which are included in the categories shown together with commercial quality products. However, anecdotal reports of domestic cold-heading steel producers indicate that imports, especially from Japan, enjoy a significant share of the domestic market, at relatively high prices. Japanese quality permits penetration of the domestic cold-heading steel market at existing domestic price levels, thus motivating domestic producers to improve their quality and lower prices. Domestic producers are surviving the present levels of competition in this market and this equilibrium is likely to continue, since the very competitive NIC steelmakers are probably some time away from cold-heading quality steelmaking.

The long term outlook for the domestic steel industry is not bright; major changes must occur if it is not to decline significantly. Domestic steel industry hourly labor costs remain much above the average for domestic industry generally and should steel imports and domestic shipments continue at levels which keep the industry in a loss or marginally profitable state, large losses of domestic capacity will result. A major restructuring of the domestic steel industry is now imminent and will be extensive if the eight largest steel producers and the United Steel Workers do not shortly reach an accommodation which involves a substantial moderation of present wages and benefits and their rates of increase. It is probable some accommodation will be reached in mid-1983, but this will not preclude permanent closing of some steelmaking capacity. Domestic labor costs must decline relative to world labor costs. Introduction of new technology and facilities to improve productivity would help. For this modernization to occur capital must be available and for capital to flow toward the steel industry a profit prospect must be attractive. None of these conditions are clearly in sight now. However, cold-heading steel capacity will erode late in any contraction and probably ample time will be available to establish alternatives. We see no near term problem in domestic cold-heading and forging quality steel capacity.

Appendix H. Industry SIC 3452
Bolts, Nuts, Screws, Rivets and Washers

H. Industry SIC 3452 - Bolts, Nuts, Screws, Rivets and Washers

The nuts, bolts, and large screws of iron and steel segment of the industry is part of a larger industry identified by the Census of Manufacturers classification number (SIC) 3452: Bolts, Nuts, Screws, Rivets and Washers, normally referred to as the industrial fasteners industry. In addition to the investigated products and those mentioned in the industry's name, SIC 3452 includes small screws (less than 1/4 inch diameter), mine roof bolts, formed and threaded wire goods made on industrial fastener machines, nonthreaded fasteners such as cotter pins, special industrial fasteners and fastener items made from non-ferrous metals. The nut, bolt and large screw (of iron and steel) segment represents about 45-50 percent of SIC 3452 in terms of weight of shipments; 30-35 percent in terms of the value of shipments; and 10-15 percent in terms of pieces (or units) shipped. Employment in the nut, bolt and large screw (of iron and steel) sector is roughly 25-30 percent of all employees in SIC 3452.

There are 30 different TSUS numbers that conform to the product definitions within SIC 3452 including the five identifying the nuts, bolts and large screws that were investigated. Three of the numbers which were not part of the 232 investigation include mostly nuts, bolts and screws of iron and steel that are imported duty free from Canada under the Automotive Products Trade Act of 1965 for use by the motor vehicle industry. These imports amounted to 49 million pounds with an entry value of $37 million in 1981. These imports would add about seven percent, if included, to the imports of the investigated products in terms of pounds and nine percent to the dollar value.

Imports of all products identified in industry group SIC 3452 amounted to 984 million pounds, valued at $654 million (Customs' value) in 1981. Imports of the nuts, bolts and large screws segment were 677 million pounds, valued at $412 million (Customs' value) in 1981.

Labor Transferability Within Industry SIC 3452

Industry sources report there is transferability of skilled labor from small screw (less than 1/4 inch) manufacture to the production of larger screws but that a retraining period of from three to six months would be required. Small screws, along with other cold formed parts, such as rivets and washers, grouped into industry SIC 3452, use essentially the same technology as their larger counterparts; but on a simpler scale. The switch for a worker from a small cold-heading machine to a multi-station boltmaker or nut former, however, would take longer than the switch to larger screws because of added complexities. Estimates of the time needed to retrain a small screw maker into a boltmaker or nut former range from 10-15 months. There would be less transferability from cold forming to hot forming operations because they are considerably different operations.

The small fastener industry (i.e., SIC 3452, except the investigated products) is nearly twice as labor intensive as the iron and steel nuts, bolts and large screws industry, with labor costs as high as 35-40 percent of total costs. Consequently, it is estimated 25-30,000 production workers, of whom 40 percent are considered to have associated unique and critical skills, are in the small fastener industry. Also, import penetration has not been as severe in the small fastener industry; estimated to be only half as much (at 25-30 percent) as it is for the investigated fasteners. However, over 50 percent of the small screws used in the U.S. are now imported, and like the investigated products, the small screw imports are mostly from Japan.

Transferability of skilled labor within SIC 3452 is feasible. In a mobilization some may be necessary. But as a practical matter the skilled labor in the small fastener industry would also need to be expanded in a mobilization and may not be available for use in the production of iron and steel nuts, bolts, and large screws.

Appendix I. Council of Economic Advisers' Analysis

CEA:1/27/83

An Economic Analysis of Fastener Import Restrictions

Trade restrictions impose hidden costs on the economy. They are not included in the appropriations of elected officials, they show up on no agency's budget, and they tend to be overlooked when assessing the impact of the broader policy of which they are a part. But hidden or not, these costs act as a drag on the rest of the economy, eroding the industrial base in other sectors, and undermining our ability to sustain a balanced defense effort in a national emergency.

In order that these burdens not be overlooked, this paper presents estimates of their magnitude. It is not just the costs which need concern us, however. Costs must be weighed against expected benefits. In this spirit, relevant evidence on the need for shouldering these burdens is reviewed.

The primary conclusions of this analysis are:

- The supply of fasteners is highly responsive to changes in demand. Supply is elastic.

- The demand for fasteners is not very responsive to changes in price. Demand is inelastic.

- Given the large estimates of U.S. wartime requirements reported by FEMA (roughly 75 percent of world fastener capacity) import restrictions imposed under Section 232 cannot increase domestic production sufficiently to eliminate the estimated wartime shortfall. If all fastener imports were prohibited, and if the domestic industry expanded to meet peacetime demand, a shortfall of roughly a billion pounds of fasteners would still remain. Given the assumptions and methodology of the 232 Process, a shortfall is inevitable without massive imports in wartime.

- Fortunately, there is reason to believe that the assumptions and methodology of the 232 Process so overinflate the estimate of wartime demand and so underinflate estimates of wartime supply that no shortfall would actually occur. The complete neglect of price effects in the 232 Process is sufficient to ensure a wartime shortfall of domestic capacity below requirements for almost any commodity.

- Should trade restrictions be imposed, in spite of the doubtful benefits of such a policy, the costs to consumers would be extremely high. A ban on imports would impose an additional burden on domestic uses of fasteners of almost $900 million per year. Less optimistic assumptions about supply elasticity (for example, that supply is inelastic) would double or triple this burden.

Costs of Import Restriction

Domestic production is concentrated in specialized, expensive, high-quality fasteners (hereafter "specials") while imports are primarily cheaper, standardized, high volume fasteners (hereafter "standards"). If imports are cut off for national security reasons, domestic firms will expand output of standards. Although they will not be able to produce standards as inexpensively as foreign producers, they will nevertheless be able to make them at a cost lower than the current cost of producing specials. Data from the November 1981 ITC Report (pp. A-50 to A-53) suggests that the current foreign cost advantage in the production of standards is about 40 percent. At current levels of total fastener production, therefore, eliminating imports would result in an increase in the cost of producing standards of about two thirds.

In addition, costs in the fastener industry would rise as domestic production increased, putting further pressure on prices. Past data indicate that the supply of fasteners is relatively elastic, and that the industry can expand output without substantially increasing the marginal cost of producing additional fasteners. In the estimates presented below, a medium term industry supply elasticity of 3 was assumed.

Because fasteners constitute only a small proportion of the cost of producing the goods in which they are used, demand for fasteners is relatively insensitive to price. Econometric estimates of the elasticity of demand for fasteners have not been significantly different from zero. Therefore, this analysis assumes that the demand elasticity is 0.2.

In estimating the cost to consumers of eliminating imports of fasteners, it is appropriate to use average demand adjusted for trend. I have used a demand of 2 billion pounds and an average price of $1 per pound as the pre restriction case.

The results are summarized below:

Pre restriction average price	$1.00/lb
Pre restriction market size	2 billion lbs
Post restriction average price	$1.45/lb
Post restriction market size	1.857 billion lbs

Additional cost to consumers	$868 million per year
Deadweight loss to economy	$32 million per year
Additional jobs created	11,000
Dollars per job	$79,000 per year
Income transfer from consumers to producers	$836 million per year

Discussion

As imports are cut off, domestic producers switch production capacity from specials to standards as well as increase total output. Average fastener prices rise in response from $1.00 to $1.45. Since fasteners are but a small fraction of the cost of a final good, demand for fasteners diminishes only slightly, and total market size falls from 2 billion pounds to 1.857 billion pounds. Consumers buy almost as many fasteners as before the import cut-off, but at a much higher price. In the longer run the additional cost to consumes would fall as the maket stabilized, perhaps to around $400 million per year.

In addition to these direct costs there are substantial indirect costs which are more difficult to measure. Restricting imports in one sector means that imports must rise in another sector in order to reestablish a balanced current account. To the extent that this forces a reallocation of resources from efficient to inefficient use there is a net welfare loss to the overall economy. If the export sector as a whole is more labor intensive than the fastener industry, there would be a net loss in jobs in spite of the direct employment gains in the fastener industry. If the export sector includes industries important to national defense, trade restrictions on fasteners could reduce overall defense capability.

It might be argued that an elastic supply curve is inappropriate for generating consumer cost estimates as the whole 232 case is predicated on the assumption that supply is not responsive to changes in demand; were the supply curve elastic there would be no wartime shortage and no national security issue. Yet past data convincingly supports an elastic supply; in no period of its history, wartime or peacetime, has the U.S. ever experienced a prolonged fastener shortage. Even in the wake of the Great Depression fastener production doubled in the first two years of World War II, and comparable increases in production followed U.S. entry into both Korea and Vietnam. Attached is the relevant past data.

The fastener industry claims that the large supply response during World War II was possible because "the industry must have had, prior to the depression coming through and into World War II, a significant installed capacity which enabled it to meet the surge requirement." It is hard to imagine, however, idle machines and workers lasting through eleven long depression years, waiting only for the factory gates to be

unlocked the morning after Pearl Harbor. Were the fastener industry this resistent to economic pressure, no trade cases would ever have been filed.

If we were to ignore the historical record and assume a less responsive domestic supply, the consequence would be geometrically escalating consumer costs. A supply elasticity of one, for example, raises the consumer costs from $868 million to $1.942 billion per year.

Other Issues

The CEA was tasked by the Resource Assessment Division of Commerce to discuss: (1) the impact on the economy of an additional significant switch from domestic to overseas production of fasteners; and (2) the economic impact if Department of Defense procurement were restricted to domestic supply.

1) An additional switch to imported fasteners would involve both losses and gains for the domestic economy. On the losses side, each one percent increase in the quantity of fasteners imported entails the direct loss of about 220 U.S. fastener jobs and the earnings from these jobs when total fastener demand stays constant. On the gains side would be lower costs to U.S. consumers of final products for which fasteners are an input, increased competitiveness in industries which use fasteners, increased jobs and earnings in sectors which ship or handle the imports, increased jobs and earnings in the export sector as a whole, and benefits from switching resources to areas where they are more productive. In general, gains from trade outweigh the losses, and the greater the divergence of marginal cost between countries, the greater the potential net gains from trade. Insofar as Japan, and more recently the rapidly developing countries of the Pacific, have a comparative advantage in the production of standards, both past realized as well as future potential net gains from trade should be large.

2) While no hard data exists, it seems that defense production relies almost entirely on domestic sources of fasteners. Military uses tend to require the more specialized fasteners now produced in the U.S. Restricting defense procurement to domestic production would require defense contractors to document their current practice, but would have a negligible economic impact.

Concluding Remarks

The benefits claimed for import restrictions rely on many implausible but unexamined assumptions (assumptions about wartime requirements, domesic capacity, fastener importance to the defense effort, etc.), so it is appropriate to comment briefly on these by way of conclusion.

- The wartime shortfall estimates depend on both estimated capacity and estimated requirements. Both of these are treated by the 232 Process as somehow fixed and immutable, with no supply or demand elasticity and no substitution by either defense or civilian consumers. If the price of fasteners were a billion dollars per pound, supply and demand would be unchanged. This is clearly unrealistic.

- The majority of industrial fasteners go into the production of consumer durables. In World War II, expenditures on consumer durables fell to 42 percent of trend. Current estimates of requirements assume that mobilization and wartime expenditures on consumer durables averages 82 percent of trend. Thus, even accounting for key structural differences between present and past consumption patterns, projected exenditures on consumer durables seems inflated by almost a factor of 2. This, in turn, would bias estimates of fastener requirements upwards. Had more modest levels of expenditures on consumer durables been assumed, the projected shortfall may have been reduced by as much as 50 percent.

- Capacity estimates seem to be calculated as a constant multiple of producers' shipments and bear no relation to actual supply dynamics. As noted, past experience shows that fastener supply is quite elastic.

For all of these reasons it is likely that there is nothing to be gained from restricting imports of fasteners. It is highly unlikely that the U.S. would run out of fasteners before any potential adversary or combination of adversaries. There is, however, a possibility that trade restrictions would have a perverse effect on national security. To the extent that fastener imports are excluded, domestic producers are encouraged to switch production away from the specials used by the defense industry and into the standards used by the non-defense sectors. This might weaken U.S. ability to increase arms production quickly in time of national emergency. There is no justification for import restriction or tariff relief.

1946	747,000	183,762,000	
1947	988,000	302,328,000	
1948	1,000,000	351,000,000	
1949	736,000	283,360,000	
1950	939,000	383,112,000	

STEEL PRODUCTION AND BNR SHIPMENTS

Year	Steel Ingot Production N.T.	Finished Hot Rolled Iron & Steel Production N.T.	Estimated Bolt, Nut & Rivet Shipments N.T.	Estimated Bolt, Nut & Rivet Shipments Dollars	Estimated Bolt, Nut & Rivet Shipments Value per Ton	% Fin. to Ingot 2/1	% BNR Tons to Fin. 3/2
1926	52,568,550	39,755,399	na	na	na	75.6	na
1927	49,029,923	36,824,515	584,400	75,241,000	$129	75.1	1.59
1928	56,364,440	42,182,466	601,300	79,492,000	132	74.8	1.43
1929	61,432,485	45,997,746	736,200	94,644,000	129	74.9	1.60
1930	44,346,700	33,054,568	526,800	64,312,000	122	74.5	1.59
1931	28,480,393	21,477,001	311,700	35,519,000	114	75.4	1.45
1932	15,080,130	11,705,219	173,200	18,612,000	107	77.6	1.48
1933	25,641,600	18,743,296	271,500	29,768,000	110	73.1	1.45
1934	29,062,593	21,245,847	308,100	37,333,000	121	73.1	1.45
1935	38,013,298	26,840,298	359,800	42,304,000	118	70.6	1.34
1936	53,214,346	37,857,544	534,900	61,010,000	114	71.1	1.41
1937	56,356,329	41,178,356	555,300	78,500,000	141	73.1	1.35
1938	31,596,142	23,568,951	268,400	39,440,000	147	74.4	1.14
1939	52,537,439	39,067,553	432,000	58,700,000	136	74.2	1.11
1940	66,649,864	48,660,369	491,000	68,934,000	140	73.1	1.01
1941	82,434,367	62,324,187	785,600	124,081,000	158	75.6	1.26
1942	85,546,176	62,445,914	942,700	169,686,000	180	73.0	1.51
1943	88,385,002	63,292,673	942,700	188,540,000	200	71.6	1.49
1944	89,242,015	65,743,084	923,800	184,760,000	200	75.0	1.38
1945	79,701,624	62,242,435	831,400	157,046,000	189	78.1	1.33

na (not available)

SOURCE: Steel Prod., Am. I&S Inst.
BNR Ship., Am. BN&R Mfrs.

2/26/45

(2533)

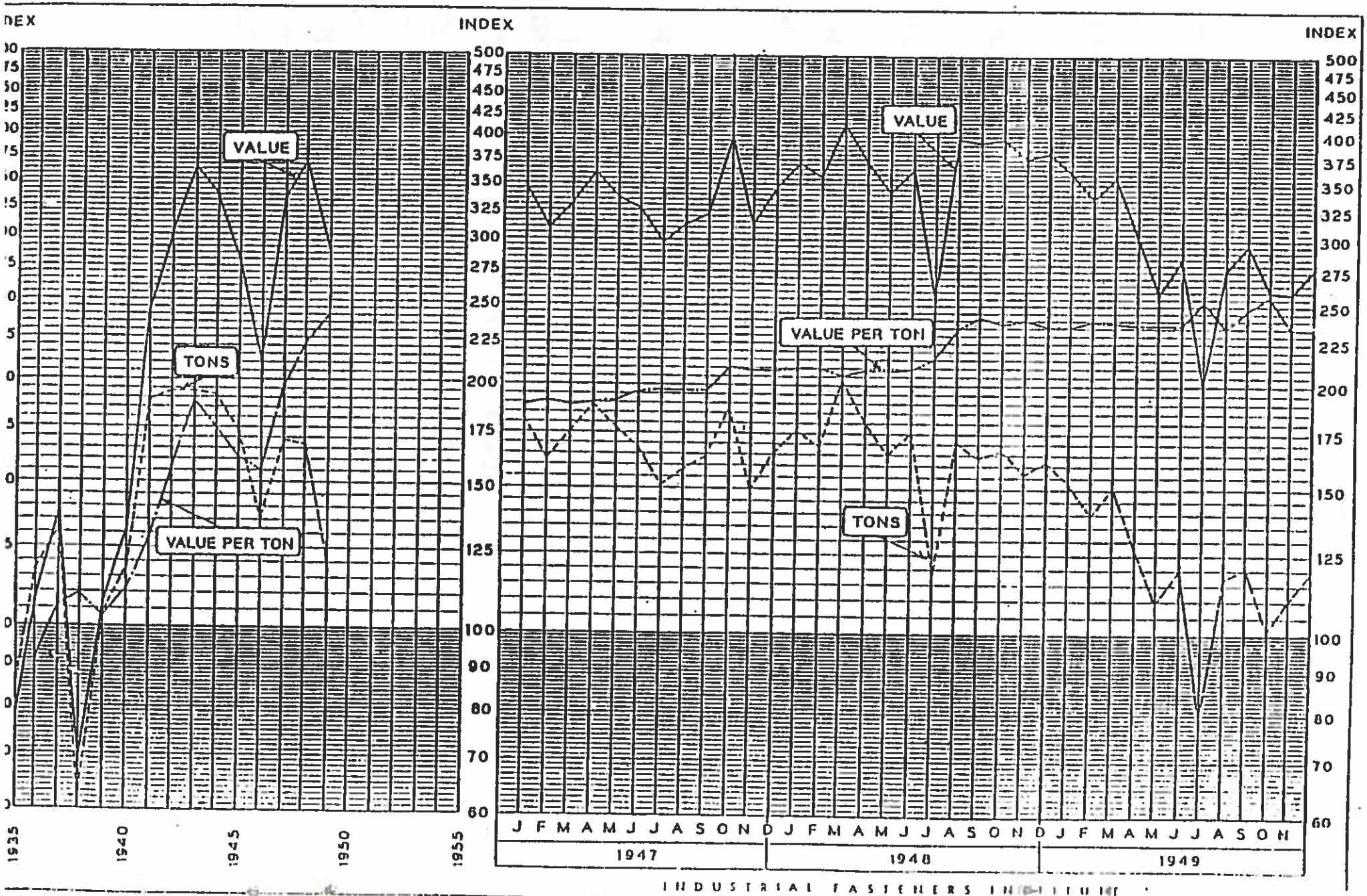
Prepared by

American Institute of Bolt, Nut and Rivet Manufacturers
1550 Hanna Building Cleveland 15, Ohio

SHIPMENTS OF HEADED AND THREADED PRODUCTS INDEX

DOMESTIC SHIPMENTS ONLY - FERROUS AND NON-FERROUS

1935-1939 AVERAGE = 100



Appendix J. References

8. References

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   Ridgefield, CT

Appendix K. Tables

U.S. Department of Commerce
Office of Industrial Resource Administration

Table 1.—U.S. Imports for Consumption[1] —Nuts, Bolts and Large Screws

Year	Lag screws		Bolts		Cap screws >.24"		Other screws
	(000 lbs.)	(000 $)	(000 lbs.)	(000 $)	(000 lbs.)	(000 $)	(000 lbs.)
1969	12,225.2	1,152.2	123,252.4	16,033.7	54,046.6	11,064.1	16,838.8
1970	14,648.7	1,792.2	125,089.0	20,158.0	62,444.2	14,039.0	22,447.1
1971	9,135.3	1,050.1	128,903.9	20,474.4	57,767.5	11,720.5	20,026.3
1972	16,553.8	2,061.5	157,254.7	25,973.9	72,832.0	18,051.6	32,741.5
1973	19,957.0	3,691.1	166,813.4	36,670.3	105,063.0	30,668.8	37,204.6
1974	15,077.5	4,126.2	226,493.3	94,238.9	195,305.7	103,658.8	37,952.5
1975	7,138.8	2,713.1	140,644.6	55,903.2	170,361.0	65,615.0	11,567.7
1976	19,347.1	7,081.9	194,369.5	63,560.2	243,987.0	81,267.1	16,381.5
1977	18,296.6	6,425.1	219,921.4	76,664.5	232,585.2	85,256.5	16,620.9
1978	16,405.0	7,315.9	238,307.0	95,508.0	280,208.1	112,286.7	16,403.2
1979	18,834.9	9,403.3	192,980.5	101,266.2	292,189.4	141,173.6	13,891.2
1980	16,764.4	8,155.8	149,643.2	88,085.3	276,250.2	135,448.4	14,764.7
1981	20,283.8	10,260.7	146,021.6	89,790.9	240,413.7	119,336.0	14,889.1
Jan.-June 1981	9,713.1	5,060.6	72,369.1	45,809.6	112,302.6	56,703.2	6,763.0
Jan.-June 1982	9,673.1	4,675.2	88,651.2	47,458.0	126,515.2	61,167.0	7,624.5

Year	Other Screws	Total bolts and large screws		Nuts		Total fasteners	
	(000 $)	(000 lbs.)	(000 $)	(000 lbs.)	(000 $)	(000 lbs.)	(000 $)
1969	3,253.2	206,363.0	31,503.2	165,661.3	32,192.8	372,024.3	63,696.0
1970	3,421.5	224,629.0	39,410.7	176,062.2	39,979.9	400,691.2	79,390.6
1971	2,602.9	215,833.0	35,847.9	163,415.5	35,846.3	379,248.5	71,694.2
1972	5,483.9	279,382.0	51,570.9	194,812.2	47,722.4	474,194.2	99,293.3
1973	6,944.7	329,038.0	77,974.9	215,790.2	70,913.1	544,828.2	148,888.0
1974	10,926.8	474,829.0	212,950.7	301,613.5	191,448.7	776,442.5	404,399.4
1975	7,112.3	329,712.1	131,343.6	205,038.3	102,800.8	534,750.4	234,144.4
1976	8,845.6	474,085.1	160,754.8	230,390.2	98,420.4	704,475.3	259,175.2
1977	11,426.9	487,424.1	179,773.0	223,862.5	107,668.4	711,286.6	287,441.4
1978	14,556.5	551,323.3	229,667.1	297,989.9	164,921.6	849,313.2	394,588.7
1979	15,703.7	517,896.0	267,546.8	275,086.8	192,947.5	792,982.8	460,494.3
1980	17,300.1	457,422.5	248,989.6	221,122.4	156,756.6	678,544.9	405,746.2
1981	18,046.3	421,608.2	237,433.9	255,786.4	174,288.0	677,394.6	411,721.9
Jan.-June 1981	8,650.7	201,147.8	116,224.1	119,824.3	85,232.4	320,972.1	201,456.5
Jan.-June 1982	9,117.0	232,464.0	122,417.2	131,219.2	77,935.1	363,683.2	200,352.3

[1] For years 1969-1974 imports (000 lbs.) of lag screws, cap screws over .24 inch in diameter and other screws over .24 inch in diameter were recorded by Bureau of the Census in gross pieces (144). Data provided by the Industrial Fastener Institute (IFI) permitted investigators to convert import data into pounds.

For years 1974-1981 dollar value of imports includes C.I.F. value and estimated import duties.

Sources: Bureau of the Census and the Industrial Fastener Institute (IFI).

U.S. Department of Commerce
Office of Industrial Resource Administration

Table 2.— Nuts, Bolts and Large Screws: Total U.S. Producers' Shipments, Imports, Exports and U.S. Apparent Consumption, 1969-June 1982 (Quantity - 000 lbs.)

Year	U.S. producers' shipments[1]	Imports	Exports	U.S. apparent consumption	Ratio of imports to—	
					Producer shipments	U.S. apparent consumption
	Quantity (000 lbs.)					
1969	1,490,373	372,024	95,048	1,767,349	25.0	21.0
1970	1,372,922	400,691	89,148	1,684,465	29.2	23.8
1971	1,247,002	379,248	83,227	1,543,023	30.4	24.6
1972	1,422,326	474,194	102,045	1,794,475	33.3	26.4
1973	1,506,087	544,828	124,395	1,926,520	36.2	28.3
1974	1,554,245	776,443	159,152	2,171,536	50.0	35.8
1975	1,050,140	534,750	172,486	1,412,404	50.9	37.9
1976	1,133,952	704,475	197,269	1,641,158	62.1	42.9
1977	1,175,563	711,287	218,265	1,668,585	60.5	42.6
1978	1,442,402	849,313	217,252	2,074,463	58.9	40.9
1979	1,547,946	792,983	199,015	2,141,914	51.2	37.0
1980	1,065,567	678,545	119,923	1,624,189	63.7	41.8
1981	965,306	677,394	147,531	1,495,169	70.2	45.3
Jan.-June 1981	559,997	320,972	94,490	786,479	57.3	40.8
Jan.-June 1982	407,935	363,683	94,579	677,039	89.2	53.7

[1] 1978-1980 data extrapolated from USITC Publication #1193 Statistics (November 1981).

Sources: U.S. International Trade Commission (Reports to the President on Investigation No. TA-201-37 (USITC Publication 924) and Investigation No. TA-203-11 (USITC Publication 1193)), Bureau of the Census, and Department of Commerce Section 232 Investigation.

U.S. Department of Commerce
Office of Industrial Resource Administration

Table 3.—Nuts, Bolts and Large Screws: Total U.S. Producers' Shipments, Imports, Exports and U.S. Apparent Consumption, 1969-June 1982 (Value - 000 $)

Year	U.S. Producers' shipments[1]	Imports[2]	Exports	U.S. apparent consumption	Ratio of imports to—	
					Producer shipments	U.S. apparent consumption
	Value (000 Dollars)					
1969 ...	736,868	63,696	46,503	754,061	8.6	8.4
1970 ...	672,809	79,391	45,376	706,824	11.8	11.2
1971 ...	663,576	71,694	44,691	690,579	10.8	10.4
1972 ...	771,397	99,293	51,436	819,254	12.9	12.1
1973 ...	909,671	148,888	66,042	992,373	16.4	15.0
1974 ...	1,184,336	404,399	95,732	1,493,003	34.1	27.1
1975 ...	947,450	231,144	101,251	1,077,343	24.4	21.5
1976 ...	986,432	259,175	107,055	1,138,552	26.3	22.8
1977 ...	1,074,609	287,441	114,252	1,247,798	26.7	23.0
1978 ...	1,141,585	394,589	122,726	1,413,448	34.6	27.9
1979 ...	1,415,439	460,494	130,387	1,745,546	32.5	26.4
1980 ...	1,238,315	405,746	139,136	1,504,925	32.8	27.0
1981 ...	1,068,766	411,722	151,278	1,329,210	38.5	31.0
Jan.-June 1981 ...	592,900	201,457	78,230	716,127	34.0	28.1
Jan.-June 1982 ...	403,394	200,352	68,784	534,962	49.7	37.5

[1] U.S. Producers' Shipments" include U.S.-made nuts, bolts and large screws that are shipped to domestic customers, exported, or transferred within the company for use in the manufacture of other products. 1978-1980 data extrapolated from USITC Publication 1193 Statistics.

[2] Value of imports, 1974-1982, includes C.I.F. value and estimated import duties.

Sources: U.S. International Trade Commission (Reports to the President of Investigation No. TA-201-37 (USITC Publication 924) and Investigation No. TA-203-11 (USITC Publication 1193)), Bureau of the Census, and Department of Commerce Section 232 Investigation.

U.S. Department of Commerce
Office of U.S. Industrial Resource Administration

Table 4.—Nuts, Bolts and Large Screws: U.S. Producer Shipments, Imports, Exports and U.S. Apparent Consumption, 1969-June 1982 (Quantity - 000 lbs.)

Type of fastener and year	U.S. producers' shipments[1]	Imports	Exports	U.S. apparent consumption	Ratio (percent) of imports to—	
					Producer shipments	Apparent consumption
	Quantity (000 lbs.)					
Bolts and large screws:[2]						
1969	1,150,066	206,363	81,914	1,274,515	17.9	16.2
1970	1,074,638	224,629	77,457	1,221,540	20.9	18.4
1971	983,467	215,833	71,667	1,127,633	21.9	19.1
1972	1,119,237	279,382	84,355	1,314,264	25.0	21.3
1973	1,197,013	329,038	102,665	1,423,386	27.5	23.1
1974	1,242,072	474,829	127,350	1,589,551	38.2	29.9
1975	852,064	329,712	129,006	1,052,770	38.7	31.3
1976	912,072	474,085	150,078	1,236,079	52.0	38.4
1977	950,607	487,424	166,203	1,271,828	51.3	38.3
1978	1,164,393	551,323	159,096	1,556,620	47.3	35.4
1979	1,236,374	517,896	141,309	1,612,961	41.9	32.1
1980	860,703	457,423	94,238	1,223,888	53.1	37.4
1981	778,565	421,608	118,955	1,081,218	54.2	39.0
Jan.-June 1981	454,750	201,148	60,081	595,817	44.2	33.8
Jan.-June 1982	333,016	232,464	80,854	484,626	69.8	48.0
Nuts:						
1969	340,307	165,661	13,134	492,834	48.7	33.6
1970	298,284	176,062	11,691	462,655	59.0	38.1
1971	263,535	163,415	11,560	415,390	62.0	39.3
1972	303,089	194,812	17,690	480,211	64.3	40.1
1973	309,074	215,525	21,730	502,869	69.7	42.9
1974	312,173	301,613	31,802	581,984	96.6	51.9
1975	198,076	205,038	43,480	359,634	103.5	57.0
1976	221,880	230,390	47,191	405,079	103.8	56.9
1977	224,956	225,776	52,062	398,670	100.4	56.6
1978	278,009	297,990	58,156	517,843	107.2	57.5
1979	311,572	275,089	57,706	528,955	88.3	52.0
1980	204,864	221,122	25,685	400,301	107.9	55.2
1981	186,741	255,786	29,754	412,773	137.0	62.0
Jan.-June 1981	105,247	119,824	15,444	209,627	113.9	57.2
Jan.-June 1982	74,919	131,219	14,526	191,612	175.1	68.5

[1] "U.S. Producers' Shipments" include U.S.-made nuts, bolts and large screws that are shipped to domestic customers, exported, or transferred within the company for use in the manufacture of other products. 1978-1980 data extrapolated from USITC Publication 1193 Statistics.

[2] "Bolts and Large Screws" include lag screws and exclude mine-roof bolts.

Sources: U.S. International Trade Commission (Reports to the President on Investigation No. TA-201-37 (USITC Publication 924) and Investigation No. TA-203-11 (USITC Publication 1193), Bureau of the Census and Department of Commerce Section 232 Investigation.

U.S. Department of Commerce
Office of Industrial Resource Administration

Table 5.—Nuts, Bolts and Large Screws: Producer Shipments, Imports, Exports and U.S. Apparent Consumption, 1969-June 1982 (Value - 000 $)

Type of fasteners and year	U.S. producers' shipments[1]	Imports[2]	Exports	U.S. apparent consumption	Ratio (percent) of imports to—	
					Producar shipments	U.S. apparent consumption
	Value (000 Dollars)					
Bolts and large screws:[3]						
1969	545,131	31,503	36,856	539,778	5.8	5.8
1970	500,781	39,411	36,692	503,500	7.9	7.8
1971	493,700	35,848	35,317	494,231	7.3	7.3
1972	568,572	51,571	40,114	580,029	9.1	8.9
1973	661,948	77,975	51,429	688,494	11.8	11.3
1974	850,819	212,951	73,196	990,574	11.1	21.5
1975	684,207	131,344	77,930	737,621	19.2	17.8
1976	702,426	160,755	83,125	780,056	22.9	20.6
1977	779,917	179,773	87,100	872,590	23.1	20.6
1978	798,530	229,667	92,067	936,130	28.8	24.5
1979	959,830	267,547	96,674	1,130,703	27.9	23.7
1980	851,048	248,990	107,412	992,626	29.3	25.1
1981	719,350	237,434	115,238	841,546	33.0	28.2
Jan.-June 1981	390,931	116,224	57,457	449,698	29.7	25.8
Jan.-June 1982	280,939	122,416	55,679	347,676	43.6	35.2
Nuts:						
1969	191,737	32,193	9,647	214,283	16.8	15.0
1970	172,028	39,980	8,684	203,324	23.2	19.7
1971	169,876	35,846	9,374	196,348	21.1	18.3
1972	202,825	47,722	11,322	239,225	23.5	19.9
1973	247,723	70,913	14,613	304,023	28.6	23.3
1974	333,517	191,449	22,536	502,430	57.4	38.1
1975	263,243	102,801	23,321	342,723	39.1	30.0
1976	284,006	98,420	23,930	358,496	34.7	27.5
1977	294, 692	107,668	27,152	375,208	36.5	28.7
1978	343,055	164,922	30,659	466,227	48.1	35.4
1979	455,609	192,948	33,713	522,964	42.3	36.9
1980	387,267	156,757	31,724	430,036	40.5	36.5
1981	349,416	174,288	36,043	487,661	49.9	35.7
Jan.-June 1981	201,969	85,232	20,776	266,425	42.2	32.0
Jan.-June 1982	122,455	77,935	13,106	187,284	63.6	41.6

[1] "U.S. Producers' Shipments" include U.S.-made nuts, bolts and large screws that are shipped to domestic customers, exported, or transferred within the company for use in the manufacture of other products. 1978-1980 data extrapolated from USITC Publication 1193 Statistics.
[2] Value of imports, 1974-1982, includes C.I.F. value and estimated import duties.
[3] "Bolts and Large Screws" include lag screws and exclude mine-roof bolts.

Sources: U.S. International Trade Commission (Reports to the President on Investigation No. TA-201-37 (USITC Publication 924) and Investigation No. TA-203-11 (USITC Publication 1193)), Bureau of the Census, and Department of Commerce Section 232 Investigation.

U.S. Department of Commerce
Office of Industrial Resource Administration

Table 6.—Nuts, Bolts and Large Screws: Estimated U.S. Producer Shipments, Imports, Exports and U.S. Apparent Consumption, 1969-June 1982 (Quantity - Millions of Pieces)

Type of fastener and year	U.S. producers' shipments[1]	Imports	Exports	U.S. apparent consumption	Ratio (percent) of imports to—	
					Producer shipments	Apparent consumption
	Quantity (Mil. Pieces)					
Bolts and large screws:[2]						
1969	10,398.2	3,393.1	1,346.8	12,444.5	32.63	27.27
1970	9,510.1	3,693.4	1,273.6	11,929.9	38.84	30.96
1971	8,640.0	3,548.8	1,178.4	11,010.4	41.07	32.23
1972	9,625.9	4,593.7	1,387.0	12,832.6	47.72	35.80
1973	10,176.0	5,410.1	1,688.0	13,898.1	53.17	38.93
1974	9,807.3	7,807.2	2,093.9	15,520.6	79.61	50.30
1975	6,979.0	5,421.2	2,121.1	10,279.1	77.69	52.74
1976	6,741.8	7,795.0	2,467.6	12,069.2	115.62	64.59
1977	7,136.7	8,014.3	2,732.7	12,418.3	112.30	64.54
1978	9,039.3	8,775.6	2,615.9	15,199.0	97.08	57.74
1979	10,131.2	7,941.4	2,323.4	15,749.2	78.39	50.42
1980	6,728.6	6,771.1	1,549.5	11,950.2	100.63	56.66
1981	7,017.4	6,036.3	1,955.9	11,097.8	86.02	54.39
Jan.-June 1981	4,016.4	2,879.9	987.9	5,908.4	71.70	48.74
Jan.-June 1982	3,321.3	3,224.7	1,329.4	5,216.6	97.09	61.82
Nuts:						
1969	6,181.3	3,346.1	265.3	9,262.1	54.13	36.13
1970	5,374.7	3,556.5	236.2	8,695.0	66.17	40.90
1971	4,739.2	3,301.0	233.5	7,806.7	69.65	42.28
1972	5,447.0	3,935.2	357.3	9,024.9	72.25	43.60
1973	5,536.0	4,353.6	438.9	9,450.7	78.64	46.07
1974	5,487.4	6,092.6	642.4	10,937.6	111.03	55.70
1975	3,495.3	4,141.8	878.3	6,758.8	118.50	61.28
1976	3,912.3	4,653.9	953.3	7,612.9	118.96	61.13
1977	3,986.2	4,522.0	1,051.7	7,456.5	113.44	60.65
1978	4,887.5	6,019.4	1,174.8	9,732.1	123.16	61.85
1979	5,549.8	5,556.8	1,165.7	9,940.9	100.13	55.90
1980	3,575.2	4,466.7	518.8	7,523.1	124.94	59.37
1981	2,590.6	5,166.9	601.0	7,757.3	161.89	66.61
Jan.-June 1981	1,481.9	2,420.4	312.0	3,902.3	134.92	62.02
Jan.-June 1982	950.5	2,650.6	293.4	3,601.1	213.09	73.61

[1] "U.S. Producers' Shipments" include U.S.-made nuts, bolts and large screws that are shipped to domestic customers, exported, or transferred within the company for use in the manufacture of other products.

[2] "Bolts and Large Screws" include lag screws and exclude mine-roof bolts.

Sources: Data extrapolated from statistics by the U.S. International Trade Commission (Reports to the President on Investigation No. TA-201-37 (USITC Publication 924) and Investigation No. TA-201-11 (USITC Publication 1193)), Bureau of the Census, U.S. Department of Commerce Section 232 Investigation, and the Industrial Fastener Institute (IFI).

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Office of Industrial Resource Administration

Table 7.—Standard and Special Nuts, Bolts and Large Screws: Estimated Domestic Shipments, Imports, U.S. Apparent Consumption and Import Penetration, 1969-June 1982 (Quantity - Millions of Pieces)

Type of fastener and year	Standards[1]			Specials[2]			Imports as a percent of U.S. apparent consumption	
	Domestic shipments[3]	Imports	U.S. apparent consumption	Domestic shipments[3]	Imports	U.S. apparent consumption	Standards	Specials
	Millions of pieces						Percent	
Bolts and large screws:[4]								
1969 . . .	5,194.0	3,206.5	8,400.5	3,857.4	186.6	4,044.0	38.2	4.6
1970 . . .	4,759.8	3,471.8	8,231.6	3,476.7	221.6	3,698.3	42.2	6.0
1971 . . .	4,389.2	3,318.1	7,707.3	3,072.4	230.7	3,303.1	43.0	7.0
1972 . . .	4,389.9	4,272.1	8,662.0	3,849.0	321.6	4,170.6	49.3	7.7
1973 . . .	4,168.4	5,004.3	9,172.7	4,319.6	405.8	4,725.4	54.6	8.6
1974 . . .	2,905.8	7,182.6	10,088.4	4,807.6	624.6	5,432.2	71.2	11.5
1975 . . .	2,235.0	4,960.4	7,195.4	2,622.9	460.8	3,083.7	54.9	14.9
1976 . . .	1,355.0	7,093.4	8,448.4	2,919.2	701.6	3,620.8	84.0	19.4
1977 . . .	1,315.7	7,252.9	8,568.6	3,088.3	761.4	3,849.7	84.6	19.8
1978 . . .	1,981.4	7,898.0	9,879.4	4,442.0	877.6	5,319.6	79.9	16.5
1979 . . .	3,129.4	7,107.5	10,237.0	4,678.4	833.8	5,512.2	69.4	15.1
1980 . . .	2,338.8	6,026.3	8,365.1	2,840.3	744.8	3,585.1	72.0	20.8
1981 . . .	2,426.4	5,342.1	7,768.5	2,635.1	694.2	3,329.3	68.8	20.9
Jan.-June 1981 . . .	1,511.5	2,548.7	4,060.2	1,486.4	331.2	1,817.6	62.8	18.2
Jan.-June 1982 . . .	813.9	2,837.7	3,651.6	1,178.0	387.0	1,565.0	77.7	24.7
Nuts:								
1969 . . .	3,089.8	3,162.1	6,251.9	2,826.2	184.0	3,010.2	50.6	6.1
1970 . . .	2,656.5	3,343.1	5,999.6	2,482.0	213.4	2,695.4	55.7	7.9
1971 . . .	2,378.3	3,086.4	5,464.7	2,127.4	214.6	2,342.0	56.5	9.2
1972 . . .	2,432.1	3,659.7	6,091.8	2,651.6	275.5	2,933.1	60.1	9.4
1973 . . .	2,210.4	4,027.1	6,237.5	2,886.7	326.5	3,213.2	64.6	10.2
1974 . . .	1,504.2	5,605.2	7,109.4	3,340.8	487.4	3,828.2	78.8	12.7
1975 . . .	940.9	3,789.7	4,730.6	1,676.1	352.1	2,028.2	80.1	17.4
1976 . . .	1,094.0	4,235.0	5,329.0	1,865.0	418.9	2,283.9	79.5	18.3
1977 . . .	1,052.6	4,092.4	5,145.0	1,881.9	429.6	2,311.5	79.5	18.6
1978 . . .	908.4	5,417.5	6,325.9	2,804.3	601.9	3,406.2	85.6	17.7
1979 . . .	1,488.3	4,973.3	6,461.6	2,895.8	583.5	3,479.3	77.0	16.8
1980 . . .	1,290.8	3,975.4	5,266.2	1,765.6	491.3	2,256.9	75.5	21.8
1981 . . .	857.6	4,572.7	5,430.3	1,733.0	594.2	2,327.2	84.2	25.5
Jan.-June 1981 . . .	557.8	2,142.1	2,699.9	901.4	278.4	1,179.8	79.3	23.6
Jan.-June 1982 . . .	188.3	2,332.5	2,520.8	762.2	318.1	1,080.3	92.5	29.4

[1] Standard fasteners are multi-purpose products which can usually be referenced from accepted and published industry sources, and can be produced and held in inventory.

[2] Special fasteners are designed and produced to fit a particular purchaser's requirements and generally have at least one characteristic which cannot be referenced from published standards.

[3] "Domestic Shipments" include U.S.-made nuts, bolts and large screws that are shipped to domestic customers or are transferred within the company for use in the manufacture of other products.

[4] "Bolts and large screws" include lag screws and exclude mine-roof bolts.

Sources: Data extrapolated from statistics supplied by the U.S. International Trade Commission (Reports to the President on Investigation No. TA-201-37 (USITC Publication 924) and Investigation No. TA-201-11 (USITC Publication 1193)), Bureau of the Census, U.S. Department of Commerce Section 232 Investigation, and the Industrial Fastener Institute (IFI).

U.S. Department of Commerce
Office of Industrial Resource Administration

Table 8.—Standard and Special Nuts, Bolts and Large Screws: Estimated Domestic Shipments, Imports, U.S. Apparent Consumption and Import Penetration, 1969-June 1982 (Quantity - 000 lbs.)

Type of fastener and year	Standards[1]			Specials[2]			Imports as a percent of U.S. apparent consumption	
	Domestic shipments[3]	Imports	U.S. apparent consumption	Domestic shipments[3]	Imports	U.S. apparent consumption	Standards	Specials
	Quantity (000 lbs.)						Percent	
Bolts and large screws:[4]								
1969	665,379.1	195,013.4	860,392.5	402,772.9	11,349.6	414,122.5	22.7	2.7
1970	631,897.6	211,151.3	843,048.9	365,283.4	13,477.7	378,761.1	25.0	3.6
1971	587,539.2	201,803.9	789,343.1	324,260.8	14,029.1	338,289.9	25.6	4.1
1972	627,302.9	259,825.3	887,128.2	407,579.1	19,556.7	427,135.8	29.3	4.6
1973	635,074.7	304,360.1	939,434.8	459,273.3	24,677.9	483,951.2	32.4	5.1
1974	596,365.5	436,842.7	1,033,208.2	518,356.5	37,986.3	556,342.8	42.3	6.8
1975	435,252.5	301,686.5	736,939.0	287,805.5	28,025.5	315,831.0	40.9	8.9
1976	433,838.2	431,416.4	865,254.6	328,155.8	42,667.6	370,823.4	49.9	11.5
1977	436,442.6	441,118.7	877,561.3	347,961.4	46,305.3	394,266.7	50.3	11.7
1978	515,609.0	496,190.7	1,011,799.7	489,688.0	55,132.3	544,815.3	49.0	10.1
1979	584,908.1	463,516.9	1,048,425.0	510,157.9	54,379.1	564,537.0	44.2	9.6
1980	449,615.7	407,106.5	856,722.2	316,850.3	50,316.5	367,166.8	47.5	13.7
1981	383,729.5	373,123.1	756,853.6	275,880.5	48,484.9	324,365.4	49.3	14.9
Jan.-June 1981	239,055.9	178,016.0	417,071.9	155,613.1	23,132.0	178,745.1	42.7	12.9
Jan.-June 1982	134,669.9	204,568.3	339,238.2	117,492.1	27,895.7	145,387.8	60.3	19.2
Nuts:								
1969	176,113.4	156,549.6	332,663.0	151,059.6	9,111.4	160,171.0	47.1	5.7
1970	153,733.7	165,498.3	319,232.0	132,859.3	10,563.7	143,423.0	51.8	7.4
1971	137,980.0	152,793.0	290,773.0	113,995.0	10,622.0	124,617.0	52.5	8.5
1972	142,967.2	181,176.2	324,142.4	142,431.8	13,636.8	156,068.6	55.9	8.7
1973	132,532.9	199,360.6	331,893.5	154,811.1	16,164.4	170,975.5	60.1	9.4
1974	100,805.6	277,484.0	378,289.6	179,565.4	24,129.0	203,694.4	73.3	11.8
1975	64,134.0	187,609.8	251,743.8	90,462.0	17,428.2	107,890.2	74.5	16.1
1976	73,900.4	209,654.9	283,555.3	100,788.6	20,735.1	121,523.7	73.9	17.1
1977	71,166.3	202,596.0	273,762.3	101,727.7	21,267.0	121,994.7	74.0	17.3
1978	68,406.9	268,191.0	336,597.9	151,446.1	29,799.0	181,245.1	79.7	16.4
1979	97,616.6	246,202.9	343,819.5	156,249.4	28,884.1	185,133.5	71.6	15.6
1980	83,412.1	196,798.6	280,210.7	95,766.9	24,323.4	120,090.3	70.2	20.3
1981	62,570.5	226,370.6	288,941.1	94,416.5	29,415.4	123,831.9	78.3	23.8
Jan.-June 1981	40,694.7	106,044.2	146,738.9	49,108.3	13,779.8	62,888.1	72.3	21.9
Jan.-June 1982	18,655.7	115,472.7	134,128.4	41,737.3	15,746.3	57,483.6	86.1	27.4

[1] Standard fasteners are multi-purpose products which can usually be referenced from accepted and published industry sources and can be held in inventory.

[2] Special fasteners are designed and produced to fit a particular purchaser's requirements and have at least one characteristic which cannot be referenced from published standards.

[3] "Domestic Shipments include U.S.-made nuts, bolts and large screws that are shipped to domestic customers or are tranferred within the company for use in the manufacture of other products.

[4] "Bolts and large screws" include lag screws and exclude mine-roof bolts.

Sources: Data extrapolated from statistics supplied by the U.S. International Trade Commission (Reports to the President on Investigation No. TA-201-37 (USITC Publication 924) and Investigation No. TA-203-11 (USITC Publication 1193)), Bureau of the Census, U.S. Department of Commerce Section 232 Investigation, and the Industrial Fastener Institute (IFI).