

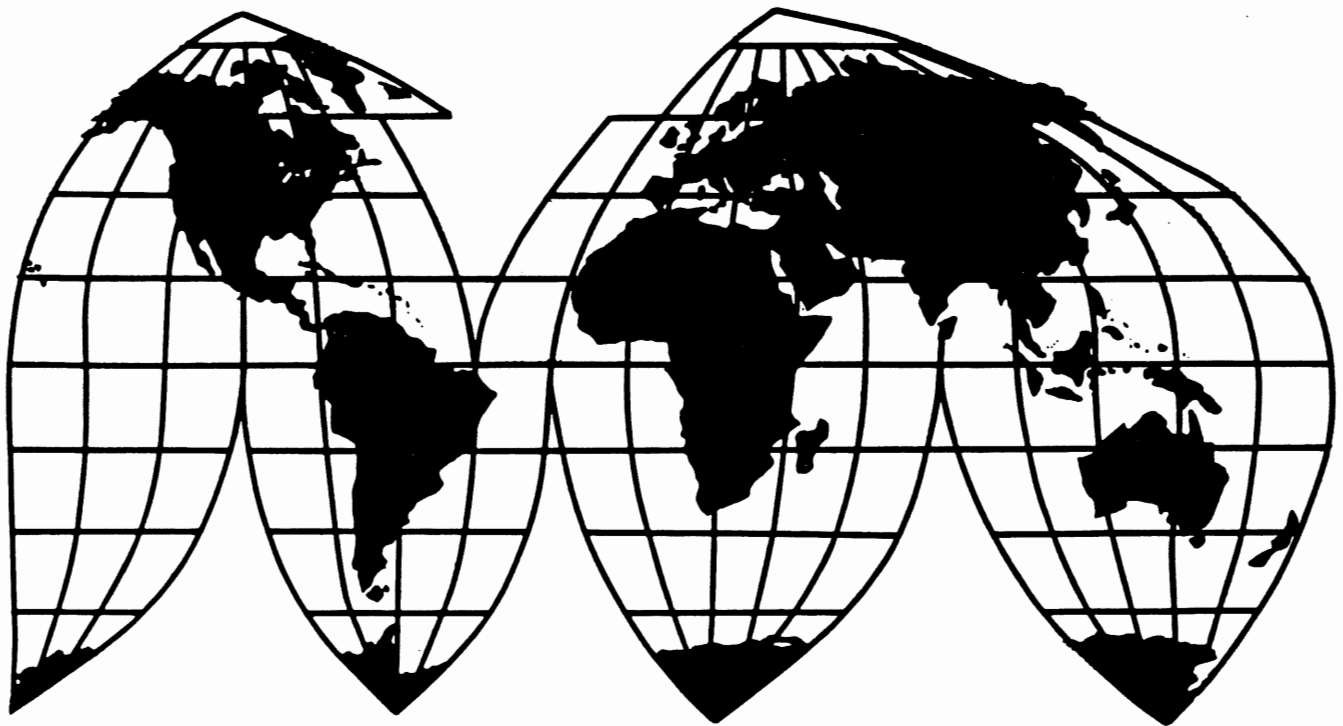
The Economic Effects of Significant U.S. Import Restraints

Investigation No. 332-325

Publication 2699

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U.S. International Trade Commission



Washington, DC 20436

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PREFACE

On June 5, 1992, the United States International Trade Commission instituted investigation No. 332-325, The Economic Effects of Significant U.S. Import Restraints. The investigation, conducted under section 332(g) of the Tariff Act of 1930, is in response to a request from the United States Trade Representative (USTR), see appendix A. The USTR requested that earlier studies on the economic effects of significant U.S. import restraints be periodically updated by the Commission. This study is the first update.

The purpose of this study is to assess the impact of significant U.S. import restraints on U.S. firms, workers, and consumers and on the net economic welfare of the United States. In particular, the USTR requested an assessment of the economywide effects of liberalizing significant U.S. restraints individually as well as collectively.

Public notice of this investigation was given by posting a copy of the notice in the Office of the Secretary, United States International Trade Commission, Washington, DC, and by publishing the notice in the *Federal Register* of June 17, 1992 (57 F.R. 27063-27064), see appendix B. A public hearing in connection with this investigation was held in the Commission hearing room on October 14, 1992, see appendix C.

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EXECUTIVE SUMMARY

This study analyzes the economic effects of significant U.S. import restraints on the U.S. economy and updates previous reports by the United States International Trade Commission (USITC). Following these earlier USITC studies, this report addresses liberalization of significant U.S. import restraints in manufacturing, agriculture, and services.

Economic effects of U.S. import restraints are evaluated with the USITC computable general equilibrium (CGE) model. The base year for the study is 1991. The USITC CGE model allows analysis to extend beyond the sector in question to the economic effects across the U.S. economy. This is possible because the USITC CGE model explicitly accounts for upstream and downstream production linkages, intersectoral competition for labor and capital, and real exchange rate changes.

Two types of import restraints are examined: tariffs and quantitative restrictions such as quotas, voluntary restraint agreements (VRAs), and voluntary export restraints (VERs).¹ For the purposes of this study, tariffs are specified as the average Most Favored Nation (MFN) ad valorem tariff calculated on a dutiable value basis for 1991.² Quotas are introduced into the USITC CGE model by using estimated tariff equivalents.

The technique used in this study to quantify the tariff equivalent associated with a particular quota is the price-gap method. Economic theory suggests that the restrictions imposed by import quotas raise the domestic price above the world price for a commodity. Hence, this gap between the domestic price and the world price (inclusive of transportation costs to deliver the product to the U.S. border) can be used to represent the premium associated with the quota.³ The tariff equivalent is actually the percent above the world price that the price gap represents.

This study follows the earlier USITC studies in defining which import restraints are considered "significant" and provides a quantitative analysis of those restraints. For sectors protected by quantitative restraints, the question becomes whether or not the restrictions are "binding." Binding means that the quantity of imports is actually restricted by the quotas in place. A binding quota is likely to result in a higher price for the restricted product. If the quantity of imports is significantly less than the quantity specified by the quota in place, then the quotas are "nonbinding." When a quota is nonbinding, it is likely that there will be no difference between the world price and the domestic price for the imported product. For nonbinding restrictions, the estimated tariff equivalent is zero and the resulting economic effects of the quota, as estimated by the USITC CGE model, are also zero.

In 1991, several quantitative restrictions were in place. These include the Multifiber Arrangement (MFA); the automobile VER, the machine tool, meat, and steel VRAs; the agricultural

¹ Quotas and other quantitative restrictions, such as VRAs and VERs, have similar effects in the market. Consequently, in this report, the term "quota" is used to represent all types of quantitative restrictions.

² Average ad valorem tariff rates on a dutiable value basis are calculated by dividing the estimated duties collected by the U.S. Treasury for a sector by the value of imports in that sector that are subject to duties. Consequently, the tariff rate used in this report embodies both ad valorem and specific tariff rates specified in the Harmonized Tariff Schedule.

³ For a detailed discussion of tariff equivalents of quotas and the price-gap method, see USITC, *Estimated Tariff Equivalents of U.S. Quotas on Agricultural Imports and Analysis of Competitive Conditions in the U.S. and Foreign Markets for Sugar, Meat, Peanuts, Cotton, and Dairy Products*, publication 2276, Apr. 1990. Also, on the price-gap method, see R. Baldwin, "Measuring Nontariff Trade Policies," NBER working paper #2978, May 1989, and Deardorff and Stern, "Methods of Measurement of Non-tariff Barriers," UNCTAD/ST/MD/28 (Geneva: United Nations Conference on Trade and Development, 1985).

quotas in cotton, dairy, peanuts, and sugar; and the ban on the importation of cabotage maritime services.⁴ Of these sectors, the automobile VER, the steel VRA, and the cotton quotas are considered to be nonbinding in 1991. For all these sectors except cabotage maritime services, tariffs were in place as well as quantitative restrictions.

For sectors protected exclusively by tariffs, a standard is developed to determine a "significant" tariff level. Two considerations were used to determine high MFN tariff sectors at the 4-digit Standard Industrial Classification (SIC) level for analysis: 1) an MFN ad valorem tariff rate of 9 percent or higher, calculated on dutiable value basis and 2) sectors with over \$100 million in dutiable U.S. imports. These considerations result in 12 sectors for study: 1) nonrubber footwear,⁵ 2) watches, clocks, and parts, 3) ball and roller bearings, and parts, 4) pressed and blown glass, n.e.c., 5) costume jewelry and costume novelties, 6) cyclic organic crudes and intermediates, 7) frozen fruits, fruit juices, and vegetables, 8) ceramic wall and floor tile, 9) personal leather goods, 10) electronic capacitors, 11) leather gloves and mittens, and 12) china tableware.

Economic Welfare Effects

For every protected sector analyzed in this study, removal of import restraints results in economic welfare gains. Table ES-1 presents estimates of the welfare gains from the simultaneous liberalization of all import restraints identified in this study, and the welfare gains from individual import restraint removal for each sector analyzed. These estimates can also be interpreted as the annual reduction in national income imposed by these import restraints.

Simultaneous liberalization results in approximately a \$19.0 billion gain for the U.S. economy.⁶ As seen from the individual liberalization estimates, a major portion of this estimated gain comes from liberalization in the textiles and apparel sector. Protection in textiles and apparel cost the U.S. economy an estimated \$15.3 to \$16.4 billion in 1991. Next largest is protection of the maritime sector by the Merchant Marine Act of 1920 (commonly referred to as the Jones Act) where the net welfare gain from liberalization is an estimated \$3.1 billion for 1991. Four of the five agricultural sectors examined (dairy, sugar, peanuts, and meat) are next in terms of cost of protection, with liberalization translating into welfare gains of \$847 million, \$657 million, \$353 million, and \$177 million, respectively. Two high MFN tariff sectors, nonrubber footwear and watches, clocks, and parts, are next, increasing welfare by \$170 million and by \$101 million, respectively. For all other protected sectors, liberalization results in welfare gains of less than \$100 million per sector.

Three sectors are absent from table ES-1: automobiles, steel, and cotton. For these sectors, the significant import restraints were in the form of quantitative restrictions that were determined to be nonbinding; that is, 1991 imports were well below the quantitative restrictions, and as a result, the estimated economic impact for these import restraints is zero.

Employment, Output, and Trade Effects

Table ES-2 provides estimates for the effect on employment, output, imports, and exports from the removal of import restraints in each sector individually analyzed with the USITC CGE model in

⁴ Cabotage is a term used in the maritime transport industry to indicate the carriage of products or people between two ports within a country—such as between Anchorage and Los Angeles in the United States.

⁵ This sector is identified at the 3-digit SIC level because of concordance constraints.

⁶ One sector is omitted from this simulation: the peanut sector. The peanut sector is too small to be identified in the USITC model.

Table ES-1
Economic welfare gains from liberalization, 1991.
(Million dollars)

Sector	Economic Welfare Gain
Simultaneous liberalization of all significant restraints ¹	18,976
Individual liberalization:	
Textiles and apparel ²	15,845
Maritime transport (Jones Act)	3,086
Dairy	847
Sugar	657
Peanuts	353
Meat	177
Nonrubber footwear	170
Watches, clocks, and parts	101
Ball and roller bearings, and parts	45
Pressed and blown glass, n.e.c.	44
Costume jewelry and costume novelties	42
Machine tools	31
Cyclic organic crudes and intermediates	24
Frozen fruit, fruit juices, and vegetables	13
Ceramic wall and floor tile	12
Personal leather goods	7
Electronic capacitors	5
Leather gloves and mittens	2
China tableware	2

¹ This simulation excludes the peanut sector.

² This result is the midpoint of the estimates for liberalizing the textile apparel sector. The estimated results range from \$15,266 million to \$16,424 million.

Source: Estimated by the staff of the USITC.

this study. In manufacturing, these sectors include the textiles and apparel sectors that fall under the MFA, which are analyzed simultaneously, and the machine tools sector. In agriculture, they include sugar, dairy, and meat. In services, the maritime transport sector is liberalized, and finally, the results for the 12 high MFN tariff sectors are presented.

Manufacturing

Textiles and Apparel

The textile and apparel sectors are subject to both relatively high MFN tariffs and quota restrictions. Estimates of economic effects were computed for the removal of the quotas only, and for the removal of both the tariffs and quotas. With regard to quota removal, two scenarios are considered to reflect the flexible nature of the U.S. quota arrangements: one using 80 percent quota utilization and another using 90 percent utilization. The estimates obtained for these scenarios represent an upper and lower bound. The results presented in table ES-2 for this sector represent the effect of tariff and quota liberalization using the upper bound tariff equivalent estimates.

Liberalization of all import restraints in the textile and apparel sectors causes significant increased import penetration. The largest import increase by far, both in dollar and percentage terms, is in the apparel made from purchased materials (apparel) sector, with an increase of over \$7.5 billion in imports, representing a 24.5-percent gain over original levels. Broadwoven fabric mills is next, with a \$491 million (14.2 percent) increase in imports. Four other sectors besides apparel experience import increases over 15 percent.

Apparel and broadwoven fabric mills also lead the other MFA sectors in losses in employment and output. Apparel experiences a decline of nearly \$4 billion (5.9 percent) in output and 46,724 displaced full-time equivalent workers (jobs). Broadwoven fabric mills experience a fall in output of

Table ES-2
Economic effects of liberalization, results of individual simulations, by sector, 1991.

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
<i>Manufacturing</i>								
<i>Textiles:</i>								
Broadwoven fabric mills	-12,346	-5.5	-1,676	5.4	491	14.2	-76	-4.9
Narrow fabric mills	-706	-3.1	-36	-3.0	12	7.2	-6	-2.8
Yarn mills and textile finishing	-3,954	-3.9	-355	-3.8	28	9.9	-6	-3.5
Thread mills	-366	-5.4	-45	-5.4	7	8.1	-7	-4.9
Floor coverings	-246	-0.4	-26	-0.2	54	8.2	-1	(⁴)
Felt and textile goods, n.e.c.	-357	-1.9	-41	-1.8	7	3.3	-5	-1.7
Lace and knit fabric goods	-2,316	-5.4	-328	-5.3	22	10.9	-12	-5.0
Coated fabrics, not rubberized	-231	-2.6	-52	-2.5	25	7.0	-14	-2.3
Tire cord and fabric	-4	-0.1	2	0.1	1	7.1	(³)	0.2
Cordage and twine	-100	-1.4	-6	-1.3	8	5.6	-1	-1.2
Nonwoven fabric	-50	-0.6	-11	-0.4	2	2.3	(³)	-0.3
<i>Apparel and fabricated textile products:</i>								
Women's hosiery, except socks	-94	-0.3	-3	-0.2	13	21.4	(³)	(⁴)
Hosiery, n.e.c.	-645	-1.8	-33	-1.7	55	16.5	-1	-1.3
Apparel made from purchased materials	-46,724	-6.0	-3,976	-5.9	7,554	24.5	-174	-5.5
Curtains and draperies	42	0.2	5	0.2	11	17.4	(³)	1.4
House furnishings, n.e.c.	-434	-0.9	-59	-0.8	160	14.3	1	0.2
Textile bags	-101	-1.1	-6	-1.0	7	11.1	(³)	-0.1
Canvas and related products	-117	-0.7	-7	-0.5	15	12.6	(³)	0.6
Pleating, stitching, trimmings, and schiffli embroidery	-974	-1.4	-74	-1.3	19	20.7	(³)	-0.5
Fabricated textile products, n.e.c.	-1,261	-4.6	-83	-4.4	78	6.2	-29	-3.7
Luggage	-629	-6.2	-72	-6.0	148	10.8	-5	-4.4
Women's handbags and purses	-26	-0.3	-1	-0.1	92	8.5	4	12.3
Machine tools	-625	-1.1	-74	-1.1	60	2.0	-14	-0.8
<i>Agriculture</i>								
<i>Sugar:</i>								
Sugar	-1,876	-8.0	-690	-8.0	769	95.6	-19	-5.6
Sugar-containing products	-164	-0.1	-38	-0.1	138	4.7	6	0.1
<i>Dairy:</i>								
Butter	-357	-13.8	-365	-13.8	(³)	12.0	-5	-13.8
Cheese	-505	-1.9	-260	-1.9	217	57.5	-1	-1.6
Dry/condensed milk products	-886	-5.4	-348	-5.4	20	63.7	-19	-4.7
Cream	-447	-0.5	-136	-0.5	3	38.1	(³)	-0.5
Meat	-928	-0.6	-285	-0.6	340	12.6	-25	-0.6
<i>Services</i>								
<i>Maritime transport:</i>								
Cabotage	-11,905	-100.0	396	4.6	3,594	(⁶)	(⁵)	(⁵)
Water	12,790	8.5	3,983	8.5	12	0.1	1,841	10.6
<i>High MFN tariff sectors</i>								
Nonrubber footwear	-1,377	-1.9	-98	-1.9	446	5.8	11	2.6
Watches, clocks, and parts	217	1.4	9	1.4	91	3.8	5	1.4
Ball and roller bearings, and parts	-168	-1.9	-22	-1.9	92	8.5	3	8.2
Pressed and blown glass, n.e.c.	-249	-0.2	-27	-0.2	35	2.1	-4	-0.2
Costume jewelry and costume novelties	-72	-0.4	-7	-0.4	50	6.1	(³)	-0.2
Cyclic organic crudes and intermediates	-817	-0.3	-264	-0.3	193	1.5	-42	-0.2

See footnotes at end of table.

Table ES-2-Continued
Economic effects of liberalization, results of individual simulations, by sector, 1991.

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
<i>High MFN tariff sectors-Continued</i>								
Frozen fruit, fruit juices, and vegetables	-512	-1.5	-108	-1.4	164	14.8	-8	-1.3
Ceramic wall and floor tile ..	-362	-5.3	-39	-5.3	41	8.3	-1	-5.3
Personal leather goods	-145	-2.4	-21	-2.4	30	8.8	-1	-2.4
Electronic capacitors	-1,011	-0.6	-192	-0.6	172	1.7	-42	-0.5
Leather gloves and mittens .	-49	-3.7	-9	-3.7	15	12.5	(³)	-2.9
China tableware	-397	-8.1	-26	-8.1	31	8.7	-4	-7.9

¹ Full-time equivalent jobs.

² In millions of dollars in base year prices.

³ Change less than 1 million dollars.

⁴ Change less than one-tenth of 1 percent.

⁵ Nontradeable sector.

⁶ Not applicable since base year level is essentially zero.

Source: Estimated by the staff of the USITC.

over \$1.6 billion (5.4 percent) and 12,346 jobs. Overall, only five of the MFA sectors experience output declines of greater than 5 percent.

Despite lost import protection, one of the MFA sectors, curtains and draperies, experiences an output increase. This result occurs because this sector is downstream from the other liberalized MFA textile sectors. Liberalization lowers the price of textile products, which serve as inputs into the curtains and draperies sector. Lower input prices decrease costs and stimulate production for this sector, despite the absence of protection.

Machine Tools

Machine tool VRAs with Japan and Taiwan were in place in 1991, but the quotas were not binding for Japan. Therefore, removal of the Japanese quotas would not have a quantifiable effect. The VRA with Taiwan was binding, but since the import share accounted for by Taiwan is very small (approximately 2 percent), the estimated economic effects are small as well. Liberalization of the machine tools sector leads to a decline in output of \$74 million and a loss of approximately 600 jobs. Both represent declines of slightly over 1 percent. Imports increase 2 percent, or by \$60 million.

Agriculture

Of the five agricultural sectors analyzed in this study, three are presented in table ES-2: sugar, dairy, and meat. The quotas on cotton are found to be nonbinding, and thus, the estimated economic effects using the USITC CGE methodology are zero. Results from the partial equilibrium analysis of liberalization in the peanut sector are not presented in table ES-2, but are discussed at the end of this section.

Lost import protection results in a significant increase in import penetration for the liberalized agricultural sectors. In both dollar and percentage terms, sugar experiences the largest import expansion, with an increase of \$769 million, or 95.6 percent over base year levels. In addition, three of the four dairy sectors experience import expansions over one-third greater than base year levels.

Lost import protection also leads to reduced output and employment. In base year dollar terms, sugar is affected the most, with a \$690 million (8.0 percent) fall in output and a loss of 1,876 jobs. Of the four dairy sectors, butter experiences the largest output loss, with a \$365 million, or 13.8 percent, decline in output. Liberalization in the meat sector has smaller effects on output, employment, and

trade, suggesting that protection in this sector is the least costly of the three agricultural programs analyzed here.

Analysis of the cost of protection in the peanut sector is conducted using a partial equilibrium framework. Liberalization in the peanut sector brings a welfare gain of \$353 million to consumers from lower peanut prices. The producer loss is estimated to be \$337 million.

Services

With the exception of transportation services, significant U.S. import restraints in services do not exist. While foreign providers of some services face constraints on operations in the United States, most of these barriers are, in fact, requirements that foreign service providers adhere to domestic regulatory schemes faced by all providers of the service.

Within transportation services, the air transport sector has significant restraints in the form of restrictive regulations and bilateral agreements that effectively restrain international air transportation services. However, the nature of the industry and the lack of necessary data preclude formal modeling of this service sector.

Maritime transport likewise is subject to significant import restraints by means of restrictive regulations. One of the more important set of restrictions is the Merchant Marine Act of 1920 (Jones Act), which prohibits foreign vessels from carrying domestic freight by water between U.S. ports (cabotage). Despite a number of exemptions, these cabotage restraints are economically significant, with Jones Act trade accounting for a significant share of the cargo transported by U.S.-flag vessels. Unlike air transport, it is possible to estimate a tariff equivalent with the price-gap method for Jones Act trade and conduct analysis using the USITC CGE model.

The effects on employment, output, and trade from removal of the Jones Act are presented in table ES-2. The two sectors primarily affected by liberalization of the Jones Act are cabotage services and other water services. Liberalization causes significant import penetration of over \$3.5 billion in the cabotage sector, with a slight import increase for water transportation. Lost protection results in a shutdown of the oceanborne Jones Act fleet, as represented by the large loss in employment of 11,905 jobs. The output figure for the cabotage sector is positive since it represents composite cabotage services offered, that is, it includes both domestic and imported water transportation services. Hence, composite output rises as domestic employment falls in the Jones Act fleet. Changes in employment reflect oceanborne cabotage services only and the increase in imports are provided by the foreign-flag carriers that enter into U.S. cabotage trade and replace the Jones Act fleet.

In addition, lower prices increase output and employment in the water sector.⁷ Output in the water sector expands by nearly \$4 billion and employment increase by nearly 13,000 jobs. Liberalization of the Jones Act spurs increased activity across the entire water sector, which overwhelm the losses experienced by the oceanborne Jones Act fleet.

High MFN Tariff Sectors

For each of the high MFN tariff sectors, liberalization causes significant import penetration. These results are reported at the bottom of table ES-2. In dollar terms, nonrubber footwear imports increase the most, with a \$446 million gain. Three other sectors see import gains over \$150 million. In percentage terms, the frozen fruits, fruit juices, and vegetables sector and the leather gloves and mittens sector increase the most, with 14.8 and 12.5 percent increases, respectively.

⁷ The water sector includes all other services related to non-Jones Act activity such as international traffic between U.S. and foreign ports, dock and port services incidental to international traffic, dock workers' services, tug boat services, and other water transportation services.

Because of increased import penetration, output and employment fall in all but two of the sectors. In the case of output effects, the largest dollar declines occur in cyclic organic crudes and intermediates (\$264 million) and electronic capacitors (\$192 million). However, these dollar declines are almost negligible in percentage terms for these two sectors. The largest fall in output in percentage terms occurs in the china tableware sector and ceramic wall and floor tile sector, with declines of 8.1 and 5.3 percent, respectively. In the case of employment effects, the labor-intensive nonrubber footwear sector loses the most jobs with approximately 1,400 workers displaced.

One sector, watches, clocks, and parts, actually realizes output and employment gains from lost tariff protection. This result is due to downstream production linkages. A number of products within this sector act as inputs into other products within the sector. Liberalization lowers the price of all products within the sector, including the input goods. Lower input prices means lower costs for downstream products within the sector and result in an increase in output and employment. This effect outweighs the effect of increased import penetration, which tends to lower output and employment.

CHAPTER 1

Introduction

Scope of the Study

This study analyzes the economic effects of significant U.S. import restraints on the U.S. economy and updates previous work by the United States International Trade Commission (USITC). These previous USITC studies addressed in three phases the effects of liberalizing significant U.S. import restraints on a sector-by-sector basis in manufacturing, agriculture, and services, respectively.¹ Because each of these earlier studies provided a detailed history of the import restraints under examination, this study provides only the current operation of the restraint. The base year for this study is 1991, the latest year for which the necessary data are available for the policy simulations.

The current study, as the earlier studies, examines tariffs and quantitative restrictions such as quotas, voluntary restraint agreements (VRAs), and voluntary export restraints (VERs).^{2,3} A tariff generally raises the price of an imported product by a certain percent above its customs value;⁴ a quota raises the price of an imported product by restricting its supply. An important difference between tariffs and quotas is that tariffs produce revenue for the U.S. Treasury, and quotas produce rents that may be captured by importers, exporters, or shared between them. In

¹ These reports are USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase I: Manufacturing*, publication 2222, Washington, DC, Oct. 1989; USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase II: Agricultural Products and Natural Resources*, publication 2314, Washington, DC, Sept. 1990; and USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase III: Services*, publication 2422, Washington, DC, Sept. 1991.

² Quotas and other quantitative restrictions, such as VRAs and VERs, have similar effects in the market. Consequently, in this report, the term "quota" is used to represent all types of quantitative restrictions.

³ This report excludes import restraints resulting from final antidumping or countervailing duty investigations, section 337 or 406 investigations, or section 301 actions. The USITC is currently investigating the economic effects of outstanding antidumping and countervailing duty orders and suspension agreements. This report is scheduled to be finished in June 1995.

⁴ This is called ad valorem tariff. Another form of tariff is a specific tariff, which raises the price of an imported product based on the quantity imported, such as 10 cents per kilogram.

economic terminology, "rent" is the payment to an owner of a factor of production in excess of that factor's value in its best alternative use. In the case of trade quotas, rents are the excess profits accruing to the owners of the quota rights resulting from higher prices induced by the scarcity of the quotas.

This study, following the definition of a "significant" import restraint established by earlier USITC studies, provides a quantitative analysis of the removal of such restraints. Significant quotas are "binding," meaning that the quantity of imports is actually restricted by the quotas in place. If the quantity of imports is significantly less than the quantity specified by the quota in place, then the quotas are "nonbinding" and do not generate excess profits.^{5,6} Consequently, all binding quotas in this study are considered to be significant and nonbinding quotas are not analyzed quantitatively.

During 1991, the following quantitative restraints on certain U.S. imports were in place: the Multifiber Arrangement (MFA); the automobile VER, the machine tool, meat, and steel voluntary restraint agreements VRAs; the agricultural quotas on cotton, dairy, peanuts, and sugar; and the ban on the importation of cabotage maritime services.⁷ Of these sectors, the automobile VER, the steel VRA, and the cotton quotas were found to be nonbinding in 1991. Consequently, empirical estimates for these sectors are not provided. However, a brief qualitative discussion is presented that highlights some of the changes that have occurred in the market with these nonbinding quotas in place.

To narrow the number of sectors for analysis that are protected only by tariffs, a standard was developed to determine a "significant" tariff level. The sectors chosen for individual analysis have two common characteristics: 1) a Most Favored Nation (MFN) average ad valorem tariff rate of 9 percent (calculated

⁵ At which point a quota is considered nonbinding is an empirical question specific to each sector with quotas and this question is considered in subsequent chapters of this report.

⁶ This is not to say that nonbinding quotas necessarily have no effect in the market. See USITC, *The Western U.S. Steel Market: Analysis of Market Conditions and Assessment of the Effects of Voluntary Restraint Agreements on Steel-Producing and Steel-Consuming Industries*, publication 2165, Mar. 1989.

⁷ Cabotage is a term used in the maritime transport industry to indicate the carriage of products or people between two ports within a country—such as between Anchorage and Los Angeles in the United States.

on a dutiable value basis for 1991),⁸ and 2) the tariff covers at least \$100 million in dutiable imports.⁹ The industries selected for this study correspond to 4-digit, Standard Industrial Classification (SIC) industries. These sectors include 1) nonrubber footwear,¹⁰ 2) watches, clocks, and parts, 3) ball and roller bearings, and parts, 4) pressed and blown glass, n.e.c., 5) costume jewelry and costume novelties, 6) cyclic organic crudes and intermediates, 7) frozen fruits, fruit juices, and vegetables, 8) ceramic wall and floor tile, 9) personal leather goods, 10) electronic capacitors, 11) leather gloves and mittens, and 12) china tableware.

This update includes all of the sectors analyzed in the previous USITC studies. However, several of the high MFN tariff sectors in *Phase I* are not included. Luggage and women's handbags and purses are analyzed as part of the MFA since a portion of the imports in these two sectors is covered by the MFA quotas. The remaining sectors from *Phase I* that are not included in this report either had their average tariff rate fall below 9 percent or were too narrow to be included using the approach described in the next section.

Approach of the Study

This study employs a general equilibrium (GE) approach. Previous USITC reports relied almost exclusively on a partial equilibrium (PE) approach.¹¹ PE models generally specify a supply and demand structure for domestic output, for competing imports, and sometimes for domestic output and imports for closely related products in a particular sector. These models typically abstract from any linkages between the sector in question and other sectors in the economy. In addition, they omit macroeconomic considerations. A GE approach includes a balance of trade constraint, handles quota rent transfers, accounts for economywide resource constraints, and explicitly provides for intersectoral linkages to provide a more accurate assessment of employment, output, and trade effects of policy changes.^{12,13}

⁸ Average ad valorem tariff rates on a dutiable value basis are calculated by dividing the estimated duties collected by the U.S. Treasury for a sector by the value of imports in that sector that are subject to duties. Consequently, the tariff rate used in this report embodies both ad valorem and specific tariff rates specified in the Harmonized Tariff Schedule.

⁹ In 1991, the average ad valorem tariff rate for all commodities imported was approximately 5 percent, calculated on a dutiable value basis.

¹⁰ This sector is identified at the 3-digit SIC level because of concordance constraints.

¹¹ Only the second part of *Phase III* used a general equilibrium approach.

¹² In the request letter from the USTR (see app. A), the USITC was asked to examine the removal of individual import restraints in a partial equilibrium framework and examine the simultaneous removal of all import restraints in a general equilibrium framework. After consultations with the USTR outlining the benefits of a GE approach over a PE approach and coupled with the USTR's desire to compare results from simulations of

In the application of a GE model to import restraint removal the following question is asked: What would happen to the economy if the import restraints were removed and all other U.S. policies (fiscal and monetary) as well as foreign conditions (economic behavior in foreign countries) remained the same? The analysis considers what *would have happened* to the U.S. economy in the base year (1991) if the import restraints had been removed. Therefore, the analysis emphasizes the effect of import restraints in isolation from other factors that affect the economy. In addition, the analysis does not incorporate expected future changes in these other factors; therefore, it is not a forecast.

Specifically, GE models simulate interactions among producers and consumers within an economy in markets for goods, services, labor, and physical capital. The distinguishing feature of a GE model is its economywide coverage and multisectoral nature. A GE model explicitly accounts for upstream and downstream production linkages, and intersectoral competition for labor and capital.

Unlike a PE approach, liberalization in a GE model affects not only the protected sectors but all sectors in the economy. One of the ways this occurs is through the effect liberalization can have on macroeconomic variables, such as the real exchange rate and the price of production inputs—labor and capital. These macroeconomic effects are important when discussing the economic effects of liberalization since they can enhance or diminish the direct effects in liberalizing protected sectors.

For example, liberalization affects the U.S. real exchange rate. A common way to construct a real exchange rate is to separately identify a country's goods and services that can be traded with other countries (tradeables) from those that cannot (nontradeables). The relative price between tradeables and nontradeables is the real exchange rate.^{14,15} Liberalization can make the real exchange rate either depreciate or appreciate.

¹²—Continued

individual restraint removal with the results of simultaneous liberalization of all restraints in a consistent framework, the USITC proceeded to analyze significant U.S. import restraints in a GE approach.

¹³ See Jamie de Melo and David Tarr, "Welfare Costs of U.S. Quotas in Textiles, Steel and Autos," *Review of Economics and Statistics*, vol. 72 (Aug. 1990), 489-97.

¹⁴ This should not be confused with the "nominal" exchange rate, which refers to relative currency valuations among countries, or other definitions of the real exchange rate, such as purchasing power parity exchange rates. See Edwards, "Economic Liberalization and the Equilibrium Real Exchange Rate in Developing Countries," NBER working paper 2179, Mar. 1987, for a discussion of the various definitions of real exchange rates used in economic research.

¹⁵ The exchange rate in the USITC model is constructed to behave like the real exchange rate defined here.

If the real exchange rate depreciates from liberalizing protection, then the price of tradeable goods has risen relative to nontradeable goods. The relatively higher price of all tradeable goods and services in the economy raises *both* import and export prices. Thus, there is an overall tendency for consumers to import less and producers to export more. It should be noted that for the specific sectors that are liberalized, this economywide exchange rate effect is overshadowed by the increased import penetration due to lost protection. Consequently, the real exchange rate effect is more useful in explaining why sectors in the rest of the economy, which are not directly affected by liberalization, experience trade effects. A depreciation of the real exchange rate can also explain why it is possible for exports to rise in a liberalized sector, even when overall domestic output in the sector declines.

Another economywide effect captured by GE models is the impact of liberalization on the primary inputs in production—labor and capital. Because the prices for labor and capital can be allowed to change in GE models, these changes can affect the overall results of the model.¹⁶ When the wage-rental ratio increases, the price of labor has risen relative to the price of capital, and consequently, producers use more capital and less labor to reduce costs. If liberalization raises the economywide wage-rental ratio, it is possible to see some sectors use less workers, despite producing more output.

USITC Model

In order to quantify the effects of trade policy questions, the USITC constructed its own GE model.^{17,18} Such models are generally referred to as applied or computable general equilibrium models (CGE). The purpose of the USITC CGE model was to develop a consistent, analytical framework and data base for simulating the economywide effects of U.S. trade policy. The USITC model is a static model that assesses the impact of trade policy change at one point in time. Consequently, the model does not capture dynamic effects that may result from trade liberalization such as an increase in the rate of economic growth in the U.S. economy.¹⁹

¹⁶ The price of labor is the wage, whereas the price of capital is called the “rental price of capital.” The ratio of these two prices is called the “wage-rental ratio.”

¹⁷ For a more technical discussion of the USITC model, see appendix D.

¹⁸ Chairman Newquist notes that the economic modeling used to measure the effects of the removal of U.S. import restraints relies on a number of assumptions and variables, and by its nature will differ according to the information sought and the judgement of the economist performing the modeling exercise. The Chairman notes that economic modeling is only one of several means the Commission staff uses in providing economic assessments for the Commission’s consideration in adopting its final reports.

¹⁹ See USITC, “*The Dynamic Effects of Trade Liberalization: A Survey*,” publication 2608, Feb. 1993. This report surveys the recent economic literature on the dynamic implications of trade liberalization: that is, what

USITC Model Data

The data used by the USITC CGE model are in the form of a large “social accounting matrix” (SAM). The SAM organizes data on interindustry flows, value added, imports, and final demand for 487 production sectors in a consistent framework.²⁰ The SAM was assembled from a variety of government data sources and updated to 1991.²¹ The other major inputs into the USITC model are the parameters that represent the behavior of economic agents in the U.S. economy. These parameters are in the form of elasticities and are either estimated by the staff of the USITC or gathered from published sources.²²

In order to perform trade policy simulations, one needs estimates of U.S. import restraints. Tariffs are readily quantifiable. The SAM contains import data and the estimated duties collected by the U.S. Treasury from official statistics of the U.S. Department of Commerce. As part of the modeling exercise, average tariffs are calculated for each sector specified for the policy simulation. To estimate the economic effects of liberalizing a sector, the tariff is set equal to zero.

Although the effects of quotas in the market are difficult to quantify in an empirical model, one can estimate a tariff that has the same effect on prices and quantities as a quota. This is generally referred to as the tariff equivalent of a quota. The technique used in this study to quantify the premium associated with a particular quota is the price-gap method. Economic theory suggests that the restrictions imposed by import quotas raise the domestic price above the world price for a commodity. Hence, this gap between the domestic price and the world price (inclusive of transportation costs to deliver the product to the U.S. border) can be used to represent the premium associated with the quota.²³ The tariff equivalent is actually the percent differential above the world price

¹⁹—Continued

determines economic growth and how does trade policy affect the factors that determine economic growth.

²⁰ In the modeling exercise, sectors of interest are isolated and the remaining sectors are aggregated into nine broad sectors that represent the remainder of the U.S. economy (see appendix D).

²¹ For a more technical discussion of the USITC SAM and how it was constructed, see Reinert and Roland-Holst, “A Detailed Social Accounting Matrix for the USA, 1988,” *Economic Systems Research*, vol. 4 (1992), 173-87.

²² These parameters are described in more detail in Reinert and Roland-Holst, “Parameter estimates for U.S. Trade Policy,” unpublished working paper, 1991.

²³ For a detailed discussion of tariff equivalents of quotas and on the price-gap method, see USITC, *Estimated Tariff Equivalents of U.S. Quotas on Agricultural Imports and Analysis of Competitive Conditions in U.S. and Foreign Markets for Sugar, Meat, Peanuts, Cotton, and Dairy Products*, publication 2276, Apr. 1990. Also, on the price-gap method, see R. Baldwin, “Measuring Nontariff Trade Policies,” NBER working paper 2978, May 1989, and Deardorff and Stern, “Methods of Measurement of Non-tariff Barriers,” UNCTAD/ST/MD/28 (Geneva: United Nations Conference on Trade and Development, 1985).

that the price gap represents. For example, if the domestic price is \$15 and the price of an import at the border is \$10, then the tariff equivalent of the quota would be 50 percent. For all of the sectors with binding quotas, a tariff equivalent is estimated and used in the USITC model to simulate the effects of removing the quota.

In addition, all the sectors with quotas examined in this report have tariffs in place. Generally, these tariffs are small and have a much smaller impact on the market than the quotas. When a sector is liberalized, its tariff is also set to zero to examine the sector under free trade. The one exception to this approach is the analysis of the MFA. In this sector, many of the tariffs are quite high, and consequently, two liberalization scenarios are simulated: one regime where the quotas are lifted but the tariffs remain in place, and another regime where both the tariffs and quotas are liberalized.

USITC Model Results

The results of the USITC CGE model can be divided into two broad categories: overall macroeconomic results and sector specific results. One of the primary macroeconomic results is the economywide net economic welfare effect produced by a change in U.S. trade policy. Welfare is measured in the USITC model using the concept of equivalent variation.²⁴ The model specifies that firms pay income to households, so that changes in the income of firms from liberalization translate into corresponding changes in the income of households. For this reason, the equivalent variation measure is appropriate to assess the *economywide* net welfare change: it measures not only the income gain consumers experience from lower prices due to liberalization, but also the net gain or loss to all firms in the economy from removal of import restraints. Other macroeconomic results reported include the percent change in wages, the wage-rental ratio, and the real exchange rate.

The USITC CGE model also provides results for the individual sectors highlighted in a particular policy simulation. The results are in absolute terms (in millions of dollars in base year prices) and in percent change from base period levels. Specifically, the model reports changes in employment, output, imports, and exports for the liberalized sector(s) as well as for the industrial sector(s) that are upstream suppliers

²⁴ The equivalent variation measure asks what income change at base year prices would need to be given to or taken away from households so that they would remain equally well off under the alternative policy scenario.

and downstream consumers to the liberalized sector(s). One note about the results presented in this study concerns the nine broad sectors that represent an aggregation of the remaining sectors in the U.S. economy. These sectors tend to be large in size relative to the highlighted sector(s). Therefore, even though these broad sectors experience larger absolute changes from liberalization, in percentage terms the effects are generally negligible, that is, a change of less than one-tenth of 1 percent.

Organization of the Study

Chapter 2 presents the results of *simultaneously* liberalizing all significant import restraints analyzed individually in subsequent chapters. In this exercise, the only upstream and downstream linkages discussed are those among the liberalized sectors themselves. This exercise highlights the importance of macroeconomic considerations of an economywide policy simulation.

Chapter 3 presents the results of liberalizing the significant quantitative restrictions in the manufacturing sector. They include the Multifiber Arrangement and the machine tool VRA. The automobile VER and steel VRA are not analyzed quantitatively, but a brief review of their current status is provided in this chapter.

Chapter 4 presents the results of liberalizing the significant quantitative restrictions in the agricultural sector. They include the dairy, peanut, and sugar quotas and the VRA in the meat sector. The cotton sector is not analyzed quantitatively, but a brief review of its current status is provided in this chapter.

Chapter 5 presents the results of liberalizing the significant quantitative restrictions in the services sector. The only quantifiable restraint analyzed in this chapter is the restrictions placed on maritime transport services. Also, this chapter provides a brief discussion of other service sectors as well.

Finally, chapter 6 presents the results of individually liberalizing sectors protected only with significant MFN tariffs. Twelve sectors have been identified, and each is discussed in turn starting from the sector with the largest welfare impact to the sector with the smallest.

CHAPTER 2

Liberalizing All Significant U.S. Import Restraints

This chapter examines the economic effects produced by the *simultaneous* removal of all significant U.S. import restraints from all sectors discussed in this study.²⁵ Examining the economic effects of simultaneously liberalizing all sectors provides an estimate of the *overall* cost of protection in the United States. Because the USITC CGE model's explicit accounting for linkages among sectors allows effects in one liberalized sector to affect other liberalized sectors, the results reported in this chapter may be somewhat different from the sum of the *individual* liberalization results that are analyzed in the rest of the report.

Significant Import Restraints

Based on the selection criteria described in chapter 1, this study identifies 44 sectors with significant import restraints. Table 1 lists the 43 sectors used in this simulation, their tariff rates, tariff equivalent quota premiums, and associated quota rents. The first 22 sectors represent the products covered under the Multifiber Arrangement (MFA). They are divided into two categories: 1) textiles, and 2) apparel and fabricated textile products. The machine tool sector is listed next, which is the only manufacturing sector to have a binding quota besides the sectors under the MFA. The next 7 protected sectors are the specific agricultural sectors that have binding quotas and are large enough to be analyzed by the USITC CGE model. This is followed by the restrictions on maritime cabotage services that comprise part of the maritime transport sector.²⁶ These restrictions are imposed by the Merchant Marine Act of 1920, more

²⁵ One sector is omitted from this simulation: the peanut sector. The peanut sector is too small to be identified in the USITC model.

²⁶ The water transportation sector is treated differently in this chapter than in the subsequent Services chapter. Given the complex nature of this simulation, the water transportation sector in this chapter includes both cabotage and non-cabotage services, such as dock and port services incidental to maritime traffic, dock workers' services, tug boat services, and other water transportation services. In the Services chapter, cabotage services are separated out of the water transportation sector.

commonly referred to as the Jones Act. The last 12 sectors are the ones found to have the highest Most Favored Nation (MFN) tariffs, but are subject to no quota restrictions.

As table 1 shows, with the exception of the maritime transport sector, all sectors are subject to some positive ad valorem tariff. In addition, 31 of the 43 sectors are subject to quota restrictions. These quota restrictions are introduced into the model through tariff equivalent premiums of the import quotas using the price-gap method as described in chapter 1. For more information on estimation of an individual sector's tariff equivalent quota premium, see subsequent chapters in this report.²⁷

The third column of table 1 reports the rents generated by the quotas, as estimated by the USITC CGE model. The sector with the largest rents is the apparel made from purchased materials sector, with rents totaling nearly \$4 billion. Rents associated with the sugar quota are next, totaling nearly \$450 million. Quota rents from broadwoven fabric mills and sugar-containing products are approximately \$250 million each.

Removal of All Significant U.S. Import Restraints

Simultaneous liberalization of significant U.S. import restraints results in a net economic welfare gain of approximately \$19.0 billion.²⁸ This increase in welfare is almost four-tenths of 1 percent of base year 1991 gross domestic product. As noted in chapter 1, income changes for firms translate into income changes for households, and consequently, the welfare gain of \$19 billion is *net* of the losses incurred by the firms in sectors that lose import protection. These losses are outweighed by the gains from lower prices

²⁷ The MFA analysis in the next chapter reports two sets of results based on two different sets of estimated tariff equivalent quota premiums: an upper bound and a lower bound. The estimated tariff equivalent quota premiums used here for the MFA sector are the ones corresponding to the upper bound.

²⁸ Simultaneous liberalization of *all* import restraints in the U.S. economy, including the ones not identified as significant in this report (namely, sectors with an ad valorem tariff of less than 9 percent, on a dutiable value basis, and no quantitative restrictions), results in a larger welfare gain of approximately \$20.7 billion.

Table 1
Significant U.S. Import restraints, by sector, 1991

Sector	Average MFN Tariff Rate ¹	Quota Premium ²	Quota Rents ³
	Percent		
Textiles:			
Broadwoven fabric mills	12.5	8.5	241
Narrow fabric mills	7.4	3.4	5
Yarn mills and textile finishing	8.9	5.1	12
Thread mills	10.1	4.6	3
Floor coverings	5.9	2.8	17
Felt and textile goods, n.e.c.	4.8	1.0	2
Lace and knit fabric goods	13.2	3.8	7
Coated fabrics, not rubberized	9.5	2.0	6
Tire cord and fabric	5.6	2.3	(⁴)
Cordage and twine	4.5	3.1	4
Nonwoven fabric	3.5	0.1	(⁴)
Apparel and fabricated textile products:			
Women's hosiery, except socks	15.7	5.4	3
Hosiery, n.e.c.	15.9	3.5	10
Apparel made from purchased materials	16.9	16.8	3,794
Curtains and draperies	12.1	5.9	3
House furnishings, n.e.c.	7.7	8.3	80
Textile bags	7.1	5.9	3
Canvas and related products	8.0	6.3	7
Pleating, stitching, trimmings, and schiffli embroidery	9.5	5.2	4
Fabricated textile products, n.e.c.	4.1	9.2	101
Luggage	15.7	2.6	30
Women's handbags and purses	13.3	1.0	9
Machine tools	4.3	0.2	6
Agricultural sectors:			
Sugar	0.7	124.8	446
Sugar-containing products	6.2	10.0	261
Butter	5.1	26.9	(⁴)
Cheese	10.4	35.4	65
Dry/condensed milk products	5.6	60.3	11
Cream	3.7	60.3	3
Meat	1.9	6.5	163
Maritime transport (Jones Act)	(⁵)	133.0	(⁵)
High MFN tariff sectors:			
Nonrubber footwear	10.7	(⁵)	(⁵)
Watches, clocks, and parts	9.0	(⁵)	(⁵)
Ball and roller bearings	9.0	(⁵)	(⁵)
Pressed and blown glass, n.e.c.	11.0	(⁵)	(⁵)
Costume jewelry and novelties	9.7	(⁵)	(⁵)
Cyclic organic crudes and intermediates	13.1	(⁵)	(⁵)
Frozen fruit, fruit juices, and vegetables	24.4	(⁵)	(⁵)
Ceramic wall and floor tile	19.1	(⁵)	(⁵)
Personal leather goods	11.4	(⁵)	(⁵)
Electronic capacitors	9.8	(⁵)	(⁵)
Leather gloves and mittens	14.0	(⁵)	(⁵)
China tableware	13.8	(⁵)	(⁵)

¹ Ad valorem tariff rate, dutiable value basis, except for the MFA sectors, which are concorded specifically for the USITC CGE model.

² Tariff equivalent quota premium rate.

³ In millions of dollars.

⁴ Less than \$1 million dollars.

⁵ Not applicable.

Sources: Ad valorem tariff equivalents compiled from official statistics of the U.S. Department of Commerce. Tariff equivalents of the quotas are estimated by USITC staff. Quota rents are calculated by USITC staff using the USITC CGE model.

faced by consumers and downstream suppliers, the elimination of deadweight losses associated with protection, and the transfer of the quota rents captured by foreign firms back to the U.S. economy.

A primary reason for the large gain in economic welfare is the decline in prices in the previously protected sectors. For example, some of the larger price declines include: apparel from purchased materials (apparel), 11.4 percent; sugar, 8.3 percent; and luggage, 9.1 percent. Across the U.S. economy, liberalization of all significant import restraints brings a slight increase in output by 0.24 percent (\$12.5 billion) while at the same time results in a negligible decline in employment by 0.008 percent. In addition, overall imports and exports increase by \$10.3 billion and \$3.5 billion, respectively.

Other economywide results from liberalization include a higher wage-rental ratio (0.54 percent), which indicates that labor has become more expensive relative to capital. Removal of the import restraints also causes a slight depreciation of the real exchange rate by approximately one-half of 1 percent. This tends to lower import demand and to raise export competitiveness of the U.S. economy. However, for the previously protected sectors this macroeconomic result is offset by the decrease in import prices, which tends to increase import demand. These overall macroeconomic changes affect the liberalization results and will guide various aspects of the discussion below.

Table 2 presents the economic effects on employment, output, imports, and exports of simultaneously liberalizing all significant U.S. import restraints. In general, the results show that the previously protected sectors suffer from lost protection and the sectors comprising the rest of the U.S. economy gain. The notable exception is the maritime transport sector, which benefits, despite the removal of the Jones Act restrictions. The following discussion first focuses on the maritime transport results, then highlights the economic effects in the other liberalized sectors, and concludes with an analysis of the economic impact on the aggregate sectors that represent the rest of the U.S. economy.

Maritime Transport

The maritime transport sector experiences gains in imports, exports, output, and employment. These results are attributable to the fact that 1) cabotage services protected by the Jones Act are only part of the maritime transport sector and 2) liberalization of all significant import restraints in the U.S. economy increases the overall volume of trade for *all* goods and services, and hence, the demand for maritime services. The increased demand for maritime services more than compensates for the lost protection in the cabotage part of this sector, and net output, employment, and exports in this sector increase by \$1.3 billion, 5,000 full-time equivalent workers, and \$1.0 billion, respectively. Imports increase by \$517 million because of the increased volume of trade and the elimination of the Jones Act restrictions.

Other Liberalized Sectors

The primary effect of removing the tariffs and quotas on the other liberalized sectors is a reduction in the prices of imported goods. This leads to increased consumption of imports by households in each liberalized sector. In percentage terms, the largest increase in import penetration occurs in the agricultural sectors. Imports of sugar, dry/condensed milk products, and cheese increase by more than 50 percent over base year levels. In the MFA sectors, apparel and women's hosiery experience the largest percentage gain in imports, with 24.6 and 21.3 percent increases, respectively. In base year dollars, the largest import gain is in the apparel sector, with an increase of over \$7.5 billion, followed by sugar (\$766 million), broadwoven fabric mills (\$492 million), and nonrubber footwear (\$331 million).

In general, the export effects are small for the other liberalized sectors. Many sectors experience a decline in exports as they decrease domestic output due to increased import competition that lost protection brings. A few sectors increase exports, despite the loss of import protection. This can be explained by the depreciated real exchange rate, which has increased the price of exports relative to nontraded goods across the economy, and thus, gives producers more incentive to export. One example of this is in the women's handbags and purses sector, which sees exports rise by 12.3 percent.

Domestic production in almost all the protected sectors falls because of increased import competition. In percentage terms, the largest declines occur in sugar (7.9 percent), china tableware (7.7 percent), luggage (6.0 percent), and apparel (5.9 percent). In base dollar terms, apparel suffers the largest absolute decline, with almost a \$4.0 billion drop in output followed by broadwoven fabric mills with over a \$1.6 billion loss.

Besides the maritime transport sector, seven of the other liberalized sectors actually experience gains in output, despite loss of import protection. They are 1) tire cord and fabric, 2) curtains and draperies, 3) butter, 4) cream, 5) sugar-containing products, 6) costume jewelry and costume novelties, and 7) watches, clocks, and parts. The results suggest that these sectors, despite their own lost tariff protection, may be gaining in some way from liberalization occurring in other sectors or from changes in macroeconomic variables caused by liberalization.

Of the eight sectors that experience output gains, three do so because they are downstream from other liberalized sectors and benefit from lower input prices. For example, sugar-containing products use sugar as a production input. When sugar loses its import protection, the price of sugar falls. The lower sugar price can then stimulate domestic production of sugar-containing products. If the incentive to produce more because of lower input prices is larger than the incentive to produce less because of lost protection, then domestic production increases. This explanation also applies to the output gains in the tire cord and

Table 2
Economic effects of simultaneous liberalization, by sector, 1991

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
Liberalized sectors:								
Textiles:								
Broadwoven fabric mills	-12,288	-5.5	-1,667	-5.4	492	14.2	-76	-4.8
Narrow fabric mills	-699	-3.0	-35	-2.9	11	7.0	-6	-2.7
Yarn mills and textile finishing .	-3,839	-3.8	-344	-3.7	29	10.2	-6	-3.3
Thread mills	-365	-5.4	-45	-5.4	7	7.8	-7	-4.9
Floor coverings	-229	-0.4	-22	-0.2	54	8.1	(³)	0.1
Felt and textile goods, n.e.c.	-342	-1.8	-39	-1.7	7	3.2	-5	-1.6
Lace and knit fabric goods . .	-2,308	-5.4	-327	-5.3	22	10.9	-12	-5.0
Coated fabrics, not rubberized	-228	-2.6	-51	-2.5	25	6.9	-14	-2.3
Tire cord and fabric	-5	-0.1	1	0.1	1	6.6	(³)	0.2
Cordage and twine	-83	-1.2	-5	-1.0	8	5.8	(³)	-0.9
Nonwoven fabric	-48	-0.5	-10	-0.4	2	2.2	(³)	-0.3
Apparel and fabricated textile products:								
Women's hosiery, except socks	-85	-0.3	-2	-0.1	13	21.3	(³)	(⁴)
Hosiery, n.e.c.	-631	-1.7	-32	-1.7	55	16.4	-1	-1.3
Apparel made from purchased materials	-46,616	-6.0	-3,965	-5.9	7,571	24.6	-173	-5.5
Curtains and draperies	45	0.2	5	0.3	11	17.5	(³)	1.4
House furnishings, n.e.c. . . .	-423	-0.9	-57	-0.8	160	14.3	1	0.2
Textile bags	-91	-1.0	-5	-0.9	6	10.0	(³)	0.3
Canvas and related products	-106	-0.6	-6	-0.5	15	12.3	(³)	0.7
Pleating, stitching, trimmings and schiffli embroidery . . .	-889	-1.3	-66	-1.1	11	12.5	(³)	-0.4
Fabricated textile products . .	-1,261	-4.6	-83	-4.4	78	6.2	-29	-3.7
Luggage	-629	-6.1	-72	-6.0	149	10.8	-5	-4.5
Women's handbags and purses	-26	-0.3	-1	-0.1	92	8.5	4	12.3
Machine tools	-575	-0.9	-55	-0.8	51	1.7	-8	-0.5
Agricultural sectors:								
Sugar	-1,865	-8.0	-674	-7.9	766	95.2	-18	-5.1
Sugar-containing products . .	-249	-0.1	67	0.1	132	4.5	25	0.7
Butter	1	(⁴)	4	0.2	1	32.6	(³)	0.5
Cheese	-321	-1.2	-143	-1.0	218	57.6	(³)	-0.7
Dry/condensed milk products	-43	-0.3	-2	(⁴)	22	72.3	1	0.2
Cream	-36	(⁴)	55	0.2	3	38.7	(³)	0.6
Meat	-523	-0.3	-134	-0.3	329	12.2	-1	(⁴)
Maritime transport (Jones Act) .	5,003	2.7	1,279	2.8	517	3.0	1,035	6.0
High MFN tariff sectors:								
Nonrubber footwear	-806	-1.1	-51	-0.9	331	4.2	11	2.5
Watches, clocks, and parts . .	257	1.7	11	1.8	97	4.1	6	1.8
Ball and roller bearings and parts	-348	-1.1	-46	-1.0	50	5.0	-7	-0.9
Pressed and blown glass, n.e.c.	-127	-0.1	-4	(⁴)	36	2.2	(³)	(⁴)
Costume jewelry and costume novelties	-6	(⁴)	2	0.1	51	6.2	1	0.4
Cyclic organic crudes and intermediates	-1,120	-0.4	-130	-0.1	183	1.4	-4	(⁴)
Frozen fruit, fruit juices, and vegetables	-387	-1.1	-73	-1.0	144	13.0	-4	-0.6
Ceramic wall and floor tile . .	-356	-5.2	-38	-5.1	41	8.2	-1	-4.7
Personal leather goods	-130	-2.2	-17	-2.0	29	8.6	(³)	-0.7
Electronic capacitors	-542	-0.3	-80	-0.2	161	1.6	-15	-0.2
Leather gloves and mittens . .	-41	-3.1	-7	-3.0	15	12.3	(³)	-2.0
China tableware	-385	-7.8	-26	-7.7	30	8.7	-4	-7.5

See footnotes at end of table.

Table 2—Continued
Economic effects of simultaneous liberalization, by sector, 1991

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
Rest of the U.S. economy:								
Agriculture, forestry, and fisheries	-1,070	-0.1	357	0.2	-31	-0.3	387	1.5
Mining	-723	-0.1	288	0.2	28	0.1	47	0.6
Construction	-208	(⁴)	388	0.1	(⁵)	(⁵)	(⁵)	(⁵)
Nondurable manufacturing ..	-1,232	(⁴)	1,643	0.2	-150	-0.2	316	0.4
Durable manufacturing	22,663	0.2	4,418	0.3	-162	-0.1	1,243	0.5
Transportation, communications, and utilities	4,762	0.1	1,720	0.2	-63	-0.1	339	0.6
Wholesale and retail trade ..	5,886	(⁴)	1,712	0.2	(⁵)	(⁵)	(⁵)	(⁵)
Finance, insurance, and real estate	-1,446	(⁴)	4,060	0.3	-6	-0.1	111	0.7
Other services	36,185	0.1	4,753	0.2	-32	-0.1	371	0.4

¹ Full-time equivalent jobs.

² In millions of dollars in base year prices.

³ Change less than 1 million dollars.

⁴ Change less than one-tenth of 1 percent.

⁵ Nontradeable sector.

Source: Estimated by the staff of the USITC.

fabric sector and the curtains and draperies sector, both of which are downstream from other liberalized textile sectors.

A slightly different example of this lower input price effect is manifested by the output gain experienced in the watches, clocks, and parts sector. Some segments of this sector (watch and clock parts) are inputs into other segments of the sector (finished watches and clocks). Therefore, when the sector is liberalized, the finished goods segment of the sector experiences lower input prices, which tend to make it produce more. The positive effect of lower input prices can be larger than the negative effect on output that increased imports can cause. When this occurs, the entire sector experiences a net output gain. This explanation is also applicable to the costume jewelry and costume novelties sector, which has some segments that are downstream from other segments.

For the remaining two sectors experiencing output gains (butter and cream), the results are due more to the macroeconomic effects occurring in the economy than from overall liberalization. For both sectors import penetration is small in base dollar terms. Butter and cream imports increase by only \$1 million and \$3 million, respectively. Thus, the lost protection tends to lower prices and output by a small amount. But at the same time, two effects tend to raise prices and production for all products in the economy: higher consumer demand from the \$19.0 billion increase in household income from liberalization, and the depreciation of the real exchange rate, which makes exporting more attractive. These effects offset lost protection, and prices (both domestic and export) rise

slightly in these two sectors, causing output to rise as well.

Finally, the sectors that experience output declines also experience accompanying employment declines. Apparel and broadwoven fabric mills suffer the largest number of displaced workers with a loss of approximately 46,500 and 12,000 full-time equivalent jobs, respectively. Of the seven previously protected sectors that experience output gains, four (cream, sugar-containing products, costume jewelry and costume novelties, and tire cord and fabric) experience employment loss, despite small output gains. This is due to the higher economywide wage-rental ratio (a result of liberalization), which raises the wage relative to the price of capital in the economy and causes employers to substitute capital for labor, reducing employment.

Rest of the U.S. Economy

In the aggregate sectors that comprise the rest of the U.S. economy, trade effects are explained primarily through the depreciation of the real exchange rate since these aggregate sectors are not directly affected by removal of import restraints. Depreciation of the real exchange rate raises both import and export prices slightly across the economy. This tends to decrease imports and increase the incentive for domestic producers to export. The economywide trend to import less is demonstrated by the import declines in the aggregate sectors of the economy (except for mining). Similarly, exports rise in the aggregate sectors with agriculture, forestry, and fisheries posting the largest percentage gain (1.5 percent) and durable

manufacturing experiencing the largest gain in base year dollars (over \$1.2 billion).

In contrast to the previously protected sectors, the aggregate sectors that comprise the rest of the U.S. economy experience output gains due to lower input prices. Six of the nine experience an increase in output of \$1.6 billion or more over base year levels. Since these sectors gain from the elimination of significant import restraints, it demonstrates that there are costs to

these competitive sectors of the U.S. economy when import protection is in place.

Four of the nine aggregate sectors experience employment gains, with other services and durable manufacturing adding approximately 34,000 and 27,500 full-time equivalent jobs, respectively. Five of these sectors experience a displacement of workers, despite output gains. This is attributable to the substitution of capital for labor taking place in response to the rise in the wage-rental ratio.

CHAPTER 3

Manufacturing

Textiles and Apparel

International trade in textiles and apparel is governed largely by the Arrangement Regarding International Trade in Textiles, more generally known as the Multifiber Arrangement (MFA). In 1991, U.S. imports from around 40 countries were subject to the imposition of quotas under the MFA.²⁹ During that year, total imports from these countries accounted for approximately 73 percent of total U.S. imports of textiles and apparel. In many cases, particularly with the United States' major trading partners, the quotas were binding.

In 1991, the trade-weighted, average ad valorem tariff rates for U.S. imports of textiles and apparel were 12.6 percent and 16.8 percent, respectively.³⁰ Textile and apparel imports qualify for preferential tariff treatment under free-trade agreements negotiated with Israel and Canada. In addition, a number of countries benefit from reduced duties under heading 9802.00.80 of the Harmonized Tariff Schedule of the United States.³¹ Countries included in the Caribbean Basin Initiative (CBI) and Mexico also benefit from preferential quota access for imports entering the United States under this heading.

In 1991, total U.S. imports of textiles and apparel amounted to \$42.1 billion, resulting in an import/production ratio of 0.32. U.S. exports totaled \$9.0 billion, accounting for only 7.0 percent of U.S. production in 1991 (see table 3).

²⁹ Bilateral quotas negotiated under the MFA are product specific. The number of product categories and the extent to which specific quotas are binding vary by country.

³⁰ Ad valorem tariffs that apply to imports of textiles and apparel from countries without MFN status range from free (for a limited number of items) to over 100 percent. These tariffs reflect the rates applied to all imports of textiles and apparel as a result of the Tariff Act of 1930. Ad valorem tariffs that apply to countries with MFN status have declined over the past 40 years through successive multilateral trade negotiations. Nonetheless, the MFN tariffs on textiles and apparel remain higher than those applied to most other manufactured products.

³¹ Nonetheless, reduced duty treatment afforded by heading 9802.00.80 has resulted in only a slight difference in the nominal and effective rates of duty applied to these products.

Current Operation of the Multifiber Arrangement

Although quantitative restraints on U.S. imports of textiles and apparel have been in effect since the 1950s, the scope of these restraints has increased significantly during the past two decades. The MFA was the result of multilateral negotiations in 1973 that involved approximately 50 countries. Initially, the MFA covered trade in products made of cotton, wool, and manmade fibers. In 1986 the MFA coverage was broadened to include products made of silk blends and noncotton vegetable fibers. The MFA is set to expire on December 31, 1993.³²

The expiration of the agreement is intended to coincide with the expected implementation of an agreement on textiles and apparel negotiated in the ongoing Uruguay Round General Agreement on Tariffs and Trade (GATT) negotiations. The GATT released a draft agreement in December 1992 that would phase out the MFA over a 10-year period and bring international trade in textiles and apparel products under normal GATT rules.

The MFA represents a departure from normal GATT rules because it allows for country-specific restraints in contradiction to the principle of equal treatment for all GATT member countries. Under the MFA, signatories can negotiate bilateral agreements that establish quotas on imports of most types of textiles and apparel. In the absence of a bilateral agreement, a country may impose unilateral quotas for up to 2 years. Although quotas generally have been increased annually by 1 percent for wool products and 6 percent for all other covered products, major suppliers are frequently subject to lower growth limits.

Under the MFA, industrialized countries that are signatories to the arrangement have established quotas on imports of textile and apparel products from developing and newly industrialized countries, but generally have not used quotas to restrict trade from other industrialized countries. Table 4 shows the

³² For a review of U.S. trade policy regarding textiles and apparel, see USITC, *The Year In Trade: Operation of the Trade Agreements Program*, various years. See also, Donald B. Keesing and Martin Wolf, *Textile Quotas against Developing Countries* (London: Trade Policy Research Centre, 1980), for a review of agreements affecting textiles and apparel prior to the 1980s.

Table 3
Textile and apparel: Summary data, 1991

USITC sector	Employment	Shipments	Imports	Exports
	1,000 workers		Million dollars	
Textiles:				
Broadwoven fabric mills	233.1	20,312.4	3,454	1,568
Narrow fabric mills	23.9	1,192.7	159	229
Yarn mills and textile finishing	104.5	11,459.1	280	180
Thread mills	6.9	788.1	87	146
Floor coverings	56.3	8,555.2	659	804
Felt and textile goods, n.e.c.	19.2	1,593.3	217	326
Lace and knit fabric goods . .	46.9	6,633.6	206	234
Coated fabrics, not rubberized	9.0	1,401.5	360	599
Tire cord and fabric	6.1	961.5	19	137
Cordage and twine	7.4	566.3	138	54
Nonwoven fabric	9.3	3,376.5	89	123
Total	522.6	56,840.2	5,668	4,400
Apparel and fabricated textile products:				
Women's hosiery, except socks	32.8	1,642.7	59	56
Hosiery, n.e.c.	37.8	2,270.1	335	60
Apparel made from purchased materials	882.0	50,641.7	30,836	3,146
Curtains and draperies	21.5	1,415.5	65	17
House furnishings, n.e.c. . . .	52.9	5,127.6	1,120	319
Textile bags	9.5	547.0	60	18
Canvas and related products	17.1	917.1	121	21
Pleating, stitching, trimmings, and schiffli embroidery	70.4	5,633.9	92	25
Fabricated textile products, n.e.c.	28.7	3,009.5	1,251	799
Luggage	12.5	1,028.0	1,373	115
Women's handbags and purses	5.8	432.0	1,079	32
Total	1,171.0	72,665.1	36,391	4,608
Textiles and apparel	1,693.6	129,505.3	42,059	9,008

Source: U.S. Department of Labor and U.S. Department of Commerce.

countries and the value of U.S. imports subject to the MFA in 1991. Currently, the United States has bilateral agreements with more than 40 countries.³³

Results of Previous Studies

A number of researchers have examined the economic effects of quota restrictions imposed on textiles and apparel by the United States and by other industrialized countries. The results of these analyses vary because of differences in the type of model used,

³³ As of Aug. 1, 1993, the United States had agreements with, or imposed quotas on, imports from 45 countries and Guam (a U.S. territory).

the time period under review, the scope of the analysis, and the assumptions underlying parameter estimations. The results of recent studies that focus on the United States are shown in table 5.³⁴

³⁴ Researchers have also examined in the impact of the MFA at a regional or global level. See, for example, Junichi Goto, *A Formal Estimation of the Effect of the MFA on Clothing Exports from LDCs*, Policy, Research, and External Affairs Working Papers, WPS455 (Washington, DC: The World Bank, June 1990), and Irene Trela and John Whalley, "Global Effects of Developed Country Trade Restrictions on Textiles and Apparel," *The Economic Journal*, 100 (December 1990), 1190-1205.

Table 4**Textiles and apparel: U.S. general imports subject to the MFA, 1991, and expiration dates of agreements or quotas, by countries, as of March 1993**

Country	Value of imports	Expiration date
	(1,000 dollars)	
Argentina**1	9,371	03/31/92
Bangladesh*	450,225	01/31/95
Brazil**	218,011	03/31/94
China*	3,750,745	12/31/93
Commonwealth of Independent States ²	10,150	12/31/92
Costa Rica*	445,813	12/31/93
Czech Republic and Slovakia*	25,708	05/31/93
Dominican Republic* ³	957,888	12/31/93
Egypt*	126,156	12/31/93
El Salvador*	106,861	12/31/93
Fiji* ¹	27,971	12/31/92
Guam ⁴	(⁵)	07/31/92
Guatemala*	349,586	(⁶)
Haiti	152,421	12/31/93
Hong Kong*	3,941,897	12/31/95
Hungary*	51,862	12/31/93
India*	833,067	12/31/93
Indonesia*	649,024	06/30/94
Jamaica*	254,577	12/31/93
Macao*	390,062	12/31/93
Malaysia*	580,123	12/31/94
Mauritius	98,906	09/30/93
Mexico*	879,395	12/31/93
Myanmar (Burma) ¹	11,677	09/30/92
Nepal	45,209	12/31/93
Nigeria ¹	3,005	12/31/92
Pakistan*	465,045	12/31/93
Panama	63,029	03/31/94
Peru ¹	89,116	12/31/91
Philippines*	1,059,532	12/31/93
Poland*	59,251	12/31/93
Romania	18,182	12/31/93
Singapore*	609,751	12/31/95
South Korea*	2,448,444	12/31/93
Sri Lanka*	505,098	06/30/94
Taiwan	3,196,680	12/31/95
Thailand**	695,590	12/31/93
Trinidad and Tobago ¹	1,232	12/31/91
Turkey*	301,031	12/31/93
United Arab Emirates	83,470	12/31/93
Uruguay*	45,135	06/30/93
Former Yugoslavia ¹	66,670	12/31/92

*Signatory to the MFA Protocol that went into effect on Aug. 1, 1991, as extended through Dec. 31, 1993.

**Provisional acceptance, subject to ratification, of MFA Protocol that went into effect August 1, 1991, as extended through Dec. 31, 1993.

¹ The agreement with this country was allowed to expire without being renewed.

² The former Soviet Union. The Committee for the Implementation of Textile Agreements issued a directive on July 24, 1992, directing that the quota applicable to exports from the former Soviet Union would be applied cumulatively to exports from the 12 successor states for the period January 1, 1992, through December 31, 1992.

³ Subsequent to the original agreement, an additional quota was negotiated and it is scheduled to expire Dec. 31, 1994.

⁴ The agreement with Guam, a U.S. territory, was a "quota exception" for sweaters classified as products of foreign countries, but assembled in this insular area. Quota-free entry was allowed for a specified number of sweaters. Imports in excess of the specified amounts were charged to quotas established for the country of origin, usually the country where the sweater parts were knitted.

⁵ Not applicable.

⁶ Quotas are scheduled to expire Dec. 31, 1993 and Dec. 31, 1994.

Sources: Trade data compiled from official statistics of the U.S. Department of Commerce. Other information from the Office of the United States Trade Representative, Office of the Chief Textile Negotiator; and U.S. Department of Commerce, International Trade Administration, Office of Textiles and Apparel.

Table 5
Textiles and apparel: Summary of selected studies

Study	Base year of estimate	Welfare cost (Billion dollars)	Number of jobs protected (Thousands)
Partial equilibrium:			
Hufbauer et. al.	1984	6.65	640.0
Cline	1986	8.13	234.9
USITC (1989)	1987	(¹)	232.9 - 291.2
General equilibrium:			
de Melo and Tarr ²	1984	11.92	157.2
de Melo and Tarr ³	1984	6.89 - 14.95	18.0 - 449.8
USITC (1991)	1988	(¹)	43.0
Reinert	1988	7.3 - 9.2	(¹)

¹ Not available.

² Removal of quotas only (1990 estimate).

³ Removal of quotas only (1992 estimate).

Sources: G. Hufbauer, D. Berliner, and K. Elliot, *Trade Protection in the United States: 31 Case Studies* (Washington: Institute for International Economics, 1986); William R. Cline, *The Future of World Trade in Textiles* (Washington: Institute for International Economics, 1987); USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase 1: Manufacturing*, publication 2222, Oct. 1989; Jaime de Melo and David Tarr, "Welfare Costs of U.S. Quotas in Textiles, Steel and Autos," *The Review of Economics and Statistics* (Aug. 1990), 489-97; de Melo and Tarr, *A General Equilibrium Analysis of U.S. Foreign Trade Policy* (Cambridge MA: The MIT Press, 1992); USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase III: Services*, publication 2422, Sept. 1991; and Ken Reinert, "Textile and Apparel Protection in the United States: A General Equilibrium Analysis," *The World Economy* (May 1993), 359-76.

Studies vary by whether they are based on partial or general equilibrium analysis. Because partial equilibrium models generally allow for a greater degree of disaggregation, researchers can use these models to examine the effects of trade liberalization on specific sectors of the textile and apparel industries. However, the partial equilibrium models do not capture the interactive effects of trade liberalization on other sectors of the economy. As a result, estimates of economywide welfare effects and of changes in employment generated by the two types of models may differ substantially.³⁵

Because of differences in the base years as well as in other assumptions underlying these studies, it is difficult to directly compare the results shown in table 5 to the estimations discussed in the following section. Nonetheless, the results of all of these studies suggest that trade liberalization in the U.S. textile and apparel sectors would likely have a substantial impact on these sectors and on the overall U.S. economy.

Economic Effects of Removing Import Restraints in Textiles and Apparel

The USITC's computable general equilibrium (CGE) model is used to evaluate the effects of

³⁵ In particular, after controlling for other differences in the models, the partial equilibrium models tend to produce larger estimated declines in employment than those generated by general equilibrium models.

liberalizing the MFA. The model focuses on 22 sectors that are directly affected by the MFA, 3 upstream sectors, 1 downstream sector, and 9 aggregate sectors comprising the rest of the U.S. economy.³⁶ The analysis is divided into two cases. The first case estimates the effect of removing only the MFA quotas, and the second case estimates the removal of both tariffs and quotas in this sector.

Model Specification

MFA quotas control the quantity of imports entering the United States on a product (quota category) basis.³⁷ In some instances, the quota applies only to selected products that fall within the quota category. In general, when exports of products covered by a quota reach the quantity limit specified by the

³⁶ The sectors correspond to 6-digit Bureau of Economic Analysis (BEA) input-output groups that are aggregated from 4-digit SIC categories. Appendix E provides a concordance between the USITC focus sectors, the BEA sectors, and the corresponding SIC industries. Although wool is another upstream sector that is relatively important to certain textile sectors, it was not treated as a separate upstream sector because wool could not be disaggregated from other meat products. Thus, it is included in the aggregated sector - agriculture, forestry, and fisheries. Nonmetal furniture is one of a number of downstream sectors for the textile and textile products industries. It was selected as a downstream sector for the purpose of illustrating the effects of MFA quota and tariff liberalization.

³⁷ Some bilateral agreements also include aggregate or group quotas that encompass a number of individual quota categories.

agreement, no additional products can enter the United States. However, provisions in the bilateral agreements, which often allow for flexibility through "swing," "carry-forward," and "carry-over" provisions, render the systematic analysis of quota utilization difficult.

A quota is considered binding when the quota utilization rate is high enough to effectively inhibit foreign manufacturers from exporting additional production to the United States. Recent studies have assumed that quotas are binding when utilization rates reach 90 percent or greater.³⁸ However, the level at which the quota is assumed to be binding continues to be debated, in part because it is difficult to measure the degree to which foreign exporters can take advantage of the flexibility provisions in the agreements. In some instances, foreign suppliers may have sufficient information to utilize 100 percent of the available quotas. In other cases, up-to-date information on quota utilization levels is not readily available.³⁹ Thus, even though utilization rates for a particular country's products may be well below 100 percent, suppliers may be reluctant to commit additional resources to the production of goods for export to the U.S. market.

For the purpose of this analysis, estimated tariff equivalents are based on the assumption that quotas were effectively binding when utilization rates reached either 80 or 90 percent. The two binding rates provide upper and lower bound estimates, respectively, for each of the two policy experiments discussed below. The assumption that quotas are binding when utilization rates reach 80 percent provides the upper bound for the estimated tariff equivalents, inasmuch as more categories are classified as binding at the 80 percent level and therefore cover a higher percentage of imports.^{40,41}

³⁸ See, for example, Refik Erzan, Junichi Goto, and Paula Holmes, "Effects of the Multi-Fibre Arrangement on Developing Countries' Trade: An Empirical Investigation," in Carl Hamilton, ed. *Textiles Trade and the Developing countries: Eliminating the Multi-Fibre Arrangement in the 1990s* (Washington DC: The World Bank, 1990).

³⁹ For example, Indian textile and apparel producers' ability (or lack thereof) to effectively utilize available quotas is discussed in Rajiv Kumar and Sri Ram Khanna, "India, The Multi-Fibre Arrangement and the Uruguay Round," in Hamilton, ed. *Textiles Trade and the Developing Countries*, 182-214.

⁴⁰ For example, if the utilization rate for a particular category reaches 85 percent, under the upper bound scenario it would be classified as binding; under the lower bound scenario it would not be considered binding (and therefore would have a tariff equivalent of zero).

⁴¹ Given the degree of flexibility afforded many countries with which the United States has bilateral agreements, the tariff equivalents that were estimated on this basis may be overstated for the base year. However, it is important to note that market conditions for these products often change rapidly. Thus, quota utilization rates may differ significantly from year to year for any given country and quota category. In years when U.S. demand for imports is particularly strong, quota utilization rates may be much higher, thus resulting in higher estimated tariff equivalents.

As outlined in chapter 1, the USITC model estimates the effects of the MFA quotas through the use of estimated tariff equivalents. The estimated tariff equivalents used in this analysis were calculated taking into account differences across countries (that is, the extent to which U.S. imports were covered by quotas) and whether or not the quotas were binding. Appendix E provides a complete discussion of the estimation methods that were used to generate these tariff equivalents. The estimated tariff equivalents and trade-weighted average tariffs for each sector are shown in table 6. The degree of protection afforded by the estimated tariff equivalents and the trade weighted tariffs varies across the 22 sectors. These sectoral variations have a significant impact on the estimated effects of trade liberalization discussed below.

The results of both cases are influenced by various parameters used in the estimation process. One parameter reflects an assumption regarding the extent to which quota rents accrue abroad. If the structure of the U.S. market is such that U.S. importers have little or no market power, one would expect foreign exporters to capture 100 percent of the quota rents. However, recent empirical research suggests that concentration in the U.S. import market is sufficient enough to allow U.S. importers to capture a portion of the quota rents generated by the MFA.⁴² Drawing from this research, the analysis specifies that 80 percent of the quota rents accrue to foreign exporters.⁴³

Model Results

The overall effect of liberalizing only the MFA quotas (case 1) results in a welfare gain to the overall U.S. economy, ranging from \$9.6 to \$10.8 billion. Under case 1, prices decline across virtually all of the MFA sectors, with apparel made from purchased materials (apparel), fabricated textile products not elsewhere classified (n.e.c.) and luggage prices declining most significantly (5.9 percent, 4.8 percent, and 1.4 percent, respectively). Across the economy, the elimination of MFA quotas generates a negligible decline in the number of full-time equivalents workers (jobs) of approximately 0.009 percent. However, overall production increases slightly by approximately 0.10 percent (\$5.0 to \$5.6 billion). Case 1 also results in an overall increase in imports ranging from \$4.1 to \$4.7 billion and an overall increase in exports ranging from \$114.0 to \$138.0 million.

When MFA quotas and tariffs are liberalized simultaneously (case 2), the overall effect generates a

⁴² See Refik Erzan, Kala Krishna, and Ling Hui Tan, "Rent Sharing in the Multi-Fibre Arrangement: Theory and Evidence from U.S. Apparel Imports from Hong Kong," (Washington D.C.: The World Bank, 1991), and Geoffrey Bannister, "Rent Sharing in the Multi-Fibre Arrangement: The Case of Mexico," (Washington, DC: The World Bank, 1993).

⁴³ Had the specification been made that 100 percent of the quota rents accrued abroad, corresponding estimates of welfare gains would have been higher.

Table 6
Estimated ad valorem tariff equivalents for MFA quotas and trade-weighted, average MFN tariffs,
by USITC sectors, 1991

(Percent)

	Advalorem tariff equivalents		Average MFN tariff rate ³
	Lower ¹	Upper ²	
Textiles:			
Broadwoven fabric mills	6.9	8.5	12.5
Narrow fabric mills	3.2	3.4	7.4
Yarn mills and textile finishing	4.1	5.1	8.9
Thread mills	4.4	4.6	10.1
Floor coverings	2.8	2.8	5.9
Felt and textile goods, n.e.c.	0.9	1.0	4.8
Lace and knit fabric goods	3.2	3.8	13.2
Coated fabrics, not rubberized	2.0	2.0	9.5
Tire cord and fabric	2.3	2.3	5.6
Cordage and twine	2.9	3.1	4.5
Nonwoven fabric	0.1	0.1	3.5
Apparel and fabricated textile products:			
Women's hosiery, except socks	4.0	5.4	15.7
Hosiery, n.e.c.	2.6	3.5	15.9
Apparel made from purchased materials	14.8	16.8	16.9
Curtains and draperies	5.8	5.9	12.1
House furnishings n.e.c.	8.1	8.3	7.7
Textile bags	5.3	5.9	7.1
Canvas and related products	5.7	6.3	8.0
Pleating, stitching, trimmings, and schiffli embroidery	4.3	12.5	9.5
Fabricated textile products, n.e.c.	8.8	9.2	4.1
Luggage	2.5	2.6	15.7
Women's handbags and purses	1.0	1.0	13.3

¹ Assumes that quotas are binding at a 90 percent utilization rate.

² Assumes that quotas are binding at an 80 percent utilization rate.

³ Ad valorem equivalent.

Source: Estimated by the staff of the USITC

welfare improvement to the U.S. economy, ranging from \$15.3 to \$16.4 billion. Declining prices are more pronounced under this scenario, with the apparel, luggage, and women's handbags and purses (handbags) realizing the most significant declines (11.4, 9.1, and 8.5 percent, respectively). Overall, the elimination of tariffs and quotas also generates a negligible decline in employment of approximately 0.008 percent. Under case 2, the growth in overall production is estimated to be approximately 0.23 percent (\$12.1 to \$12.6 billion). Similarly, import increases range from \$7.8 to \$8.4 billion and export gains amount to approximately \$2.7 billion.

Liberalization in each case results in the depreciation of the U.S. real exchange rate and in a rise in the wage-rental ratio.⁴⁴ For both cases, the effects of removing quotas reflect the extent to which the

⁴⁴ As discussed in chapter 1, these macroeconomic changes influence the effects of liberalization on employment, imports, and exports by increasing the substitution of capital for labor and increasing the relative price of tradeable to nontradeable goods.

sectors are subject to quota-restricted imports. Sectors with relatively high estimated tariff equivalents, such as apparel, fabricated textile products, and broadwoven fabric mills, are more adversely affected. Moreover, the impact of trade liberalization on the textiles sectors is compounded by declines taking place in their downstream industries (for instance, apparel). Conversely, producers in the downstream sectors, such as apparel, benefit from liberalization of trade in upstream sectors that offsets, to some extent, increased import competition.⁴⁵

Tables 7 and 8 present case 1: the effects of liberalizing only the MFA quotas on domestic

⁴⁵ For example, apparel is an important downstream industry for broadwoven fabric mills. In cases 1 and 2, output in the apparel sector declines as a result of liberalization. Consequently, producers of domestically produced broadwoven fabric face declining markets for their products and increased import competition simultaneously. Apparel producers face a similar increase in import competition. However, producers in the apparel sector benefit, to some extent, from reduced prices for inputs such as broadwoven fabric, resulting from tariff and/or quota liberalization.

Table 7
Textiles and apparel, case 1: Economic effects of quota liberalization, value changes, 1991

Sector	Employment		Output		Imports		Exports	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
	— (FTE) ¹ —		—————		Million dollars		—————	
Liberalized sectors:								
Textiles:								
Broadwoven fabric mills	-5,195	-5,980	-703	-810	147	186	-33	-37
Narrow fabric mills	-291	-317	-14	-16	3	3	-3	-3
Yarn mills and textile finishing	-1,711	-1,932	-153	-173	7	9	-3	-3
Thread mills	-157	-173	-19	-21	2	2	-3	-3
Floor coverings	-93	-94	-7	-6	18	18	(²)	(²)
Felt and textile goods, n.e.c.	-144	-160	-16	-18	(²)	(²)	-2	-3
Lace and knit fabric goods	-1,030	-1,151	-145	-162	2	2	-5	-6
Coated fabrics, not rubberized	-58	-61	-12	-13	4	4	-3	-3
Tire cord and fabric	-2	-2	1	1	(²)	(²)	(²)	(²)
Cordage and twine	-44	-47	-3	-3	2	3	(²)	(²)
Nonwoven fabric	-25	-27	-5	-6	(²)	(²)	(²)	(²)
Apparel and fabricated textile products:								
Women's hosiery, except socks	-10	-16	1	1	2	3	(²)	(²)
Hosiery, n.e.c.	-65	-95	-3	-4	8	10	(²)	(²)
Apparel made from purchased materials	-21,944	-24,499	-1,865	-2,082	3,184	3,605	-82	-92
Curtains and draperies	22	30	3	3	4	4	(²)	(²)
House furnishings, n.e.c. . . .	-266	-255	-37	-35	82	84	-1	-1
Textile bags	-44	-50	-3	-3	3	3	(²)	(²)
Canvas and related products	-52	-56	-3	-3	6	7	(²)	(²)
Pleating, stitching, trimmings, and schiffli embroidery . . .	-440	-560	-33	-43	3	11	(²)	(²)
Fabricated textile products, n.e.c.	-1,023	-1,054	-69	-71	54	57	-28	-28
Luggage	-91	-94	-10	-10	22	23	-1	-1
Women's handbags and purses	5	7	2	2	8	8	(²)	(²)
Upstream sectors:								
Cotton	-258	-294	-25	-29	(²)	(²)	-4	-4
Cellulosic man-made fibers . .	-173	-196	-30	-34	-3	-3	(²)	(²)
Noncellulosic organic fibers . .	-1,166	-1,316	-201	-226	-9	-10	-24	-27
Downstream sector:								
Nonmetal furniture	12	15	15	17	2	2	(²)	(²)
Rest of the U.S. economy:								
Agriculture, forestry, and fisheries	-385	-438	143	159	6	7	44	49
Mining	-561	-628	99	110	30	33	9	10
Construction	-236	-264	166	186	(³)	(³)	(³)	(³)
Nondurable manufacturing . .	-1,072	-1,200	926	1,034	76	85	72	80
Durable manufacturing	2,192	2,450	775	866	329	369	52	58
Transportation, communications, and utilities	1,300	1,449	708	791	59	67	65	72
Wholesale and retail trade . .	5,047	5,657	960	1,074	(³)	(³)	(³)	(³)
Finance, insurance, and real estate	585	669	2,220	2,485	10	11	31	34
Other services	18,429	20,653	2,337	2,616	53	59	33	36

¹ Full-time equivalent jobs.

² Change less than \$1 million.

³ Nontradeable sector.

Source: Estimated by the staff of the USITC.

Table 8
Textiles and apparel, case 1: Economic effects of quota liberalization, percentage changes, 1991
(Percentage changes)

Sector	Employment		Output		Imports		Exports	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
Liberalized sectors:								
Textiles:								
Broadwoven fabric mills	-2.3	-2.7	-2.3	-2.6	4.2	5.4	-2.1	-2.4
Narrow fabric mills	-1.3	-1.4	-1.2	-1.3	1.9	2.0	-1.2	-1.3
Yarn mills and textile finishing	-1.7	-1.9	-1.6	-1.8	2.5	3.2	-1.5	-1.7
Thread mills	-2.3	-2.6	-2.3	-2.5	1.9	1.8	-2.1	-2.4
Floor coverings	-0.2	-0.2	-0.1	-0.1	2.7	2.7	(¹)	(¹)
Felt and textile goods, n.e.c	-0.8	-0.9	-0.7	-0.8	0.2	0.2	-0.7	-0.8
Lace and knit fabric goods	-2.4	-2.7	-2.4	-2.6	0.8	1.1	-2.3	-2.6
Coated fabrics, not rubberized	-0.7	-0.7	-0.6	-0.6	1.1	1.0	-0.6	-0.6
Tire cord and fabric	(¹)	(¹)	(¹)	0.1	2.2	2.2	(¹)	(¹)
Cordage and twine	-0.6	-0.7	-0.6	-0.6	2.2	2.3	-0.6	-0.6
Nonwoven fabric	-0.3	-0.3	-0.2	-0.2	-0.1	-0.1	-0.2	-0.2
Apparel and fabricated textile products:								
Women's hosiery, except socks	(¹)	-0.1	(¹)	(¹)	4.1	5.5	(¹)	(¹)
Hosiery, n.e.c.	-0.2	-0.3	-0.1	-0.2	2.3	3.1	-0.1	-0.1
Apparel made from purchased materials	-2.8	-3.2	-2.8	-3.1	10.3	11.7	-2.6	-2.9
Curtains and draperies	0.1	0.1	0.1	0.2	5.6	5.7	0.4	0.5
House furnishings, n.e.c.	-0.5	-0.5	-0.5	-0.5	7.3	7.5	-0.3	-0.2
Textile bags	-0.5	-0.5	-0.4	-0.5	4.6	5.1	-0.2	-0.2
Canvas and related products	-0.3	-0.3	-0.2	-0.2	5.0	5.6	0.1	0.1
Pleating, stitching, trimmings, and schiffli embroidery	-0.7	-0.8	-0.6	-0.7	3.6	11.6	-0.4	-0.6
Fabricated textile products, n.e.c	-3.7	-3.8	-3.6	-3.7	4.4	4.5	-3.4	-3.5
Luggage	-0.9	-0.9	-0.8	-0.9	1.6	1.7	-0.7	-0.7
Women's handbags and purses	0.1	0.1	0.2	0.2	0.7	0.8	1.1	1.2
Upstream sectors:								
Cotton	-0.6	-0.7	-0.5	-0.5	-0.9	-1.0	-0.1	-0.2
Cellulosic man-made fibers	-1.5	-1.7	-1.5	-1.7	-1.5	-1.7	-1.6	-1.8
Noncellulosic organic fibers	-1.4	-1.5	-1.3	-1.5	-1.3	-1.5	-1.3	-1.5
Downstream sector:								
Nonmetal furniture	(¹)	(¹)	0.1	0.1	0.1	0.1	0.1	0.1
Rest of the U.S. economy:								
Agriculture, forestry, and fisheries	(¹)	(¹)	0.1	0.1	0.1	0.1	0.2	0.2
Mining	(¹)	-0.1	0.1	0.1	0.1	0.1	0.1	0.1
Construction	(¹)	(¹)	(¹)	(¹)	(²)	(²)	(²)	(²)
Nondurable manufacturing	(¹)	(¹)	0.1	0.1	0.1	0.1	0.1	0.1
Durable manufacturing	(¹)	(¹)	(¹)	0.1	0.1	0.1	(¹)	(¹)
Transportation, communications, and utilities	(¹)	(¹)	0.1	0.1	0.1	0.1	0.1	0.1
Wholesale and retail trade	(¹)	(¹)	0.1	0.1	(²)	(²)	(²)	(²)
Finance, insurance, and real estate	(¹)	(¹)	0.2	0.2	0.1	0.1	0.2	0.2
Other services	(¹)	(¹)	0.1	0.1	0.1	0.1	(¹)	(¹)

¹ Change less than one-tenth of 1 percent.

² Nontradeable sector.

Source: Estimated by the staff of the USITC.

employment, output, and trade in absolute and percentage terms, respectively. With the exception of curtains and draperies and handbags, all of the sectors directly affected by quota liberalization show declines in employment.⁴⁶ Apparel and broadwoven fabric mills exhibit the greatest declines, over 20,000 jobs and over 5,000 jobs, respectively. In percentage terms, fabricated textile products, n.e.c. experiences the largest decline (3.7 to 3.8 percent). Production declines also occur across most of the sectors, with apparel and fabricated textile products, n.e.c. experiencing the largest decreases (2.8 to 3.1 and 3.6 to 3.7 percent, respectively). Generally, imports increase and exports decline across the highlighted sectors. However, for a number of sectors, the changes amount to less than \$1 million per sector.

Under case 1, all of the upstream sectors show declines in employment and production, resulting, in part, from declines in domestic production in the various textile sectors that use these inputs. However, in percentage terms, the changes are relatively small (less than 2 percent from the base amount). The downstream sector, nonmetal furniture, experiences small improvements in employment and production that result, in part, from changes in the prices of the textile inputs used by this sector.⁴⁷ Aggregate sectors comprising the rest of the economy, including downstream sectors such as wholesale and retail trade, also generally benefit from quota elimination. However, gains in employment and production tend to be quite small (two-tenths of a percent or less).⁴⁸

Tables 9 and 10 present case 2: the effects of liberalizing both tariffs and quotas on the sectors directly affected by the MFA. With the exception of tire cord and fabric and curtains and draperies, all of the sectors directly affected by the MFA show declines

⁴⁶ Quota liberalization results in lower prices for the curtains and draperies sector's primary material input (broadwoven fabric) and higher prices for its exports. These changes generate growth in domestic production and exports that are large enough to outweigh the substitution of capital for labor caused by the increase in the wage-rental ratio. Consequently, employment in this sector increases slightly. The slight gain in employment realized by the handbag sector occurs for similar reasons.

⁴⁷ Nonmetal furniture consists of wood household furniture, household furniture n.e.c., upholstered household furniture, mattresses and bedsprings, wood office furniture, and public building furniture. In particular, upholstered furniture and mattresses and bedsprings are important downstream users of products classified under broadwoven fabric mills and felt and textile goods n.e.c.

⁴⁸ As discussed above, the elimination of quotas and tariffs results in price declines across the majority of the textile and apparel sectors. At the macroeconomic level, the benefits from these price declines that are realized by the household sector ultimately generate an increase in the demand for additional goods and services. This increased demand translates into an increase in the demand for retail and wholesale services.

in employment and production.⁴⁹ Apparel and broadwoven fabric mills experience the largest declines, with losses of approximately 47,000 and 12,000 jobs, respectively. In addition, imports increase in all of the sectors, with the largest increase, in absolute and percentage terms, occurring in the apparel sector (\$7.1 billion or 24.5 percent). Exports generally decline across most of the sectors.⁵⁰

The sectors most affected by trade liberalization tend to be those protected by relatively high ad valorem tariffs. For example, although luggage experiences relatively modest declines as a result of quota liberalization (case 1), the sector experiences the largest decline in production (in percentage terms) as a result of simultaneous tariff and quota elimination. In terms of the upper bound estimates, the sectors experiencing the greatest declines in employment are luggage (6.2 percent), apparel (6.0 percent), broadwoven fabric mills (5.5 percent), thread mills (5.4 percent), and lace and knit fabric goods (5.4 percent).

The effects on upstream sectors differ somewhat from those under case 1. The cotton sector shows increased exports, partially generated by the relative decline in the real exchange rate. However, the export growth does not offset the decrease in U.S. demand for cotton, since this sector experiences declines in production and employment. The cellulosic man-made fiber and noncellulosic organic fiber sectors are negatively affected by declines in the domestic market for their products; both sectors experience declines in employment, production, and exports under this scenario.

As with case 1, the downstream sector, nonmetal furniture, benefits from trade liberalization. Tariff and quota elimination generate declines in the prices of various textile inputs used by the nonmetal furniture sector, thereby leading to slight increases in the sector's employment and production. In addition, aggregate sectors comprising the rest of the economy generally show gains in employment and production. In this case, the price declines that result from tariff and quota liberalization exceed those generated by the elimination of quotas shown in case 1. The larger price declines coupled with simultaneous changes in the wage-rental ratio and real exchange rate result in slightly larger changes in trade, domestic production, and employment across the rest of the economy.

⁴⁹ Despite declines in employment, production increases slightly in the tire cord sector. However, in percentage terms, these changes amount to 0.1 percent or less. As discussed above, one outcome of this scenario is an increase in the wage-rental ratio. Thus, the sector's production growth and employment decline may be the result of substituting capital for labor.

⁵⁰ The tire cord, curtains and draperies, house furnishings, and canvas products sectors all register small gains in exports under this scenario. Exports of handbags show a more substantial increase (12.3 percent).

Table 9
Textiles and apparel, case 2: Economic effects of quota and tariff liberalization, value changes, 1991

Sector	Employment		Output		Imports		Exports	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
	— (FTE) ¹ —				Million dollars			
Liberalized sectors:								
Textiles:								
Broadwoven fabric mills	-11,598	-12,346	-1,574	-1,676	448	491	-71	-76
Narrow fabric mills	-681	-706	-34	-36	11	12	-6	-6
Yarn mills and textile finishing	-3,744	-3,954	-336	-355	25	28	-6	-6
Thread mills	-351	-366	-43	-45	7	7	-7	-7
Floor coverings	-244	-246	-27	-26	54	54	(²)	(²)
Felt and textile goods, n.e.c	-342	-357	-39	-41	7	7	-5	-5
Lace and knit fabric goods . .	-2,202	-2,316	-311	-328	22	22	-11	-12
Coated fabrics, not rubberized	-227	-231	-51	-52	26	25	-14	-14
Tire cord and fabric	-3	-4	2	2	1	1	(²)	(²)
Cordage and twine	-97	-100	-6	-6	7	8	-1	-1
Nonwoven fabric	-48	-50	-10	-11	2	2	(²)	(²)
Apparel and fabricated textile products:								
Women's hosiery, except socks	-88	-94	-3	-3	12	13	(²)	(²)
Hosiery, n.e.c.	-616	-645	-31	-33	52	55	-1	-1
Apparel made from purchased materials	-44,311	-46,724	-3,770	-3,976	7,078	7,554	-165	-174
Curtains and draperies	33	42	4	5	11	11	(²)	(²)
House furnishings, n.e.c. . . .	-445	-434	-61	-59	158	160	(²)	1
Textile bags	-96	-101	-6	-6	6	7	(²)	(²)
Canvas and related products	-112	-117	-7	-7	15	15	(²)	(²)
Pleating, stitching, trimmings, and schiffli embroidery . . .	-857	-974	-64	-74	11	19	(²)	(²)
Fabricated textile products, n.e.c	-1,229	-1,261	-81	-83	75	78	-29	-29
Luggage	-627	-629	-72	-72	147	148	-5	-5
Women's handbags and purses	-27	-26	-1	-1	91	92	4	4
Upstream sectors:								
Cotton	-373	-409	-33	-36	(²)	(²)	14	13
Cellulosic man-made fibers . .	-374	-396	-65	-69	-7	-7	-1	-1
Noncellulosic organic fibers . .	-2,533	-2,675	-438	-463	-22	-23	-50	-53
Downstream sector:								
Nonmetal furniture	26	29	29	31	2	2	1	1
Rest of the economy:								
Agriculture, forestry, and fisheries	3,014	2,951	705	719	-4	-4	423	427
Mining	-250	-317	342	353	41	44	53	54
Construction	-255	-282	350	368	(³)	(³)	(³)	(³)
Nondurable manufacturing . .	501	369	2,341	2,442	-139	-130	394	401
Durable manufacturing	20,235	20,426	4,010	4,089	-200	-159	1,159	1,161
Transportation, communications, and utilities	6,095	6,223	1,910	1,987	-109	-102	475	481
Wholesale and retail trade . .	5,974	6,563	1,616	1,725	(³)	(³)	(³)	(³)
Finance, insurance, and real estate	-1,839	-1,751	3,641	3,894	-13	-11	115	118
Other services	30,077	32,197	4,196	4,461	-58	-51	391	393

¹ Full-time equivalent jobs.

² Change less than \$1 million.

³ Nontradeable sector.

Source: Estimated by the staff of the USITC.

Table 10
Textiles and apparel, case 2: Economic effects of quota and tariff liberalization, percentage changes, 1991

(Percentage changes)

Sector	Employment		Output		Imports		Exports	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
Liberalized sectors:								
Textiles:								
Broadwoven fabric mills	-5.2	-5.5	-5.1	-5.4	13.0	14.2	-4.6	-4.9
Narrow fabric mills	-3.0	-3.1	-2.9	-3.0	7.1	7.2	-2.7	-2.8
Yarn mills and textile finishing	-3.7	-3.9	-3.6	-3.8	9.1	9.9	-3.3	-3.5
Thread mills	-5.2	-5.4	-5.2	-5.4	8.2	8.1	-4.7	-4.9
Floor coverings	-0.4	-0.4	-0.2	-0.2	8.2	8.2	(¹)	(¹)
Felt and textile goods, n.e.c. .	-1.8	-1.9	-1.7	-1.8	3.2	3.3	-1.6	-1.7
Lace and knit fabric goods	-5.1	-5.4	-5.0	-5.3	10.6	10.9	-4.8	-5.0
Coated fabrics, not rubberized	-2.6	-2.6	-2.5	-2.5	7.1	7.0	-2.3	-2.3
Tire cord and fabric	-0.1	-0.1	0.1	0.1	7.1	7.1	0.2	0.2
Cordage and twine	-1.4	-1.4	-1.2	-1.3	5.4	5.6	-1.1	-1.2
Nonwoven fabric	-0.5	-0.6	-0.4	-0.4	2.6	2.6	-0.3	-0.3
Apparel and fabricate textile products:								
Women's hosiery, except socks	-0.3	-0.3	-0.1	-0.2	19.8	21.4	(¹)	(¹)
Hosiery, n.e.c.	-1.7	-1.8	-1.6	-1.7	15.7	16.5	-1.2	-1.3
Apparel made from purchased materials	-5.7	-6.0	-5.6	-5.9	23.0	24.5	-5.2	-5.5
Curtains and draperies	0.2	0.2	0.2	0.2	17.3	17.4	1.3	1.4
House furnishings, n.e.c. . . .	-0.9	-0.9	-0.8	-0.8	14.2	14.3	0.1	0.2
Textile bags	-1.1	-1.1	-0.9	-1.0	10.6	11.1	-0.1	-0.1
Canvas and related products	-0.7	-0.7	-0.5	-0.5	12.0	12.6	0.6	0.6
Pleating, stitching, trimmings, and schiffli embroidery . . .	-1.3	-1.4	-1.1	-1.3	12.0	20.7	-0.4	-0.5
Fabricated textile products, n.e.c.	-4.5	-4.6	-4.3	-4.4	6.0	6.2	-3.6	-3.7
Luggage	-5.7	-6.2	-6.0	-6.0	10.7	10.8	-4.4	-4.4
Women's handbags and purses	-0.3	-0.3	-0.1	-0.1	8.5	8.5	12.3	12.3
Upstream sectors:								
Cotton	-0.9	-0.9	-0.6	-0.7	-2.2	-2.3	0.5	0.5
Cellulosic man-made fibers . .	-3.3	-3.5	-3.3	-3.5	-3.5	-3.7	-3.2	-3.4
Noncellulosic organic fibers . .	-3.0	-3.1	-2.9	-3.0	-3.1	-3.3	-2.8	-2.9
Downstream sector:								
Nonmetal furniture	(¹)	(¹)	0.1	0.1	0.1	0.1	0.2	0.2
Rest of the economy:								
Agriculture, forestry, and fisheries	0.2	0.2	0.5	0.5	(¹)	(¹)	1.9	2.0
Mining	(¹)	(¹)	0.3	0.3	0.1	0.1	0.7	0.7
Construction	(¹)	(¹)	0.1	0.1	(²)	(²)	(²)	(²)
Nondurable manufacturing . . .	(¹)	(¹)	0.2	0.2	-0.1	-0.1	0.4	0.4
Durable manufacturing	0.2	0.2	0.3	0.3	-0.1	-0.1	0.4	0.4
Transportation, communications, and utilities	0.1	0.1	0.2	0.2	-0.2	-0.2	0.6	0.6
Wholesale and retail trade . . .	(¹)	(¹)	0.1	0.2	(²)	(²)	(²)	(²)
Finance, insurance, and real estate	(¹)	(¹)	0.3	0.3	-0.2	-0.1	0.7	0.8
Other services	0.1	0.1	0.1	0.2	-0.1	-0.1	0.5	0.5

¹ Change less than one-tenth of 1 percent.

² Nontradeable sector.

Source: Estimated by the staff of the USITC.

Machine Tools

In March 1983, the National Machine Tool Builders Association submitted a petition under section 232 of the Trade Expansion Act of 1962 recommending quotas on certain U.S. imports of metalworking machine tools, based on the view that such imports threaten the U.S. national security. After considering mobilization, defense, and economic planning factors, the President announced on May 20, 1986, that Voluntary Restraint Agreements (VRAs) would be sought with Japan, Taiwan, West Germany, and Switzerland.⁵¹ In December 1986, agreements were concluded with Japan and Taiwan. West Germany and Switzerland were informed that their exports to the United States should not exceed certain levels and that their exports would be monitored. In addition, the U.S. Government requested that seven other countries maintain their U.S. market shares for machine tools.⁵²

Current Operation of the Machine Tool VRAs⁵³

The machine tool VRAs with Japan and Taiwan were extended from January 1, 1987, through December 31, 1991. The VRAs have been extended for 2 more years, from January 1, 1992, through December 31, 1993, but are less restrictive than the original VRAs.⁵⁴ However, since the base period of this report is 1991, the analysis estimates the economic effects of removing the machine tool VRAs that were in effect in 1991.

⁵¹ Import restraints were part of a U.S. machine tool revitalization plan, called the Domestic Action Plan, initiated by the President in December 1986. The other part of the plan committed the U.S. Government to assist and fund a variety of research and development activities to help modernize U.S. machine tool and manufacturing technology. The plan has been administered by the Departments of Defense and Commerce and has included participation by the U.S. Navy, the National Institutes of Standards and Technology, the Export-Import Bank, and private sector firms.

⁵² Brazil, Italy, Korea, Singapore, Spain, Sweden, and the United Kingdom are the other seven countries. These seven countries plus West Germany and Switzerland were the next largest machine tool foreign supplier countries to the United States after Japan and Taiwan. These nine "other" countries were asked to limit their machine tool exports to the United States to allow the domestic industry the opportunity to be the primary beneficiary of reduced imports from Japan and Taiwan.

⁵³ For a more detailed discussion of the history of the VRAs, see USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase I: Manufacturing*, publication 2222, Oct. 1989.

⁵⁴ The more recent VRAs apply only to the numerically controlled machine tools included in the original VRAs and allow for phased increases in the ceiling levels over the original VRA levels.

The VRA with Japan covered numerically controlled (NC) and non-numerically controlled (non-NC) lathes, machining centers, milling machines, and NC and non-NC punching and shearing machines.⁵⁵ The VRA with Taiwan covered all of these products except the punching and shearing machines. Both of the VRAs covered imports of the specified products in several forms: completed assemblies, knock-down kits for later assembly in the United States, and certain machine tool subassemblies.

The VRAs that were in effect in 1991 with Japan and Taiwan required that these countries issue export licenses. The VRA with Japan required export licenses only for NC lathes, machining centers, and NC punching and shearing machines. The remaining products were limited through administrative guidance from the Government of Japan. The VRA with Taiwan required export licenses for all the products covered.

Japan and Taiwan agreed to limit their machine tool exports to the United States to a specified share of U.S. apparent consumption for each of the specified product categories. The following tabulation shows the VRA quota limits on U.S. machine tool imports as a percentage of U.S. consumption.

Type of Machine	Japan	Taiwan
NC lathes	57.47%	3.23%
Non-NC lathes	4.81	14.70
Machining center	51.54	4.66
Milling machines	3.15	19.29
NC punching & shearing machines ...	19.25	-
Non-NC punching & shearing machines ...	9.14	-

Annual data from 1989-91 for U.S. producers' domestic shipments and employment, total U.S. imports, and total U.S. exports are shown in table 11.⁵⁶ Fully adjusted quota-limit figures and exports to the United States from Japan and Taiwan for the VRA are shown for 1991 in table 12. Japan's exports to the United States are well below its specified quota levels, whereas Taiwan's exports nearly met its quota level in 1991. Trade sources indicate that Japan began expanding its machine tool production in the United States shortly after the VRA agreement went into effect, thereby reducing the number of machine tools it needed to export to the United States to meet U.S. demand for the Japanese products.⁵⁷

⁵⁵ Total U.S. imports under these six product categories account for about half of total U.S. machine tool imports.

⁵⁶ Annual U.S. production of the VRA-controlled machine tools accounted for about 35 percent of total annual U.S. machine tool production.

⁵⁷ Officials at the U.S. Department of Commerce and at the Association for Manufacturing Technology (formerly the National Machine Tool Builders Association) indicated that Japanese production in the United States since 1987 has increased, with numerous new U.S. plants and expansions by leading Japanese manufacturers, such as Toyoda Machinery U.S.A., Mazak Corp., and Okuma

Table 11
Machine tools: Summary data, 1989-91¹

(Million dollars, except where indicated)

Item	1989	1990	1991
Shipments	4,857	4,806	4,291
Employment (<i>workers</i>)	46,000	44,900	41,500
Imports	2,982	2,795	2,587
Exports	1,574	1,600	1,555

¹ The machine tool sector includes SIC 4-digit industries 3541 and 3542.

Source: U.S. Department of Commerce.

Table 12
Machine tools from Japan and Taiwan: Quantity of quotas and of exports to the United States, 1991

Country	Exports	Quota	Percent Filled
Japan	4,045	5,121	79.0
Taiwan	2,293	2,467	92.9

Source: U. S. Department of Commerce, Office of Agreements Compliance.

Economic Effects of Removing the Machine Tool VRAs

The USITC CGE model is used to evaluate the effects of removing the machine tool VRAs with Taiwan; the quotas were generally not binding for Japan and, therefore, their removal would not have an effect. The model details one machine tool sector, upstream sectors relevant to machine tools, and nine aggregate sectors representing the rest of the U.S. economy. Examination of downstream relations found that machine tools are consumed primarily by industries within durable manufacturing, with downstream purchases being distributed evenly among most of these industries. Therefore, within the sectoring scheme of the model, durable manufacturing, which is listed as one of the aggregate sectors, is also on the whole, the dominant downstream consumer of machine tools.

Previous studies of the effects of the machine tool VRAs have found, for the most part, modest effects. Dinopoulos and Kreinin found that the quota rents accrued to Japanese and Taiwan exporters amounted to \$110 million and \$10 million, respectively, in 1987; the USITC, in a 1989 study, found that the cumulative quota rents to both Japanese and Taiwan exporters in 1987 and 1988 ranged from \$5 to \$33 million.⁵⁸

⁵⁷—Continued

Machinery, Inc. These new plants and expansions reportedly use the latest production technology and automation. In fact, the Japanese producers in the United States were some of the biggest supporters for the extension of the VRAs.

⁵⁸ See Dinopoulos and Kreinin, "The U.S. VER on Machine Tools: Causes and Effects," Robert Baldwin, ed., *Empirical Studies of Commercial Policy* (Chicago: University of Chicago Press, 1991); and USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase I: Manufacturing*, publication 2222, Oct. 1989.

An upper bound VRA premium of 10 percent is used in this analysis for Taiwan, and is based on price-gap estimates by Dinopoulos and Kreinin.⁵⁹ However, the VRA categories from Taiwan accounted for only a small share, approximately 2 percent, of total imports for the machine tool sector as defined in the USITC model. Therefore, a trade-weighted quota premium is applied to this sector, and it amounts to only 0.2 percent.

Liberalization of the machine tool sectors results in removing both the trade-weighted quota premium of 0.2 percent and the 4.3 percent tariff applied to the sector. The USITC model estimates that quota rents of \$6 million accrued to Taiwanese exporters in 1991. This is similar in magnitude to the estimates of the previous studies discussed above. The overall effect of liberalizing the machine tool sector results in a welfare gain to the U.S. economy of \$31 million. Given the small size of the estimated tariff equivalent and quota rents, most of this gain is a result of the removal of the tariff and the resulting 1.6 percent fall in the overall price of machine tools experienced by consumers. Across the economy, net changes in output and employment are negligible. In addition, net imports increase by \$3 million and net exports increase by \$21 million.

Table 13 presents the economic effects of liberalizing the machine tool sector on employment, output, exports, and imports in the machine tool sector and its significant upstream and downstream sectors.

⁵⁹ Dinopoulos and Kreinin econometrically estimated the price function for the restricted categories between 1971-86. The estimated coefficients were used to obtain the predicted prices of machine tools for years after the quotas went into effect in 1987. The difference between the actual and the predicted values was considered the price effect of the VRA. For further discussion, see Dinopoulos and Kreinin (1991).

Table 13
Machine tools: Economic effects of removing the VRAs, 1991

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
Liberalized sector:								
Machine tools	-695	-1.1	-74	-1.1	60	2.0	-14	-0.8
Upstream sectors:								
Steel mills	-2	(4)	-2	(4)	-1	(4)	(3)	(4)
Steel foundry	-13	(4)	-2	(4)	(3)	(4)	(3)	(4)
Machine tool accessories ...	-11	(4)	-1	(4)	(3)	(4)	(3)	(4)
Machinery, n.e.c.	-17	(4)	-2	(4)	(3)	(4)	(3)	(4)
Electrical industrial equipment	-36	(4)	-4	(4)	-1	(4)	-1	(4)
Engineering services	-18	(4)	-1	(4)	(3)	(4)	(3)	(4)
Rest of the U.S. economy:								
Agriculture, forestry, and fisheries	58	(4)	8	(4)	(3)	(4)	5	(4)
Mining	14	(4)	2	(4)	(3)	(4)	(3)	(4)
Construction	5	(4)	1	(4)	(5)	(5)	(5)	(5)
Nondurable manufacturing ..	93	(4)	17	(4)	-4	(4)	4	(4)
Durable manufacturing	246	(4)	38	(4)	-14	(4)	17	(4)
Transportation, commu- nications, and utilities	66	(4)	10	(4)	-3	(4)	5	(4)
Wholesale and retail trade	15	(4)	1	(4)	(5)	(5)	(5)	(5)
Finance, insurance, and real estate	30	(4)	6	(4)	(3)	(4)	1	(4)
Other services	218	(4)	12	(4)	-2	(4)	4	(4)

¹ Full-time equivalent jobs.

² In millions of dollars in base year prices.

³ Change less than \$1 million dollars.

⁴ Change less than one-tenth of 1 percent.

⁵ Nontradeable sector.

Source: Estimated by the staff of the USITC.

The effect of lost protection in the machine tool sector is a fall in domestic output and employment of \$74 million and 695 jobs, respectively. Both figures represent approximately 1 percent declines. The largest trade effects were also concentrated in the machine tool sector with imports increasing by 2 percent and exports declining by 0.8 percent. As expected, upstream sectors are hurt by liberalization of the machine tool sector, and durable manufacturing, downstream to the machine tool sector, benefits. But overall, the trade, employment, and output effects in these other sectors were even smaller than with machine tools, measuring less than 0.1 percent.

Automobiles

The Government of Japan manages the voluntary export restraint (VER)⁶⁰ of Japanese-manufactured

⁶⁰ The VER is administered by the Ministry of International Trade and Industry (MITI). This restraint is referred to as a VER instead of a VRA because at this time there is no formal agreement between the United States and Japan to limit automobile exports.

motor vehicles exported to the United States.⁶¹ The VER has been in place since Japan fiscal year (JFY) 1981 (JFY starts April 1 of each year). The original limit on passenger automobiles was 1.68 million vehicles per Japan fiscal year. The limit was raised in JFY 1984 to 1.85 million vehicles. From JFY 1985 through JFY 1991, the limit was 2.3 million vehicles. For JFY 1992, the limit on passenger automobiles was reduced to 1.65 million units. The Japan Automobile Manufacturers Association (JAMA) monitors exports for the Japanese Government.⁶²

Passenger car exports subject to the VER in JFY 1987 totaled 2.214 million units, a level below the VER limits (2.3 million units) for the first time. In JFYs 1988, 1989, 1990, 1991, and 1992, passenger car

⁶¹ This trade restraint applies to on-the-highway automobiles, vans, and 4-wheel-drive utility vehicles, designed primarily to transport passengers. With a few exceptions, motor vehicles that carry more than nine passengers are not normally considered automobiles. The quota on vans and 4-wheel drive vehicles has been separate from the quota on passenger automobiles.

⁶² For history and background material, see *The Economic Effects of Significant U.S. Import Restraints: Phase I, Manufacturing*, publication 2222, Oct. 1989.

exports totaled 2,178, 1,954, 1,850, 1,731, and 1,568 million units, respectively. Each of these levels are below the overall VER limits in each year. It is difficult to say definitively whether companies meet their quotas because the Japanese government does not make company quotas public. However, estimates of company allocations are readily available (see table 14).

Exports of all companies were below their allocations in JFY 1991. Mazda was the closest to filling its allocation—exporting 93 percent of its quota, and Mitsubishi was next at 85 percent. Since all companies were below their allocations in 1991, no quota premium can be established. In general, nonbinding quotas do not have a direct effect on the price of imported automobiles. Therefore, elimination of the VER in 1991 would not have caused a direct decline of imported automobile prices. Consequently, the modeling technique employed in this report would yield no measurable effect.

When the VER was most restrictive in 1983 and 1984, Robert Feenstra estimated a quota premium of more than \$1,000 per car.⁶³ Using a different technique, Robert Crandall estimated quota premiums of \$1,700 in 1983 and \$2,400 in 1984.⁶⁴ Feenstra also demonstrated “quality upgrading” through 1985, as Japanese manufacturers exported bigger cars with more options into the United States as a response to the restrictions. De Melo and Tarr applied Feenstra’s

⁶³ Robert C. Feenstra, “Quality Change Under Trade Restraints in Japanese Autos,” *Quarterly Journal of Economics* (Feb. 1988), 131-46.

⁶⁴ Robert W. Crandall, “The effects of U.S. Trade Protection for Autos and Steel,” *Brookings Papers on Economic Activity* (1987), 271-88.

estimate of the quota premium on automobiles in a general equilibrium model for the year 1984 and found a welfare gain of \$7.5 billion from lifting the VRA and a quota rent recapture from the Japanese of nearly \$8 billion, both in 1984 dollars, and a slight loss in automobile industry employment after economywide effects were taken into account.⁶⁵

The demand for Japanese passenger cars subject to VER has dropped considerably in recent years because of two major developments. First, between 1985 and 1988, the value of the yen roughly doubled relative to the U.S. dollar, sharply increasing the dollar cost of selling Japanese-produced cars in the United States. Second, at the same time, partly in response to the high yen, and partly as a means of circumventing the VER, many Japanese automobile manufacturers built assembly plants in the United States.

It is possible that nonbinding quotas cause firms to engage in practices that lead to market distortions relative to a free-trade regime, but such effects are difficult to measure. One phenomenon of recent years is the growth in sales of Japanese luxury cars. The Acura Legend was introduced by Honda in 1986, and, since that time, Infiniti brand vehicles, produced by Nissan, Lexus brand vehicles, produced by Toyota, the Mitsubishi Diamonte, and the Mazda 929 have been introduced into the U.S. market. Sales of these imported luxury cars have increased from about 1 percent of the 2.38 million Japanese imports sold in 1986 to 14 percent of the 1.50 million sold in 1991. All of these luxury cars are produced in Japan. There are several possible explanations of this development.

⁶⁵ Jaime de Melo and David Tarr, “Welfare Costs of U.S. Quotas in Textiles, Steel and Autos,” *Review of Economics and Statistics* (Aug. 1990), 489-97.

Table 14
Japanese passenger automobile quotas and exports to the United States, by company, JFYs 1989-92

(Units)

	Quota ¹	Actual exports			Quota ¹	Actual exports
	JFYs 89-91	JFY 89	JFY 90	JFY 91	JFY 92	JFY 92
Toyota	610,340	551,324	551,189	510,489	480,000	482,000
Nissan	532,775	354,099	350,423	324,132	290,000	289,600
Honda	421,844	409,500	368,908	339,959	320,000	285,440
Mazda	226,116	226,116	205,727	210,208	200,000	197,700
Mitsubishi	193,658	162,084	163,111	165,284	160,000	154,800
Isuzu	124,210	124,210	120,822	93,100	100,000	67,700
Fuji	106,805	60,813	53,150	51,158	70,000	69,400
Suzuki	64,252	54,192	33,823	30,236	30,000	21,654
Daihatsu	20,000	12,026	2,478	5,910	0	0
Total	2,300,000	1,954,364	1,849,631	1,730,476	1,650,000	1,568,294

¹ Estimated.

Sources: Quota estimate for JFYs 89-91 is a slight modification of estimates from Japan Economic Institute, *JEI Report*, May 1, 1992. Quota estimate for JFY 1992 is from *Automotive News*, May 20, 1993. Actual exports are ultimately from the Japan Automobile Manufacturers Association.

One is that it represents a form of "quality upgrading" in the face of continued, but nonbinding quotas. One problem with this thesis is that as the VER has become less likely to be binding, sales of Japanese luxury cars have increased.⁶⁶ A second explanation is that the introduction of luxury vehicles represents a normal response to market forces. The argument here is that many owners of mid-sized Japanese nameplates such as the Honda Accord and the Toyota Camry who had been looking for a luxury upgrade acquired a preference for Japanese products. In the mid-80s, their choices were limited to such U.S. models as Cadillac, Lincoln, and Chrysler, and to such European models as Mercedes-Benz and BMW. A market niche opened that Japanese companies chose to exploit with the introduction of their luxury lines.

The VER could be restrictive in the future, especially since the quota has been reduced. Five of the eight remaining Japanese exporters to the U.S. market were probably constrained by their allocations in JFY 1992. A strong U.S. economic recovery, not counterbalanced by the most recent rise in the yen or by the improved competitiveness of U.S. automobile makers, could lead to all companies being constrained by their allocations and resulting upward pressure on automobile prices.

Steel

In 1984, the United States Trade Representative (USTR) began negotiation of VRAs that were eventually finalized with 19 countries and the European Community (EC) (excluding Portugal and Spain, which negotiated separate agreements).⁶⁷ The VRAs, which applied to carbon and specialty steel,⁶⁸ were to cover a five year period from October 1, 1984 through September 30, 1989.⁶⁹ In July 1989,

⁶⁶ Total Japanese exports to the United States were 25 percent below the overall quota in JFY 1991. See *Wards Automotive Yearbook*, 1988 and 1992.

⁶⁷ The countries with which agreements were reached are Australia, Austria, Brazil, Czechoslovakia, East Germany, Finland, Hungary, Japan, Mexico, China, Poland, Portugal, Korea, Romania, South Africa, Spain, Trinidad and Tobago, Venezuela, Yugoslavia, and the EC (Belgium, Denmark, France, Greece, Ireland, Italy, Luxembourg, the Netherlands, the United Kingdom, and West Germany).

⁶⁸ Steel is a generic term used to describe a variety of iron-carbon alloys. Although steel grades are generally classified into the subcategories of carbon, stainless, tool, and other alloy, for purposes of this report two categories are used: carbon steel and specialty steel. "Specialty steel" refers to stainless and alloy tool steel, products which contain quantities of carbon, chromium, and other alloy elements in ratios significantly different from those in carbon steel.

⁶⁹ For a more comprehensive discussion of the history of the steel VRAs, see USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase I: Manufacturing*, publication 2222, Oct. 1989.

the President announced a Steel Liberalization Program that extended the VRAs through March 31, 1992. The USTR completed negotiations for the program in December 1989 with most of the countries that previously had VRAs.⁷⁰ The VRAs were allowed to expire in March 1992 without further extension.⁷¹

The VRA quotas were, for the most part, binding from their initiation in 1985 through 1987. From 1988 through 1992, the overall VRA quotas became nonbinding primarily because of the dollar's depreciation after 1985, the rise in demand for steel worldwide in the late 1980s, and the U.S. recession since 1991. Table 15 shows the extent to which aggregated VRA ceilings were filled between 1985 and March 1992, when the VRA expired. This table shows that the steel VRA went from completely binding in 1985 to the quotas being about one half filled at the end of the program in 1992.

As discussed above, the VRAs were not binding during 1991 for a number of reasons, such as weak demand by major U.S. steel-consuming industries, relatively stronger demand in foreign markets, and the weak U.S. dollar.⁷² In addition, improvements in the cost competitiveness of integrated U.S. producers and the increased U.S. market penetration by low-cost U.S. minimills also limited exports to the United States by foreign producers.⁷³ In general, nonbinding quotas do not have a direct effect on the price of imported steel. Therefore, elimination of the quotas in 1991 would not have caused a direct decline on the overall price of imported steel.

Previous studies on the steel VRAs have found that these particular quotas, when they were binding, imposed significant net-welfare costs to the U.S. economy.⁷⁴ Using a partial equilibrium approach, Tarr and Morkre measured a welfare loss of approximately \$800 million for the U.S. economy in 1983.⁷⁵ Similarly, using a partial equilibrium analysis, the USITC found that the net-welfare gains associated with removing the VRAs ranged from \$65 million to \$433

⁷⁰ South Africa was the only country with which the United States did not renew the VRA.

⁷¹ Since December 1992, the United States and 34 countries have been negotiating a Multilateral Steel Agreement that would address the elimination of tariffs, quantitative restrictions, and most subsidies for steel.

⁷² USITC, *Steel: Semiannual Monitoring Report*, publication 2558, Sept. 1992.

⁷³ See USITC, *U.S. Trade Shifts in Selected Commodity Areas: Annual Report for 1991*, publication 2517, June 1992.

⁷⁴ Other researchers have also examined the other aspects of the steel VRAs. For instance, Crandall examined the effects of the steel VRAs on U.S. labor costs, productivity, and product quality. See Robert W. Crandall, "The Effects of U.S. Trade Protection for Autos and Steel," *Brookings Papers on Economic Activity* (1987), 271-88.

⁷⁵ David G. Tarr and Morris E. Morkre, *Aggregate Costs to the United States of Tariffs and Quotas on Imports*, Bureau of Economics Staff Report, Federal Trade Commission, Washington, DC, 1984.

Table 15
Total exports to the United States of steel products covered by the VRAs, October 1984-March 1992

(In thousands of metric tons, except where indicated)

Time period	Actual exports	Final export ceiling	Percent of export ceiling filled
Oct. 1984-Dec. 1985	18,354	17,998	102.0
Jan. 1986-Dec. 1986	13,139	13,326	98.6
Jan. 1987-Dec. 1987	13,647	14,518	94.0
Jan. 1988-Dec. 1988	13,357	16,917	79.0
Jan. 1989-Sep. 1989	8,282	12,319	67.2
Oct. 1989-Dec. 1990	15,421	20,932	73.7
Jan. 1991-Mar. 1992 ¹	15,601	28,428	54.9

¹ Includes a small amount of trade not yet finalized by the exporting countries.

Source: U.S. Department of Commerce, Office of Agreements Compliance.

million between 1986 and 1988.⁷⁶ Finally, in an applied general equilibrium analysis, de Melo and Tarr found a welfare gain of \$860 million from lifting the VRA, a quota rent recapture of \$740 million, both in 1984 dollars, and a decline in steel industry employment after economywide effects are taken into account.⁷⁷

Although the VRAs did not have a direct effect on prices in 1991 that could be analyzed in a CGE analysis, it is possible to briefly address the indirect market effects of the VRAs on such factors as quality upgrading of steel imports and investment risk in the U.S. market.⁷⁸

During the period when the steel VRAs were binding, one of the results that was observed was the shift by foreign producers from low-valued products to high-valued products in their exports to the United States. This result is commonly recognized in

⁷⁶ USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase I: Manufacturing*, publication 2222, Oct. 1989.

⁷⁷ Jaime de Melo and David Tarr, "Welfare Costs of U.S. Quotas in Textiles, Steel and Autos," *Review of Economics and Statistics* (Aug. 1990), 489-97.

⁷⁸ For example, see Randi Boorstein and Robert Feenstra, "Quality Upgrading and its Welfare Cost in U.S. Steel Imports, 1969-74," in *International Trade and Trade Policy*, Elhanan Helpman and Assaf Razin, eds. (Boston: MIT Press, 1991).

economic theory. Briefly, when VRA quotas are binding, the typical result is a greater proportion of exports of higher valued products within each steel category subject to export restriction. Since the cost of using an export quota right is the same for each unit of export, regardless of the value of the export, the proportional price increase is less for the higher valued product than for the lower valued product. Thus, after the imposition of the VRA, consumers may purchase fewer units of the lower valued product for each unit of the higher valued product.

In previous investigations by the USITC, many steel producers and users, including some service centers, stated that the VRAs, although not binding, helped to stabilize the domestic market.⁷⁹ Basically, the VRAs, while nonbinding, limited potential price reductions by imposing an upper bound on imports that could be reached with a lower import price. To the extent that downward price movements were limited, holders of domestic steel inventory and owners of capital specific to the U.S. steel industry faced a smaller downside risk of unexpected losses. In effect, the presence of the quotas implicitly extended insurance to steel inventory and capital owners.

⁷⁹ See USITC, *The Western U.S. Steel Market: Analysis of Market Conditions and Assessment of the Effects of Voluntary Restraint Agreements on Steel-Producing and Steel-Consuming Industries*, publication 2165, Mar. 1989.

CHAPTER 4

Agriculture

Sugar

Historically, sugar programs have been aimed at supporting the incomes of sugar-cane farmers, sugar-cane millers, sugar-beet farmers, and sugar-beet processors by stabilizing the U.S. price of sugar at minimum levels. Producers of substitute sweeteners, in particular high fructose corn syrup (HFCS), also benefit from these programs. However, domestic refiners of cane sugar and downstream industries that produce sugar-containing products are adversely affected by domestic sugar policy because it raises the cost of their sugar inputs.

Table 16 presents employment and the value of U.S. production, imports, and exports for the sugar sector for 1989-91. Sugar accounted for the dominant share of U.S. consumption of sweeteners until 1985, when it was surpassed by corn sweeteners.⁸⁰ Sugar also lost market share to low-calorie sweeteners during the 1980s. During the 1991/92 marketing year, the United States accounted for approximately 6 percent of world production of sugar and for 7 percent of both world imports and consumption.⁸¹

*Current Operation of the U.S. Sugar Program*⁸²

The current price support program for sugar-cane and sugar-beet growers, sugar-cane millers, and sugar-beet processors consists of nonrecourse loans.

⁸⁰ See U.S. Department of Agriculture, *Sugar and Sweetener: Situation and Outlook Report*, Economic Research Service, June 1992, and Stephen Neff, *Welfare Implications of Removing U.S. Import Quotas on Sugar and Dairy Products*, unpublished Ph.D. dissertation, Stanford University, 1988.

⁸¹ Refined sugar is derived from sugar cane and sugar beets. In the United States, sugar cane is grown in Louisiana, Florida, Texas, and Hawaii whereas sugar beets are grown mainly in five regions, Minnesota-North Dakota, Michigan-Ohio, the Great Plains, the Northwest, and California.

⁸² For a more complete discussion of the history of U.S. sugar programs, see USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase II: Agricultural Products and Natural Resources*, publication 2314, Washington, DC, Sept. 1990, ch. 2, and U.S. Department of Agriculture, *Sugar: Background for 1985 Farm Legislation*, Economic Research Service, Sept. 1984. For a more complete discussion of the current U.S. sugar program, see USITC, *Industry & Trade Summary: Natural Sweeteners*, publication 2545, July 1992.

To receive nonrecourse loans, millers and processors must pay sugar-cane and sugar-beet growers support prices. The sugar is used as collateral for the loans. If processors elect to forfeit the sugar to the Commodity Credit Corporation (CCC), they are not liable for repayment of the loan (hence, "nonrecourse" loan).⁸³ The sugar program is operated to prevent the accumulation of sugar by the CCC, and since the 1984/1985 marketing year, no forfeitures of sugar have been made to the CCC. In addition, current legislation allows for domestic marketing allotments of the 1991-95 U.S. sugar crop to maintain the support price.⁸⁴

Tariff-rate quotas are currently used in order to make the market a more attractive alternative to loan forfeitures. The tariff-rate quota allows an allotted amount of sugar to enter the United States at a duty rate of 0.625 cents per pound. Any imports in excess of the allotment during the designated quota period are subject to a tariff of 16 cents per pound. During the current quota period, which runs from October 1, 1992, to September 30, 1994, the U.S. sugar quota is 2.5 million short tons, raw value.

The price of sugar is also supported by quotas on imports of sugar-containing products, which prevent imports of these products from disrupting the price-support programs for cane sugar and beet sugar. These quotas, which have been in effect since 1983, are on a first-come, first-serve basis.⁸⁵ The quotas apply to five broad categories of sugar-containing products: 1) blended syrups containing sugar, not in retail containers; 2) edible preparations containing over 65 percent sugar, not in retail containers; 3) sweetened cocoa powder; 4) flour mixes and doughs containing over 10 percent sugar, except doughs in retail

⁸³ Sugar-cane millers and sugar-beet processors agree to pay farmers support prices for sugar cane and sugar beets that are based on the loan rates at which millers and processors obtain financing from the CCC. Price support levels and loan rates vary by region. The current average loan rate is 18 cents per pound for refined cane sugar. The average loan rate for processed beet sugar was 22.85 cents for the 1991 crop and 22.83 cents for the 1992 crop.

⁸⁴ The current sugar program is covered by the Food, Agriculture, Conservation, and Trade Act of 1990.

⁸⁵ The current quotas were imposed by Presidential Proclamations No. 5071 of June 28, 1983 and No. 5294 of Jan. 28, 1985.

Table 16
Sugar sector: Summary data, 1989-91¹

(Million dollars, except where indicated)

Item	1989	1990	1991
Shipments:			
Raw cane sugar	1,419	1,276	1,345
Cane sugar refining	2,686	3,131	2,954
Beet sugar	2,708	2,111	2,306
Employment (workers):			
Raw cane sugar	6,300	6,100	6,200
Cane sugar refining	4,900	4,900	4,900
Beet sugar	8,000	7,600	7,600
Imports:²			
Raw cane sugar	654	858	723
Cane sugar refining	(2)	(2)	(2)
Beet sugar	(2)	(2)	(2)
Exports:³			
Raw cane sugar	263	293	306
Cane sugar refining	(3)	(3)	(3)
Beet sugar	(3)	(3)	(3)

¹ The three subsectors depicted in the table correspond to 4-digit SIC categories: raw cane sugar (2061), cane sugar refining (2062), and beet sugar (2063).

² The value for raw cane sugar includes imports of cane and beet sugar as well as their byproducts.

³ The value for raw cane sugar includes exports of cane and beet sugar as well as their byproducts.

Source: U.S. Department of Commerce.

containers; and 5) edible preparations containing over 10 percent sugar.

Economic Effects of Removing The U.S. Sugar Quotas

The USITC CGE model details two liberalized sectors, sugar processors and sugar-containing products; one upstream sector, sugar crops; one downstream sector, bakery products and cereal breakfast foods; and nine aggregate sectors representing the remainder of the U.S. economy. Removal of the sugar tariff-rate quotas, with all domestic policies remaining intact, would result in a large number of loan defaults by sugar processors. To avoid this outcome, the model simulates the joint removal of the U.S. sugar quotas and the elimination of CCC nonrecourse loans.

Previous studies, using partial equilibrium analyses, have estimated welfare effects associated with the sugar programs. Neff in 1988 and Hufbauer et al. in 1986, examine the welfare effects of removing the U.S. sugar quotas.⁸⁶ Neff, using average data for the period 1982-87, estimates a net economic welfare effect of \$594 million and Hufbauer et al. estimate a \$540 million net economic welfare effect, on average from 1977-84. The U.S. Department of Agriculture (USDA) found that the quotas imposed a

⁸⁶ Neff (1988), and Hufbauer, Berliner, and Elliott, *Trade Protection in the United States: 31 Case Studies* (Washington, DC: Institute for International Economics, 1986).

net welfare cost of \$725 million in 1983.⁸⁷ Schmitz, Allen, and Leu found a larger net welfare cost for 1983 of \$1.3 billion.⁸⁸ Sturgiss et al. found that, between 1982-88, the average annual net loss to the U.S. economy resulting from the quotas ranged from \$776 million to \$785 million.⁸⁹

The effects of both the U.S. tariff-rate quotas on sugar and the quotas on sugar-containing products are estimated using an equivalent ad valorem tariff, as described in chapter 1. Not all of the products in the model's sugar-containing product sector are covered by the quotas; therefore, an approximation of the tariff equivalent for the sugar-containing product sector was derived by multiplying the estimated tariff equivalent for sugar by the share of imports in this sector covered by the quotas.⁹⁰ Finally, the quotas on both sectors are

⁸⁷ U.S. Department of Agriculture, *Sugar: Background for 1985 Farm Legislation*, Agr. Info. Bull. No. 478, Sept. 1984.

⁸⁸ Andrew Schmitz, Roy Allen, and Gwo-Jium Mike Leu, *Alternative Agricultural and Food Policies and the 1985 Farm Bill*, Gordon C. Rausser and Kenneth R. Farrell, eds. (San Leandro, CA: Blaco Printers, 1984).

⁸⁹ Robert Sturgiss, Heather Field, and Linda Young, *1990 and U.S. Sugar Policy Reform*, Australian Bureau of Agricultural and Resource Economics, discussion paper 90-4, Apr. 1990.

⁹⁰ The 5 categories of sugar-containing products, which are listed in the text are contained in the following 9 broad categories (corresponding 4-digit SIC industries follow in parentheses):

condensed and evaporated milk (2023); salad dressing and sauces (2035); blended and prepared flour (2045); wet corn milling (2046); candy and confectionery products (2064); chocolate and cocoa products (2066); flavoring extracts and syrups (2087); roasted coffee (2095); food preparations, n.e.c. (2099).

removed simultaneously to prevent the market distortions that would arise from removing only one quota while leaving the other intact. In 1991, the sugar processor sector has an estimated tariff equivalent of 124.8 percent, and the sugar-containing product sector has a tariff equivalent estimated to be 10 percent.⁹¹

The overall effect of liberalizing the sugar sectors is a welfare gain to the U.S. economy of \$657 million. Contributing to the gain in economic welfare is the decline in prices in the sugar sector of 8.3 percent. Across the economy, net employment and output experience negligible declines. In addition, net imports increase by \$986 million and net exports decline by \$104 million.

Table 17 presents the domestic employment, output, and trade effects of quota liberalization. The sugar processor sector experiences a decline in employment of 1,876 full-time equivalent workers (jobs) or by 8 percent. Output in this sector also falls by 8 percent (\$690 million). However, the sugar-containing product sector only experiences a small decline in employment and output of one-tenth of 1 percent. This smaller decline is partially a result of lower input prices that the sugar-containing product sector experiences with the removal of the sugar quotas. The sugar crops sector, an upstream supplier to the sugar processor sector, also experiences a decline in employment and output of 8 percent. The one downstream sector, bakery products and cereal breakfast foods, benefits slightly from liberalization.

Imports into the sugar processor sector increase by \$769 million (or by 96 percent) with removal of the quotas. In addition, imports for sugar-containing products increase, but by a much smaller amount, \$138 million (or by 4.7 percent). The increase in these imports results mainly from a decline in the price of overall sugar-containing products. However, only 8 percent of the products in the sugar-containing products sector are covered by the quotas. In many cases, both quotas have diverted U.S. imports towards sugar-containing products not subject to the quotas. In addition, it is possible that liberalization would result

⁹⁰—Continued

These 9 categories comprise the sector of "sugar-containing products" in the USITC CGE model. Imports within the sugar-containing product sector that were covered by quotas amounted to approximately 8 percent of total imports for that sector.

⁹¹ The ad valorem tariff equivalent for raw cane sugar, 124.8 percent, was calculated by taking the difference between the U.S. price and the world price inclusive of transportation costs; this difference was then stated as a percentage of the world price. In 1991, the world price for sugar was 9.04 cents per pound and the U.S. price was 21.57 per pound. The average transportation charges from CBERA countries to the U.S. East Coast were 1.25 cents per pound. The sources for these data were USDA, *Sugar and Sweetener: Situation and Outlook Yearbook*, June 1992, and the U.S. Department of Commerce. The product of the quota premium for raw cane sugar, 124.8 percent, and the import coverage ratio, 8 percent, equals 10 percent.

in a decline of imports of sugar-containing products.⁹² However, because of a lack of industry detail, it is not possible to capture this potential result in the current USITC model.

Dairy

In the United States, dairy imports are restricted by quotas, and exports have consisted mainly of sales at below market prices or for food aid to developing countries. All major dairy-producing countries restrict the importation of dairy products, and most of them subsidize the production and export of dairy products as well. Consequently, only about 5 percent of world dairy production is traded internationally. Table 18 presents employment and the value of U.S. shipments, imports, and exports, by dairy manufacturing sector for 1989-91.

Regulation of the dairy industry evolved from legislation enacted in the 1930s, 40s, and 50s. In particular, the Agricultural Marketing Agreement Act of 1937 provided for Federal milk-marketing orders, the Agricultural Act of 1949 established the dairy price support program, and the Defense Production Act of 1950 established import quotas on most dairy products. In addition, there are tariffs on imports as well, but it is the dairy programs that play a major role in determining the prices and production of U.S. dairy products.⁹³

*Current Operation of the U.S. Dairy Programs*⁹⁴

The U.S. dairy quotas restrict imports on virtually all products derived from cow's milk. The quotas were put in place to prevent imports from interfering with the price support program for milk and products derived from milk. These quotas limit the importation

⁹² For further discussion on the effect of quotas on all sugar-containing products, see Cathy Jabara, "Effects of Sugar Policy on U.S. Imports of Processed Sugar-Containing Foods," *Agricultural Economics*, vol. 3 (1989), 131-46. In this paper, Jabara finds a positive relationship between the imports of sugar-containing products and the ratio of the U.S. price of sugar to the world price of sugar. This result suggests that when the U.S. price of sugar falls relative to the world price of sugar, imports of sugar-containing products would fall as well.

⁹³ For a detailed history of the U.S. dairy programs, see USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase II: Agricultural Products and Natural Resources*, publication 2314, Washington, DC, Sept. 1990, ch. 3.

⁹⁴ This section is based largely on Warren, F., *Industry Trade & Summary: Dairy Produce*, publication 2477 (AG-3), Washington, DC: USITC, Jan. 1992; Fallert, R., Blayney, D. and Miller, J., *Dairy: Background for 1990 Farm Legislation*, Economic Research Service, staff report AGES 9020, Washington, DC: USDA, Mar. 1990.

Table 17
Sugar: Economic effects of removing the import quotas, 1991

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
Liberalized sectors:								
Sugar processors	-1,876	-8.0	-690	-8.0	769	95.6	-19	-5.6
Sugar-containing products ..	-164	-0.1	-38	-0.1	138	4.7	6	0.1
Upstream sector:								
Sugar crops	-842	-8.0	-112	-8.0	(³)	-8.0	(³)	-8.0
Downstream sector:								
Bakery products and cereal breakfast foods	172	0.1	19	0.1	(³)	-0.2	(³)	0.1
Rest of the U.S. economy:								
Agriculture, forestry, and fisheries	-206	(⁴)	-25	(⁴)	(³)	(⁴)	-15	(⁴)
Mining	-47	(⁴)	-6	(⁴)	2	(⁴)	-2	(⁴)
Construction	-40	(⁴)	-3	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Nondurable manufacturing ..	302	(⁴)	75	(⁴)	2	(⁴)	9	(⁴)
Durable manufacturing	-376	(⁴)	-52	(⁴)	57	(⁴)	-40	(⁴)
Transportation, communi- cations, and utilities	-513	(⁴)	-70	(⁴)	8	(⁴)	-22	(⁴)
Wholesale and retail trade	-100	(⁴)	3	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Finance, insurance, and real estate	457	(⁴)	132	(⁴)	2	(⁴)	-2	(⁴)
Other services	2,720	(⁴)	177	(⁴)	10	(⁴)	-10	(⁴)

¹ Full-time equivalent jobs.

² In millions of dollars in base year prices.

³ Change less than 1 million dollars.

⁴ Change less than one-tenth of 1 percent.

⁵ Nontradeable sector.

Source: Estimated by the staff of the USITC.

of dairy products equal to a quantity of approximately 2 percent of the equivalent of U.S. milk production. In recent years, the U.S. dairy quotas have been substantially filled (nearly 99 percent).⁹⁵ Most of the dairy quotas are allocated on a country-by-country basis and are administered by the USDA through a licensing procedure. However, some quota products are not subject to license and are allowed to enter the United States on a first-come, first-serve basis.

Since milk is a perishable product and is expensive to transport in liquid form, the U.S. Government, through the CCC, supports the farm price of raw milk indirectly by purchasing butter, cheddar cheese, and nonfat dry milk from dairy processors at specified prices. The price of milk produced under sanitary conditions that qualify it for fluid consumption is regulated directly by the Federal Milk Marketing Order Program. This program regulates price of consumption grade milk. The minimum prices set by the marketing orders are based on the average price of raw milk in Minnesota and Wisconsin (the M-W price) which, in turn, is indirectly supported by CCC purchases of surplus dairy products. In general, prices for consumption grade milk used for manufactured

products are set at or near the M-W price, while prices for consumption grade milk destined for the fluid market are set higher by fixed differentials unique to each Federal order. Thus, the milk-marketing orders extend the support price of raw grade milk to all milk prices.

If the dairy quotas were eliminated, the CCC would substantially increase its purchases of dairy products to maintain the M-W price of raw milk. In essence, the M-W price would become the world price for raw milk, supported by U.S. Government purchases. Consequently, to effectively model the impact of the U.S. dairy quotas requires suspension of CCC purchases. In addition, this implies that the milk-marketing orders are also suspended so that the price of raw milk can move freely in the market.⁹⁶

Economic Effects of Removing the U.S. Dairy Quotas

The USITC CGE model focuses on the dairy farm sector, four dairy manufacturing sectors, and nine

⁹⁶ The milk-marketing orders are not explicitly modeled. It is assumed that they cease to regulate the prices that processors pay for raw milk.

⁹⁵ See Warren (1992).

Table 18
Dairy: Summary data, 1989-91.

(Million dollars, except where indicated)

Item	1989	1990	1991
Shipments:			
Butter	1,678	1,480	1,481
Cheese	11,862	13,606	12,890
Dry/condensed milk products	6,206	6,214	6,034
Cream ¹	18,110	19,092	17,858
Employment (workers):			
Butter	1,800	1,600	1,600
Cheese	32,500	34,900	34,100
Dry/condensed milk products	12,300	12,100	12,000
Cream ¹	72,200	69,600	68,300
Imports:			
Butter	3.9	3.8	1.7
Cheese	381.0	439.0	420.0
Dry/condensed milk products	345.0	327.0	274.0
Cream ¹	10.8	12.2	6.2
Exports:			
Butter	54.0	111.0	45.4
Cheese	24.8	38.7	36.4
Dry/condensed milk products	374.0	228.0	378.0
Cream ¹	29.2	31.1	42.6

¹ The data for this sector is for the entire fluid milk sector, which cream is a part.

Source: U.S. Department of Commerce.

aggregate sectors that constitute the remainder of the U.S. economy. Removal of the dairy quotas with all domestic policies remaining intact, would entail an impossible expansion of CCC purchases of dairy products. To avoid this outcome, the model simulates the joint removal of the U.S. dairy quotas and the elimination of CCC purchases of dairy products.⁹⁷

Much of the research on the U.S. dairy industry has focused on the economic effects of removing the dairy price support programs within the United States, leaving the trade barriers in place.⁹⁸ A second strand of research examines commercial policy issues in the dairy sector. Two examples are the works by Neff in 1988 and by Hufbauer et al. in 1986.⁹⁹ Both works

⁹⁷ This is modeled here as a reduction in government demand (by the amount of CCC purchases in 1991) in the dairy product sectors.

⁹⁸ This research includes LaFrance and de Gorter, H., "Regulation in a Dynamic Market: The U.S. Dairy Industry," *American Journal of Agricultural Economics* (Nov. 1985), 821-32; Masson and Eisenstat, "Welfare Impacts of Milk Orders and the Antitrust Immunities for Cooperatives," *American Journal of Agricultural Economics* (May 1980), 270-78; and Dahlgran, "Welfare Costs and Interregional Income Transfers Due to Regulation of Dairy Markets," *American Journal of Agricultural Economics* (May 1980), 288-96.

⁹⁹ Stephen Neff, *The Welfare Implications of Removing U.S. Import Quotas on Sugar and Dairy Products*, unpublished Ph.D. dissertation, Stanford University, 1988, and Hufbauer, Berliner, and Elliott, *Trade Protection in the United States: 31 Case Studies* (Washington, DC: Institute for International Economics, 1986).

employ a partial equilibrium framework. Neff, using average data for the period 1982-87, estimates a net economic welfare effect of \$2.7 billion and, Hufbauer et al. estimate a \$1.6 billion net economic welfare effect for 1983.

The USITC CGE model highlights four dairy manufacturing sectors: butter, cheese, dry/condensed milk products, and cream. Although these sectors are protected by quotas, a main beneficiary is the dairy farm sector, which produces raw milk and is upstream to the dairy manufacturing sectors.

The effects of the U.S. dairy quotas are estimated by means of an equivalent ad valorem tariff, as described in chapter 1. USDA collects both domestic and world price data for whole milk powder, butter, and cheese. These three price series serve as a basis for the estimates of the tariff equivalents of the U.S. dairy quotas used in the CGE model. The butter and cheese sectors have a straightforward application of the price-gap method because data exist for both domestic and world prices.¹⁰⁰ For the other two sectors, dry/condensed milk products and cream, the price gap for whole milk powder is used as a proxy because these sectors contain primarily milk and cream products, which have a high butterfat content, and because world price data for these sectors are not available. The 1991 tariff equivalents are: butter, 26.9

¹⁰⁰ The world price data USDA collects in the cheese sector are prices for cheddar cheese. Consequently, a tariff equivalent for cheddar cheese is used as a proxy for the cheese sector, although there are many different types of cheeses.

percent; cheese, 35.4 percent; dry/condensed milk products, 60.3 percent; and cream, 60.3 percent.¹⁰¹

The welfare effects of quota liberalization can be affected by the assumptions concerning the rents generated by quotas. The quotas for butter and cheese require USDA licenses that are allocated to qualified domestic importers. This would lead one to believe that the quota rents accrue to these firms. However, recent research on the cheese quotas by Hornig et al. indicates that the export side of the cheese market is highly concentrated resulting in market power for both the importers and exporters. They estimate that in 1980 the quotas generated rents of about \$41 million for importers and \$52 million for exporters. Based on this work, the quota rents are split on a 50/50 basis between domestic importers and foreign exporters for both the butter and cheese sectors.¹⁰² The quotas for the dry/condensed milk product and cream sectors are administered by the U.S. Customs service on a first-come, first-serve basis. Consequently, it is assumed that foreign exporters capture all of the quota rents in these two sectors because the import side is unconcentrated and the foreign exporters benefit from higher prices for their products.

The overall effect of liberalizing the dairy quotas is a welfare gain of \$847 million for the U.S. economy. Contributing to the gain in economic welfare is the decline in prices in the dairy sector. The largest price decline is in the cheese sector (0.9 percent), which also has the greatest value of imports as well. Across the economy, net employment and output experience negligible declines. In addition, net imports and exports increase by \$182 million and \$70 million, respectively.

Table 19 presents the employment, output, and trade effects of unrestrained imports in the U.S. dairy sector. The dairy farm sector experiences a seemingly large decline in output (\$365 million) and employment (1,245 jobs), but in relative terms these declines are each less than 2 percent. Employment and output fall in all of the dairy manufacturing sectors, with the butter sector experiencing the largest relative decline of nearly 14 percent followed by the dry/condensed milk product sector with a decrease of 5.4 percent in both employment and output. In all liberalized sectors, imports increase and exports decrease with the cheese sector experiencing the largest absolute increase in

¹⁰¹ In 1991, the average world price (including transportation costs to the United States) for butter was 0.78 \$/lb., for cheddar cheese 0.92 \$/lb, and for dry whole milk 0.71 \$/lb. In 1991, the average U.S. price for butter was 0.99 \$/lb, for cheddar cheese 1.24 \$/lb, and dry whole milk 1.14 \$/lb. These pricing data are from *Dairy Market Statistics* and *World Dairy Situation* published by USDA.

¹⁰² See Hornig, Boisvert, and Blandford, "Explaining the Distribution of Quota Rents From U.S. Cheese Imports," *Australian Journal of Agricultural Economics* (Apr. 1990), 1-20; and Hornig, Boisvert, and Blandford, "Quota Rents and Subsidies: The Case of U.S. Cheese Import Quotas," *European Review of Agricultural Economics* (1990), 421-34.

imports of \$217 million. Both the cheese and dry/condensed milk product sectors experience a relative increase in imports of over 50 percent.

Meat

The meat products group in the United States consists of two major sectors: red meat and poultry. This chapter provides an analysis of the effects of import restraints on red meat.¹⁰³ In 1991, U.S. imports of red meat products totaled \$3 billion and accounted for approximately 5 percent of U.S. shipments. During the same year, the United States exported red meat products valued at \$4.3 billion. Table 20 presents employment and the value of U.S. shipments, imports, and exports for the red meat industry for 1989-91.

*Current Operation of the U.S. Meat Program*¹⁰⁴

The Meat Import Act of 1979 and Section 204 of the Agricultural Act of 1956 establish the U.S. program of import restrictions on red meat. The Meat Import Act requires the President to impose limits on meat imports if they appear likely to exceed a specified level in a given year. The "trigger" level for restraints is adjusted annually to allow for changing levels of U.S. production and other market conditions. Section 204 authorizes the President to negotiate voluntary restraint agreements (VRAs) with foreign governments for red meat and other agricultural products. Voluntary restraints can substitute for mandatory ones. In nearly every year in which imports have been expected to exceed the trigger level VRAs, the President has successfully negotiated agreements with major meat exporters.

Economic Effects of Removing the VRAs On Meat

In 1991, the VRAs applied to meat imported from Australia and New Zealand. These imports consist of products that compete directly with the U.S. meat-packing sector, one of the two SIC industries that constitute the red meat industry and a sector in the USITC model. Consequently, the effects are estimated on the basis of the full effects of trade liberalization within the meat-packing sector. The other component of the red meat industry, prepared meats (including sausage), is considered downstream to the meat-packing sector. The modeling exercise here

¹⁰³ The red meat sector includes two 4-digit SIC industries: 2011, Meat Packing Plants, and 2013, Sausages and Other Prepared Meats.

¹⁰⁴ For a further discussion of the U.S. meat import restrictions, see USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase II: Agricultural Products and Natural Resources*, publication 2314, Sept. 1990, ch. 6.

Table 19
Dairy: Economic effects of removing the import quotas, 1991

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
Liberalized sectors:								
Butter	-357	-13.8	-365	-13.8	(³)	12.0	-5	-13.8
Cheese	-505	-1.9	-260	-1.9	217	57.5	-1	-1.6
Dry/condensed milk products	-886	-5.4	-348	-5.4	20	63.7	-19	-4.7
Cream	-447	-0.5	-136	-0.5	3	38.1	(³)	-0.5
Upstream sector:								
Dairy farms	-1,245	-1.8	-365	-1.8	(³)	-1.8	(⁵)	(⁵)
Rest of the U.S. economy:								
Agriculture, forestry, and fisheries	-771	-0.1	94	(⁴)	-8	-0.1	1	(⁴)
Mining	-43	(⁴)	(³)	(⁴)	-3	(⁴)	1	(⁴)
Construction	-67	(⁴)	-2	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Nondurable manufacturing ..	-757	(⁴)	-98	(⁴)	-26	(⁴)	(³)	(⁴)
Durable manufacturing	882	(⁴)	153	(⁴)	-12	(⁴)	46	(⁴)
Transportation, communications, and utilities	168	(⁴)	44	(⁴)	-7	(⁴)	15	(⁴)
Wholesale and retail trade	-732	(⁴)	-23	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Finance, insurance, and real estate	412	(⁴)	167	(⁴)	(³)	(⁴)	4	(⁴)
Other services	2,787	(⁴)	209	(⁴)	-2	(⁴)	18	(⁴)

¹ Full-time equivalent jobs.

² In millions of dollars in base year prices.

³ Change less than 1 million dollars.

⁴ Change less than one-tenth of 1 percent.

⁵ Nontradeable sector.

Source: Estimated by the staff of the USITC.

Table 20
Red meat industry: Summary data, 1989-91

(Million dollars, except where indicated)

Item	1989	1990	1991
Shipments	64,058	68,765	66,963
Employment (<i>workers</i>)	199,000	200,000	204,000
Imports	2,752	3,127	3,047
Exports	3,974	4,245	4,298

Source: U.S. Department of Commerce.

highlights these two sectors, two upstream sectors (meat animal and feedgrains), two additional downstream sectors (leather and restaurants), and the nine sectors representing the rest of the U.S. economy.

The tariff equivalent of the VRA on red meat (see chapter 1) is estimated as the difference between the 1991 price of New Zealand cow beef (plus transportation costs to the United States) and the U.S. price of cow beef.¹⁰⁵ This price difference is 47.4 percent. This difference between the price New Zealand cow beef and U.S. cow beef is used as a basis to estimate the effect of the VRAs on the price of red meat in the United States. First, this percentage difference is multiplied by the share of all imported beef subject to the restraint, and then it is reduced further by the share of U.S. beef production that the U.S. Meat Import Act is designed to protect. These adjustments result in an equivalent tariff rate of 6.5 percent for the meat-packing sector as a whole.¹⁰⁶

The overall effect of removing the meat VRAs is a welfare gain of \$177 million for the U.S. economy.¹⁰⁷ Contributing to this gain in economic welfare is the decline in prices in the meat-packing sector of 0.2 percent. Across the economy, net employment gains negligibly, whereas net output experiences a negligible decline. In addition, net imports and exports increase by \$269 million and \$84 million, respectively.

Table 21 presents the employment, output, and trade effects of unrestrained imports in the meat-packing sector. The largest impact of this action is on the imports in the meat-packing sector. Imports increase by \$340 million, or by 12.6 percent. Employment, output, and exports decline by much smaller amounts, 0.6 percent. Of the upstream sectors, meat animal is adversely affected the most, with declines of 0.4 to 0.5 percent. The effects in the feedgrain sector is negligible. The downstream sectors generally benefit from liberalization with restaurants experiencing the largest absolute gains with an increase in employment of 440 jobs and a rise in output of \$31 million.

¹⁰⁵ The New Zealand price of cow beef is used as a world price for cow beef because they are an important world producer of beef and their internal market is unencumbered with barriers.

¹⁰⁶ The pricing data for New Zealand are from Canadian International Trade Tribunal, "PSE for Beef in Canada: An Examination of Methods," Aug. 1993. Specifically, the price of New Zealand cow beef was \$1,535 per ton, including transportation costs to the United States. The pricing data for the United States are from various issues of *Livestock and Poultry Situation and Outlook*, published by USDA. In 1991, the price of cow beef in the United States was \$2,262 per ton. The percentage difference between these two prices was then multiplied by 0.86 (the share of imports covered by the VRAs and then by 0.16 (the share of U.S. production the Meat Import Act is designed to protect).

¹⁰⁷ Hufbauer et al. (1986) estimated the economic welfare impact of the Meat Import Act in 1983 to be \$280 million.

Peanuts

Most of the U.S. peanut crop is consumed as edible nuts and as peanut butter, candy, and cookies. Most of the foreign peanut crop, however, is crushed for food oil and animal feed. Edible nuts command a higher price than crushed nuts. While peanut oil and peanut meal face strong competition from products derived from soybeans, cottonseeds, and sunflowerseeds, they are the world's third most important oilseed behind soybeans and cottonseeds.

Three major peanut-producing regions of the United States provide 98 percent of U.S. peanut production: the Georgia-Florida-Alabama-South Carolina (Southeast) region, the Texas-Oklahoma (Southwest) region, and the Virginia-North Carolina (V-C) region. The Southeast region dominates, with about 65 percent of U.S. production. Three main types of peanuts are grown in the United States: Runners (a medium size kernel), Virginia (a large kernel), and Spanish (a small kernel). The Southeast region grows mostly Runners. The Southwest region grows two-thirds Spanish and one-third Runners. The V-C region grows mainly Virginia peanuts.¹⁰⁸ Runners have typically accounted for about 75 to 80 percent of peanuts used in domestic edible products in recent years. Table 22 presents U.S. production, imports, and exports for the peanut sector for crop years 1989/90-91/92.

*Current Operation of the U.S. Peanut Program*¹⁰⁹

The United States has had programs designed to increase or stabilize domestic peanut prices since 1934. The most important features of the current peanut program are the national poundage quota and support price for edible peanuts, the market for "additional" peanuts, and a severely limited quota on imports of peanuts. The support price for edible peanuts applies only to a grower's poundage quota, which can be either sold directly into the edible market or placed under loan with the CCC. "Additional" peanuts (or nonquota peanuts) can be sold only in the export or domestic crush market, or placed under loan with the area growers' association at a support price well below the

¹⁰⁸ A fourth type, the Valencia, is grown primarily in New Mexico.

¹⁰⁹ This discussion is based largely on James D. Schaub and Bruce Wendland, *Peanuts: Background for 1990 Farm Legislation*, Economic Research Service, staff report AGES 89-61, USDA, Nov. 1989, and Randal R. Rucker and Walter N. Thurman, "The Economic Effects of Supply Controls: The Simple Analytics of the U.S. Peanut Program," *Journal of Law and Economics*, XXXIII (Oct. 1990). For more detail about the history of the program, see USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase II: Agricultural Products and Natural Resources*, publication 2314, Sept. 1990, ch. 4.

Table 21
Meat: Economic effects of removing the VRAs, 1991

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
Liberalized sector:								
Meat packing	-928	-0.6	-285	-0.6	340	12.6	-25	-0.6
Upstream sectors:								
Meat animal	-709	-0.4	-259	-0.4	-6	-0.5	-1	-0.4
Feedgrains	-55	-0.1	-24	-0.1	(³)	-0.1	(³)	(⁴)
Downstream sectors:								
Prepared meats	33	0.1	13	0.1	-1	-0.2	(³)	0.1
Leather	9	0.1	2	0.1	-1	-0.2	1	0.1
Restaurants	440	(⁴)	31	(⁴)	-3	(⁴)	9	(⁴)
Rest of the U.S. economy:								
Agriculture, forestry, and fisheries	78	(⁴)	10	(⁴)	-1	(⁴)	11	0.1
Mining	20	(⁴)	7	(⁴)	-1	(⁴)	2	(⁴)
Construction	4	(⁴)	4	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Nondurable manufacturing ..	19	(⁴)	24	(⁴)	-16	(⁴)	11	(⁴)
Durable manufacturing	753	(⁴)	124	(⁴)	-29	(⁴)	46	(⁴)
Transportation, communications, and utilities	186	(⁴)	36	(⁴)	-8	(⁴)	16	(⁴)
Wholesale and retail trade	-42	(⁴)	8	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Finance, insurance, and real estate	-77	(⁴)	17	(⁴)	-1	(⁴)	3	(⁴)
Other services	319	(⁴)	37	(⁴)	-4	(⁴)	11	(⁴)

¹ Full-time equivalent jobs.

² In millions of dollars in base year prices.

³ Change less than 1 million dollars.

⁴ Change less than one-tenth of 1 percent.

⁵ Nontradeable sector.

Source: Estimated by the staff of the USITC.

Table 22
Peanuts (farmers' stock basis¹): Summary data, crop years 1989/90-91/92
(In million lbs., in-shell basis, except where indicated)

Item	1989/90	1990/91	1991/92
Production (million dollars)	1,117	1,257	1,392
Production	3,990	3,603	4,927
Imports ²	2	27	2
Exports	989	652	997

¹ The term "farmers' stock peanuts" refers to picked and threshed peanuts that have not been shelled, crushed, cleaned, or otherwise changed (except for the removal of foreign material, loose shelled kernels, and excess moisture) from the form in which they are customarily marketed by producers.

² Excludes imports of peanut butter and peanut paste.

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

edible support price. Since 1953, imports have been limited to 1.7 million pounds (shelled basis), about one-tenth of 1 percent of domestic edible consumption, to support high domestic prices.¹¹⁰

There is some leakage of "additional" peanuts into the domestic edible market. Growers' associations can sell additionals at the domestic edible support price (plus a small premium) after receiving the peanuts at the much lower additional support price. Profits from sales of additionals are offset by losses on association sales in the crush market, within the regional association first, and then across associations.¹¹¹ The profits are distributed to individual growers in proportion to their placement of additionals into the association pools. While the link between these profits received by individual growers and their own placement of additionals in association pools is somewhat uncertain, there is nevertheless an incentive for diverting peanuts from the export market to association pools.¹¹²

The national poundage quota is set by the USDA equal to the estimated U.S. demand for peanuts for all end uses. The basic quota was 2.9 billion pounds in 1989/90, 3.1 billion pounds in 1990/91, and 3.1 billion pounds in 1991/92. Farm level quotas are set on the basis of allotted acreage and historical yields for each farm. The price support level for quota peanuts was 30.79 cents per pound in 1989/90, 31.57 cents per pound in 1990/91, and 32.14 cents per pound in 1991/92. The price support level for nonquota additional peanuts was set at 7.5 cents per pound in all 3 years.

Economic Effects of Removing the U.S. Peanut Import Quota

Roughly 20 percent of the U.S. peanut crop is currently exported at world prices, with a premium reflecting the quality of the delivered U.S. product, and the United States would likely continue to export a portion of its crop in the absence of the current import quota and price supports. The current import quota holds imports to less than 0.05 percent of U.S.

¹¹⁰ In addition to the quota, there are small duties on imports of peanuts and peanut products. Additional peanuts that have been exported can be re-entered only at a price substantially in excess of the edible support price.

¹¹¹ In crop year 1991/92, the national poundage quota exceeded domestic edible demand and there was a large crop, resulting in large losses on sales of both edible and additional peanuts in the crush market. Consequently there were no profits to be distributed by the associations in 1992 (with the exception of New Mexico growers, who have a legislated exemption from cross-association offsets of losses).

¹¹² Rucker and Thurman argue that the incentive to divert edible peanuts from the export market to the crush market leads to a partial dissipation of producer rents and to an additional social welfare loss, but to no change in total U.S. production. For a full discussion, see Rucker and Thurman (1990).

production. The presence of the import quota is necessary for the price support program to work without large costs to the U.S. Treasury.

The estimated tariff equivalents (see chapter 1) for peanuts and the U.S. and world prices for peanuts are reported in table 23. Most peanuts sold in world trade are shelled because of economies of scale in shipping and world prices are specified on a shelled basis. The U.S. support price is specified in terms of farmers' stock (in-shell). Comparison of the in-shell support price with the shelled world price requires the construction of a shelled support price or the construction of an in-shell world price. The prices presented in table 23 reflect these constructions when appropriate.¹¹³

A partial equilibrium model is used to evaluate the welfare effects of removing the U.S. import quota on peanuts because the peanut sector is too small to be identified in the USITC model.¹¹⁴ The economic welfare effects of removing the peanut import quota are shown in table 24. The gain to consumers of paying the world price of peanuts consists of two parts: (1) the lower price paid for peanuts on the current level of consumption—the transfer from producers, and (2) the value in excess of the world price to consumers of the additional peanuts they would consume at the world price but not at the higher domestic support price—the deadweight loss recovered.¹¹⁵ To illustrate (1), consider that in crop year 1991/92 domestic consumption of peanuts for food uses was reported by USDA to be 2,207 million pounds (farmers' stock basis). Multiplying this consumption by the 15.28 cents per pound tariff equivalent yields \$337 million in consumer savings. To illustrate (2), it is estimated that an additional 209 million pounds of peanuts would be consumed at the lower price than at the higher price. The value to consumers of this additional consumption is estimated to be \$16 million. The producer loss is the difference between the support price and the world price times the current sales for food use at the support price. This is identical to part (1) of the consumer savings—\$337 million.¹¹⁶ No downstream effects are estimated because USDA does not have data on the retail value of peanut products or on employment in the peanut-processing industry.

¹¹³ See appendix F for details on the tariff equivalent calculated for peanuts.

¹¹⁴ The model is illustrated in appendix F.

¹¹⁵ The gain to consumers of paying the world price of peanuts is measured by the change in what economists call consumer surplus. Consumer surplus is the difference between what consumers would be willing to pay for a product and the price they actually pay. See appendix F for illustration of this concept. For an intermediate level discussion of consumer surplus, see Jack Hirshleifer, *Price Theory and Applications*, 3rd ed. (Englewood Cliffs, NJ: Prentice Hall, 1984). For a more advanced discussion, see Hal Varian, *Microeconomic Analysis*, (New York: W.W. Norton and Company, 1978).

¹¹⁶ See appendix F for more details on this analysis.

Table 23
Peanuts: Prices and tariff equivalents, crop year 1991/92¹

	Price		Tariff equivalent	
	World	U.S.	Specific	Ad valorem
		Cents per lb.		Percent
Shelled	35.54	58.70	23.16	65
In-shell	16.86	32.14	15.28	91

¹ Based on price of U.S. peanuts in Rotterdam and U.S. support price for edible peanuts. See appendix F for details.

Source: Computed by USITC staff. Rotterdam price data provided by Stanley Fletcher, University of Georgia, Georgia Experiment Station, Griffin, GA., whose source is the *Public Ledger*, London, United Kingdom. U.S. support price from U.S. Department of Agriculture, Agricultural Stabilization and Conservation Service.

Table 24
Peanuts: Economic welfare effects of removing the import quota, crop year 1991/92
(Million dollars)

Item	1991/92
Consumer benefit:	
Transfer from producers	337
Deadweight loss recovered	16
Total consumer benefit	353
Producer loss	337

Source: Estimated by the staff of the U.S. International Trade Commission.

Cotton

Since the first half of the nineteenth century, cotton has been one of the most important agricultural commodities produced by the United States. It is presently the fourth largest U.S. field crop in value terms, behind wheat, corn, and soybeans.¹¹⁷ Recently, the United States has accounted for nearly 20 percent of the world's total output of cotton. Table 25 presents summary data for the cotton sector on a crop year basis by quantity.

Raising and trading cotton have been matters of political concern since before the Civil War, but in the past fifty years the U.S. Government has played a particularly active role in the cotton market. As part of the general system of agriculture income support, the Federal Government has supported cotton prices or revenues by deficiency payments, acreage adjustments, and import quotas.

¹¹⁷ USDA, *Agricultural Outlook*, Apr. 1993.

Current Operation of the U.S. Cotton Program¹¹⁸

The Food Security Act of 1985 established current cotton policy. The major objective of the Act, in terms of cotton, was to make the commodity competitive in world markets. The major new policy tool in the Act is the marketing loan. When the world price is below a certain level, the Secretary of Agriculture must institute a marketing loan plan, which may either reduce the nonrecourse loan rate paid by producers by up to 20 percent or adjust the repayment rate

¹¹⁸ This section draws on Harold Stults et al., *Cotton: Background for 1990 Farm Legislation*, Economic Research Service, U.S. Department of Agriculture, 1990. For a detailed history of the U.S. cotton program see USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase II: Agricultural Products and Natural Resources*, publication 2314, Washington, DC, Sept. 1990, ch. 5.

Table 25
Raw Cotton: Summary data, crop years beginning August 1, 1990/91-92/93
(In 1,000s of 480 pound bales)

Item	1990/91	1991/92	1992/93
Production	15,505	17,614	16,220
Imports	4	13	2
Exports	7,793	6,646	6,200

Source: U.S. Department of Agriculture, Foreign Agricultural Service, *World Cotton Situation*, circular series FC9-92, Sept. 1992, and *World Agricultural Supply and Demand Estimate*, Aug. 11, 1993.

periodically to reflect the adjusted world price. As a result, a sufficiently large marketing loan adjustment would cause the price of U.S. cotton to fall to the world price in export markets.

The Food, Agriculture, Conservation, and Trade Act of 1990 contained new procedures designed to enhance the price competitiveness of upland cotton in the world market. One of its provisions, in effect since August 1, 1991, requires the issuance of marketing certificates (or cash, as the practice has often been) to domestic users and exporters on certain sales.¹¹⁹ Other provisions of the Act provide for the establishment of a special import quota if the price of U.S. cotton delivered in Northern Europe exceeds that of the cheapest five growths by more than 1.25 cents per pound for a period of 10 consecutive weeks. According to USDA, this quota has never been implemented. The discretionary authority of the Secretary of Agriculture to adjust the loan rate, combined with the marketing certificate provisions mentioned above, have evidently precluded the necessity of using this provision.

¹¹⁹ These sales must be made during the week following a consecutive 4-week period in which the lowest priced U.S. growth of cotton quoted for delivery in Northern Europe (the U.S. price) exceeds the five lowest priced growths of cotton quoted for delivery in Northern Europe by more than 1.25 cents per pound. Hence, the payment rate is based on the amount that the U.S. price exceeds the Northern Europe index price by more than 1.25 cents per pound. Note that this payment is made to purchasers of U.S. cotton, not the growers.

From 1979 to 1988, raw cotton imports averaged 25,500 bales per year. However, during the 1989-92 period, imports did not exceed 13,000 bales per year. At this time, world prices rose to approximately the level of U.S. prices and imported cotton became less competitive. There is no evidence that quotas have actually been binding for any country in the past several years. For example, in the 1990/91 quota year, the quota was less than 6 percent filled from all countries for all categories of cotton, except for one type of cotton imported from Mexico, which was filled at 48.8 percent.

Economic Effects of Removing the U.S. Cotton Quotas

The estimated tariff equivalent of import quotas on cotton for the year 1991 is zero. This estimate for the tariff equivalent is consistent with the fact that quotas have not even closely approached being filled in recent years. Given the current conditions in the world cotton market coupled with the continued U.S. Government support of the domestic cotton industry, there is no reason to believe that the competitiveness of U.S. produced cotton would be affected, that imports or import prices would change, or that domestic shipments and prices would change by liberalization of the U.S. cotton quotas.

CHAPTER 5

Services

Services are a large but imperfectly measured fraction of international trade. According to the General Agreement on Tariffs and Trade (GATT) Secretariat, trade in services, accounting for 19 percent of all international trade, grew at an average annual rate of 7.5 percent from 1980 to 1990, compared with a growth rate of 5.5 percent for merchandise trade.¹²⁰ However, there are no consistent data on trade in services, because of the nature of services and the difficulty of observing cross-border flows of services.

Since the production or provision of services almost always requires an interaction, however remote or brief, between the provider and the consumer, the international trade in services is almost never observed at the border. Therefore, a barrier to international trade in services will be either an indirect barrier to the international passage of some component of the service (for example, special visa requirements for service providers) or an internal bar to the provision of a service by foreign nationals. A recent U.S. International Trade Commission (USITC) study of import restraints on services found no tariff barriers and virtually no import restraints on services of any kind.¹²¹

The U.S. market is generally open to trade in services. While foreign providers of some services do face constraints on operations in the United States, most of the barriers that foreign service providers must adhere to are the same domestic regulatory systems faced by U.S. providers; this "national treatment" of regulation is not considered a barrier to trade. Other requirements that are intended to bring foreign service providers specifically under a domestic regulatory framework are also considered an extension of national treatment of regulation. For example, requirements that foreign financial firms maintain assets in the United States if they want to operate in the United States.

Except for the restrictions on the foreign provision of transportation services in the United States (air and maritime transport), there are no significant discriminatory restrictions to the import of services that would have a clear impact on foreign participation in the U.S. market, and significant consequences for the U.S. economy.

¹²⁰ GATT Secretariat, *International Trade 1990-1991*, vol. 2 (1991).

¹²¹ USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase III: Services*, publication 2422, Sept. 1991.

Maritime Transport

The United States protects U.S. vessels from import competition in the U.S. domestic maritime market by the Merchant Marine Act of 1920, commonly referred to as the Jones Act, and in foreign trade mainly through a collection of preference cargo requirements.¹²² In addition, there are numerous other restrictions that apply to (1) the foreign ownership of U.S. registered ships; (2) the citizenship of U.S. crews on U.S.-flag ships; and (3) dredging, towing, or salvaging operations in the United States by foreign vessels. With the exception of the Jones Act, most of the restrictions listed above are too complex to quantify; therefore, this analysis provides a quantitative assessment only of the economic costs of Jones Act restrictions on domestic shipping.

*Current Operation of the Jones Act*¹²³

The current cabotage prohibition on foreign vessels is covered in section 27 of the Merchant Marine Act of 1920. It states that no merchandise transported by water between U.S. ports is to be carried "in any other vessel than a vessel built in and documented under the laws of the United States and owned by persons who are citizens of the United States."¹²⁴ Therefore, the act effectively reserves U.S. maritime cabotage for ships that are registered and built in the United States and that are owned and crewed, predominantly, by U.S. citizens. In addition, ships operating in trades that are protected by the Jones Act are prohibited from

¹²² In addition to the Jones Act, there are two other statutes that reserve transport of certain types of U.S. domestic cargo to U.S.-flag vessels. The Export Administration Act, 50 U.S.C., app., 2406(d), prohibits the export of Alaskan oil and, in effect, reserves this cargo for U.S.-flag vessels. In addition, section 4 of the Outercontinental Shelf Lands Act of Aug. 7, 1953, 43 U.S.C. 1333 and 1346 reserves the supply of offshore drill rigs and other exploration activities to U.S.-flag vessels.

¹²³ This section is based largely on Lawrence J. White, *International Trade in Ocean Shipping Services: The United States and the World*, (Cambridge, MA: An American Enterprise Institute/Ballinger Publication, 1988). For a more detailed discussion of the history of the Jones Act, see USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase III: Services*, publication 2422, Sept. 1991.

¹²⁴ 46 U.S.C. 883.

receiving operating and construction subsidies that other U.S.-flag ships may receive.¹²⁵

In value terms, cargo trade covered by the Jones Act in 1990, which includes oceanborne, lakewise, and inland shipping, amounted to approximately \$6.4 billion. Of this amount, oceanborne cargo accounted for about 47 percent of the value of total shipments (see table 26). The Jones Act also prevents foreign cruise vessels from transporting passengers between U.S. ports and restricts foreign access to U.S. river and canal traffic. However, the effects of the Jones Act on the passenger market and on river, canal, and lakewise traffic is not assessed in this analysis.

The dominant share of Jones Act cargo consists of liquid-bulk shipments of petroleum and petroleum-based products. By law, Alaska North Slope oil is effectively restricted to Jones Act trade. It cannot be exported, and it cannot be transported by foreign ships to domestic markets.¹²⁶ As a result of this restriction, petroleum and petroleum products account for approximately 90 percent of the volume, in ton-miles, of oceanborne freight carried by Jones-Act carriers.

¹²⁵ Numerous exemptions to the Jones Act exist. In terms of the volume of cargo affected, the largest general exemption applies to merchandise that is transported between the U.S. Virgin Islands and other U.S. ports. This cargo may be carried by foreign-flag carriers. Another general exemption applies to foreign-built U.S.-flag ships. These foreign-built vessels are allowed to carry cargo between Guam, other U.S. Pacific possessions, and U.S. ports. In addition, under a wide variety of circumstances, individual waivers to the Act are also granted to foreign and U.S. vessels that are not protected by the Act.

¹²⁶ These restrictions are found in the Export Administration Act and the Trans-Alaska Authorization Act of 1973.

Economic Effects of Removing the Jones Act Restrictions

The USITC CGE model divides the U.S. economy into 15 sectors in addition to the 9 aggregate sectors that account for the rest of the U.S. economy. The highlighted sectors include the cabotage and water transportation sectors, which are directly affected by the Jones Act, and those sectors that have significant upstream or downstream linkages to cabotage services or to petroleum and refined petroleum products, as well as to other transportation sectors.

Only a limited number of studies have attempted to assess the economic costs of the Jones Act. The Congressional Budget Office found that the cost to the U.S. economy resulting from the Jones Act equaled \$1.3 billion in 1983.¹²⁷ White estimated that the Jones Act imposed an additional \$2 billion in costs in 1984.¹²⁸ Finally, using a partial equilibrium analysis, the USITC found that the cost to the U.S. economy in 1989 ranged from \$3.6 billion to \$9.8 billion.¹²⁹

The effects of the Jones Act on cabotage services are estimated using an equivalent ad valorem tariff as discussed in chapter 1. The tariff-equivalent of this restraint is the output-weighted average price-gap between the U.S. and world prices for shipping services for the two main types of cargo transported: "wet-cargo", which consists mostly of petroleum bulk cargos, and "dry-cargo", which consists of liner and

¹²⁷ Congressional Budget Office, *U.S. Shipping and Shipbuilding Trends and Policy Choices* (Aug. 1984).

¹²⁸ Lawrence J. White, *International Trade in Ocean Shipping Services: The United States and the World* (Cambridge, MA, American Enterprise Institute/Ballinger Publication, 1988).

¹²⁹ USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase III: Services*, publication 2422, Sept. 1991.

Table 26
U.S. domestic waterborne-cargo sector: Total revenue and employment, by type, 1989-91

Item	1989	1990	1991
Revenue (million dollars):			
Oceanborne	3,232	3,008	(1)
Lakewise	530	576	(1)
Inland	2,729	2,843	(1)
Total	6,491	6,427	(1)
Employment (workers):			
Oceanborne	10,916	11,278	11,905
Lakewise	2,425	2,411	2,272
Inland	14,337	15,695	15,440
Total	27,678	29,384	29,617

¹ Not available.

Source: U.S. Department of Commerce, and U.S. Department of Labor, Bureau of Labor Statistics.

non-liquid bulk cargos.¹³⁰ Because of the Gulf War, 1991 tanker freight rates were artificially high, and after the War, shipping rates gradually "returned to more normal levels."¹³¹ Consequently, pricing data for 1992 are used because they are more representative estimates of the price difference between U.S. and world shipping rates. The tariff equivalent estimated for this analysis is 133 percent.¹³²

The economywide effect of removing the Jones Act is an economic welfare gain to the U.S. economy of approximately \$3.1 billion. This figure can also be interpreted as the annual reduction in real national income imposed by the Jones Act. A primary reason for the large gain in welfare is a decline in the price of shipping services formerly prohibited by the Jones Act of approximately 57 percent. In addition, prices fall in the rest of the water sector by 4 percent. Across the economy, liberalization results in a negligible gain in both employment and output. In addition, net imports increase by \$3.8 billion and net exports increase by \$1.8 billion.

Table 27 presents the domestic employment, output, and trade effects of opening the cabotage sector

¹³⁰ Cabotage output was measured in terms of ton-miles, i.e., the number of ton-miles for wet- and dry-cargo in the U.S. domestic market. The dry-cargo premium was taken from previous estimates used in USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase III: Services*, publication 2422, Sept. 1991. U.S. and world prices for transporting "wet," or petroleum cargo, were obtained from the State of Alaska and Drewry Shipping Consultants, *The Tanker Market: Five Year Forecast of Demand, Supply, and Profitability* (Drewry: London, Nov. 1992).

¹³¹ Drewry Shipping Consultants, *The Tanker Market: Five Year Forecast of Demand, Supply, and Profitability* (Drewry: London, November 1992).

¹³² The tariff equivalent estimated for the Jones Act restrictions, 133 percent, is a weighted average of wet- and dry-cargo tariff equivalents. The wet-cargo tariff equivalent is weighted by the portion of cabotage trade in crude petroleum, 90 percent. The dry-cargo tariff equivalent is weighted by its portion of cabotage trade, 10 percent.

The tariff equivalent for wet cargo, 147 percent, was based on the weighted average of two price gaps. The first price gap, 105 percent, is the difference between the average U.S. price for shipping Alaskan North Slope (ANS) crude petroleum to the U.S. West Coast, \$0.00447/ton-mile, and the average world price for a comparable tanker shipment transported an equal distance, \$0.00218/ton-mile. This gap is weighted by the portion of ANS shipments to the U.S. west coast, 85 percent. The second price gap, 384 percent, is the difference between the average U.S. price for ANS tanker shipments to the U.S. gulf coast, \$0.00423/ton-mile, and the average world price for a comparable tanker shipment transported an equal distance, \$0.00087/ton-mile. This gap is weighted by the portion of ANS shipments to the U.S. gulf coast, 15 percent. The tariff equivalent for dry cargo, 10 percent, is based on estimates reported by Clinton H. Whitehurst, Jr., *American Domestic Shipping in American Ships: Jones Act Costs, Benefits, and Options* (Washington, DC: American Enterprise Institute, 1985).

to foreign competition. Removal of the Jones Act reduces the domestic price of cabotage port services, causing a modest increase in domestic output of these services of \$396 million, or by 5 percent.¹³³ In contrast, the oceanborne Jones Act fleet shuts down completely, with employment declining by 11,905 full-time equivalent workers (jobs) and imports into the cabotage sector increasing by \$3.6 billion. The change in domestic output for the cabotage sector represents composite cabotage services, which are produced using both domestic and imported water transportation services, as well as other water sector services. Hence, composite output rises as domestic employment falls in the Jones Act fleet. Changes in employment reflect oceanborne cabotage services only and the increase in imports are provided by the foreign-flag carriers that enter into U.S. cabotage trade and replace the Jones Act fleet.

The increased shipping activity across the entire water sector increases output in the sector by approximately \$4 billion (8.5 percent). In addition, employment in the water sector also experiences a gain in employment of 12,790 jobs (8.5 percent). Imports in the water sector increase by a small amount, \$12 million (0.1 percent), whereas exports in the water sector increase by approximately \$2 billion, or by 10.6 percent.¹³⁴

The results of the model also suggests that the Jones Act provides indirect protection to its upstream sectors: shipbuilding, maintenance and repair, and management/consulting services. Indeed, one of the arguments in favor of the Jones Act is that it helps to maintain the existence of domestic shipyards. The model indicates that the Jones Act protected approximately 1,016 jobs in shipyards (shipbuilding, maintenance and repair), while ensuring an additional \$102 million of domestic activity in these sectors.¹³⁵ Aside from the cabotage and water sectors, changes in output, employment, and trade in the remaining sectors were small in percentage terms, in most cases measuring less than 0.2 percent.

Air Transport

In 1991, the USITC reviewed the effects of import restraints on the provision of airline services.¹³⁶ That study described an industry that, in the international market place, is governed by a network of bilateral agreements that regulate entry or directly restrict the

¹³³ The cabotage sector includes not only cabotage trade (Jones Act fleet), but also other port services associated with cabotage trade.

¹³⁴ The water sector includes all other services related to non-Jones Act activity such as international traffic between U.S. and foreign ports, dock and port services incidental to international traffic, dock workers' services, tug boat services, and other water transportation services.

¹³⁵ These figures are obtained by summing the estimates for the two upstream sectors: shipbuilding and maintenance and repair.

¹³⁶ USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase III: Services*, publication 2422, Sept. 1991.

Table 27
Jones Act: Economic effects of liberalization, 1991

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
Liberalized sectors:								
Cabotage ³	-11,905	-100.0	396	4.6	3,594	(7)	(6)	(6)
Water	12,790	8.5	3,983	8.5	12	0.1	1,841	10.6
Upstream sectors:								
Management/consulting services	-780	-0.1	-58	-0.1	(4)	(5)	-2	-0.1
Maintenance and repair	-666	(5)	-75	(5)	(6)	(6)	(6)	(6)
Shipbuilding	-350	-0.1	-27	-0.2	(4)	-0.1	-2	-0.1
Downstream sectors:								
Chemicals	5	(5)	31	(5)	2	(5)	7	(5)
Electric utilities	83	(5)	58	(5)	(4)	(5)	(4)	(5)
Logging, sawmills, and millwork	-118	(5)	-8	(5)	1	(5)	-5	-0.1
Petroleum refining and petroleum products	182	0.1	230	0.1	-9	-0.1	37	0.5
Plastics	25	(5)	14	(5)	(4)	(5)	4	(5)
Steel and steel products	-28	(5)	-3	(5)	-5	(5)	1	(5)
Competing sectors:								
Air transportation	256	(5)	45	(5)	2	(5)	22	0.1
Pipelines	9	0.1	7	0.1	(6)	(6)	1	0.1
Railroads	21	(5)	4	(5)	1	0.1	(4)	(5)
Trucking	16	(5)	11	(5)	1	(5)	(6)	(6)
Rest of the U.S. economy:								
Agriculture, forestry, and fisheries	-200	(5)	16	(5)	4	(5)	-20	-0.1
Mining	312	(5)	88	0.1	42	0.1	3	(5)
New construction	-188	(5)	(4)	(5)	(6)	(6)	(6)	(6)
Nondurable manufacturing ..	732	(5)	267	(5)	41	(5)	12	(5)
Durable manufacturing	-1,475	(5)	-139	(5)	119	(5)	-87	(5)
Other transportation, communications, and utilities	-537	(5)	-43	(5)	8	(5)	-7	(5)
Wholesale and retail trade	1,956	(5)	238	(5)	(6)	(6)	(6)	(6)
Banking and other financial services	-372	(5)	10	(5)	5	0.1	-5	(5)
Real estate and other services	3,278	(5)	774	(5)	32	0.1	-5	(5)

¹ Full-time equivalent jobs.

² In millions of dollars in base year prices.

³ The change in domestic output for the cabotage sector is the change in the total value of cabotage services. It represents composite cabotage services, which are produced using both domestic and imported water transportation services, as well as other water sector services. Hence, composite output rises as domestic employment falls in the Jones Act fleet. Changes in employment reflect oceanborne cabotage services only.

⁴ Change less than 1 million dollars.

⁵ Change less than one-tenth of 1 percent.

⁶ Nontradeable sector.

⁷ Not applicable since base level imports are zero.

Source: Estimated by the staff of the USITC.

competitiveness of foreign airlines, by domestic regulatory systems that effectively restrict the entry of foreign carriers, by restrictions on ancillary domestic markets that impair a foreign carrier's ability to compete, and by subsidization and state ownership of competing foreign airlines. That description remains essentially true today, although there are prospects for change in at least some areas.

Recent Developments in International Air Services

A number of foreign airlines have requested authority to exceed the 25 percent ownership share to which they are limited by law.¹³⁷ In 1989, Northwest Airlines and KLM reached an agreement by which the airlines share flights on two routes. The agreement called for KLM's payment of \$400 million for a 20-percent stake in Northwest and a 10.6-percent share of voting rights in Northwest's parent, Wings Holdings. British Airways had put together a deal to acquire 44 percent of USAir, but failed to get U.S. approval for this and had to scale back to a 24.6-percent stake.

On May 24, 1993, a special commission established by an act of Congress was empaneled. The National Commission to Ensure a Strong Competitive Airline Industry has recommended ways to revive that industry. Its report addresses the impact of pricing policies, deregulation, bankruptcy laws, foreign investment, and Government noise regulation on the airline industry.¹³⁸ Among its recommendations are several that could affect the ability of foreign firms to enter the U.S. market.

Economic Effects of Removing U.S. Restraints in Air Transport

The right to enter the domestic U.S. air transport market might enable foreign carriers to attain greater economies of scale to operate more efficiently in the world air transport markets. Access to local domestic traffic has become increasingly important to support viable service in international markets. On long-haul international routes, the difference between success and failure can be determined by the level of support and connections to domestic flights serving a carrier's international gateway. Foreign carriers serving the U.S. market are currently dependent upon U.S.-flag carriers to serve traffic behind their gateways.

The system of bilateral agreements covering international air services and the entry of foreign carriers into domestic markets make quantitative

¹³⁷ Sec. 1301(3) of the Federal Aviation Act of 1958, 49 U.S.C. 1301(3).

¹³⁸ The National Commission to Ensure a Strong Competitive Airline Industry, *Change, Challenge, and Competition: A Report to the President and Congress* (Washington, DC: GPO, 1993).

estimation of a potential liberalization of foreign entry into the market virtually impossible. The terms of international competition and pricing vary by region and route, and consequently, domestic service and fare structures of foreign carriers are seldom determined by market forces. Therefore, it is very difficult to assess the effects of foreign carrier entry into the U.S. market with standard economic models. However, on a qualitative level, permitting free entry of foreign carriers into the U.S. domestic market would likely result in a more competitive international air transport market, over the long term. The specific outcome depends on the prospects for change in the bilateral agreement system.

The countries of the European Community (EC) are in the process of opening the EC airline market to European carriers.¹³⁹ This process may benefit U.S. carriers, but some countries are moving in the opposite direction. For example, France has terminated its bilateral agreement with the United States, and Germany has threatened to do so.¹⁴⁰ The National Commission on the Airline Industry recommends a multilateral agreement on airline routes and pricing, replacing the system of bilateral agreements presently in effect. The Commission's report states the need for moving these agreements into a multilateral context:

"The Commission ... believes bilateral agreements cannot adequately protect or enhance U.S. interests and that continued reliance on that approach will erode those interests. The increasingly contentious bilateral relationships already mentioned are resulting in agreements or de facto relationships either markedly more rigid and protectionist than before, or seriously out of balance.... Because of our country's geographic size and population, bilateral agreements can result in the U.S. granting foreign carriers greater access to the immense and diverse U.S. air travel market without corresponding competitive opportunities for U.S. carriers." (p. 21.)¹⁴¹

In the domestic market, the effect of the entry of foreign carriers is likely to be small since the U.S. market is already deregulated, free entry already prevails for potential U.S. entrants, and the level of competition has driven U.S. carriers to levels of efficiency much greater than those of most of their foreign rivals. This is another reason for many foreign governments to resist any renegotiation of agreements that would reciprocally open their own markets to U.S. competition.

Broadcasting

The broadcasting industry has become diverse, and its boundaries in many cases uncertain. For example, cellular telecommunications brings the telephone

¹³⁹ See USITC, *Global Competitiveness of U.S. Advanced-Technology Manufacturing Industries: Large Civil Aircraft*, publication 2667, Aug. 1993.

¹⁴⁰ National Airline Commission, *Change, Challenge, and Competition*.

¹⁴¹ *Ibid.*

industry into the broadcast spectrum, and cable television pulls part of the television industry out of that spectrum. Nevertheless, in this industry, the principal barrier at the national level to foreign participation remains the restriction on foreign ownership contained in the Communications Act of 1934,¹⁴² which governs commercial radio and television broadcasting only. That law in essence prohibits ownership of a broadcasting license by foreign governments or their agents, by corporations organized under the laws of a foreign country, or by corporations with more than 25 percent of the capital stock held by foreign individuals or corporations.

It is not possible to estimate the effect of removing these ownership restrictions, which are in fact restrictions on foreign investment in a U.S. industry. The number of commercial licenses remains restricted by the current allocation of the radio spectrum, and existing licenses are owned. If additional bids for these licenses (or, equivalently, for the shares of the firms holding the licenses) were permitted from potential foreign owners, this could cause some increase in the value of broadcasting firms, although partial foreign ownership is not currently prohibited. It cannot be said convincingly that existing restrictions have more than a slight or negligible effect on the actual level of competition and consumer welfare.

Banking, Insurance, and Other Financial Services

These industries are intensely competitive and lightly concentrated in the United States. There are thousands of banks and insurance firms that are regulated, particularly in the insurance industry, at the state level. National barriers affecting the international movement of banking and securities-related services may be grouped into four broad categories 1) those directly affecting cross-border transactions, 2) those relating to establishment (i.e., entry through operations within another country), 3) those relating to the nature of competition within foreign markets, and 4) those not directly related to financial services. The first is concerned with capital, foreign exchange control, and the regulation of trade in securities. The second concerns the form of entry or establishment of foreign firms. The third category involves the extensive national regulation generally found in financial service

¹⁴² Sec. 310 of the Communications Act of 1934, 47 U.S.C. 310.

industries; this regulation may place distinct demands on foreign providers in terms of reserve requirements, capitalization, and disclosure. The fourth category picks up such measures as immigration rules, limits on repatriation of interest, dividends, and profits, and cross-border data flows.

Most foreign financial institutions surveyed in a 1988 General Accounting Office (GAO) study believed that the United States generally affords foreign firms equal treatment with domestic firms.¹⁴³ With respect to barriers to establishment, the United States has no explicit barriers to the entry of foreign banks.¹⁴⁴ Although quantitative judgment can be made, it seems unlikely that the degree of competition in the U.S. financial sector is significantly affected by barriers to the imports of financial services.

Construction

The 1991 USITC report on barriers to trade in services included a discussion of the construction industry. The barriers identified for this industry consisted of state licensing requirements for architects and engineers and of the Brooks-Murkowski Amendment to the Continuing Resolution for Fiscal Year 1988. This bill prohibited countries that the United States Trade Representative designated as unfair traders in construction services from participating in construction projects funded by the U.S. Government. Its terms, renewed the following year as an amendment to the Airport and Airways Improvement Act, expired in October 1991. Japan was the only country designated as an unfair trader under the terms of the amendment, and a minuscule share of the construction undertaken in the United States was affected. The 1991 study concluded that it seemed unlikely that the Brooks-Murkowski Amendment significantly hindered the ability of Japanese firms to export construction services to the United States. Since that time, the legislation has not been replaced. All States have professional licensing requirements for architects and engineers, but these requirements do not significantly impede the ability of foreign firms to operate in the United States.

¹⁴³ GAO, *International Finance: Competitive Concerns of Foreign Financial Firms in Japan, the United Kingdom, and the United States*, GAO/NSIAD-88-171, June 1988.

¹⁴⁴ Ingo Walter, *Global Competition in Financial Services*, (Washington: American Enterprise Institute, 1988).

CHAPTER 6

Significant Tariff Restraints

This chapter examines the effects of liberalizing sectors that are protected with significant tariff restraints. Unlike earlier chapters, the sectors analyzed here are not subject to quantitative restraints. The 12 sectors considered in this chapter and their average ad valorem equivalent tariff rates in 1991 are listed in table 28.

The analysis for each high tariff sector is presented in the following format. First, products contained in a high tariff sector and their current tariff rates are described, and a summary data table is provided for each sector as a reference for evaluating the economic effects estimated by the USITC model. Then, the economic effects of removing the tariffs are discussed by reporting the results from the USITC CGE model. These results include the economywide welfare impact, and the quantitative and percentage changes in employment, output, imports, and exports.

Economic Effects of Removing Significant Tariff Restraints

Nonrubber Footwear

Current Tariff Status

This category includes leather and vinyl shoes, boots, and sandals; slippers of all materials; and some athletic shoes. This footwear is usually referred to as nonrubber footwear and is classified for tariff purposes under chapter 64 of the Harmonized Tariff Schedule (HTS). Rates of duty on nonrubber footwear range from free to 15 percent. Nonrubber footwear, with the exception of disposable footwear, is not eligible for duty-free treatment under the Generalized System of Preferences (GSP) or the Caribbean Basin Economic Recovery Act (CBERA). It is, however, eligible for duty-free treatment if assembled in eligible CBERA countries entirely from U.S. components. U.S. imports of nonrubber footwear from Israel enter duty free under the United States-Israel Free-Trade Area Implementation Act, and those from Canada enter at preferential rates under the United States-Canada Free-Trade Agreement (CFTA). Summary data for the nonrubber footwear sector are presented in table 29.

Economic Effects of Tariff Removal

The U.S. economy experiences a welfare gain of \$170 million from tariff removal in the nonrubber footwear sector; the largest gain of these 12 cases. A large contribution to this welfare gain is the 6.0 percent fall in the overall price of nonrubber footwear experienced by consumers. Across the economy, liberalization brings negligible gains in net output and employment. In addition, net imports increase by \$279 million in the economy, as net exports gain by \$249 million.

Detailed economic effects of tariff removal in this sector are presented in table 30. Direct effects on the nonrubber footwear sector are a \$110 million fall in output and almost 1,400 fewer full-time equivalent workers (jobs). Both figures represent a 2-percent decline from original levels. The effect of liberalization on imports is larger, with an increase in imports of \$455 million, almost a 6-percent increase. Both upstream sectors are affected, with leather tanning and finishing experiencing a \$17 million loss and almost 100 fewer jobs. Trade effects for the upstream sectors are small, each \$6 million or less. No significant downstream sectors exist, since the products in the nonrubber footwear sector are produced mainly for retail.

Watches, Clocks, and Parts

Current Tariff Status

Included in this sector are various types of clocks, apparatus for recording and measuring time or intervals of time, and certain switches. The calculation of duties on various watches, clocks, watch movements, and clock movements requires that these articles be separated into their component parts and that each component be separately valued. The individual components are separately reported under statistical suffixes. The sum of the values of the individual components equals the value of the article. Coverage under the HTS includes solid-state watches and clocks under the same tariff headings as those designated for traditional mechanical timepieces. The average ad valorem tariff, on a dutiable basis, is 9.0 percent. Summary data for this sector are presented in table 31.

Table 28
Industries with significant average MFN tariff rates, 1991¹
(Percent)

SIC No.	Product Description	Average MFN Tariff Rate
314 ²	Nonrubber footwear	10.7
3873	Watches, clocks, and parts	9.0
3562	Ball and roller bearings, and parts	9.0
3229	Pressed and blown glass, n.e.c.	11.0
3961	Costume jewelry and costume novelties	9.7
2865	Cyclic organic crudes and intermediates	13.1
2037	Frozen fruits, fruit juices, and vegetables	24.4
3253	Ceramic wall and floor tile	19.1
3172	Personal leather goods	11.4
3675	Electronic capacitors	9.8
3151	Leather gloves and mittens	14.0
3262	China tableware	13.8

¹ Ad valorem equivalent, dutiable value basis.

² Data constraints only allow the nonrubber footwear sector to be disaggregated to the 3-digit SIC level.

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

Table 29
Nonrubber footwear: Summary data, 1989-91
(Million dollars, except where indicated)

Item	1989	1990	1991
Shipments	4,262.0	4,232.0	3,953.0
Employment (1,000 workers)	66.0	62.1	59.9
Imports	6,014.4	7,015.4	6,732.0
Exports	189.9	248.9	282.0

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

Table 30
Nonrubber footwear: Economic effects of tariff removal, 1991

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
Liberalized sector:								
Nonrubber footwear	-1,472	-2.0	-110	-2.0	455	5.9	10	2.3
Upstream sectors:								
Boot and shoe cut stock ...	-39	-1.1	-3	-1.1	-6	-1.2	-1	-1.0
Leather tanning and finishing	-94	-0.6	-17	-0.6	-4	-0.6	-4	-0.6
Rest of the U.S. economy:								
Agriculture, forestry, and fisheries	391	(³)	51	(³)	-2	(³)	37	0.1
Mining	94	(³)	14	(³)	-2	(³)	3	(³)
Construction	39	(³)	2	(³)	(⁴)	(⁴)	(⁴)	(⁴)
Nondurable manufacturing ..	331	(³)	43	(³)	-36	(³)	25	(³)
Durable manufacturing	1,675	(³)	253	(³)	-85	(³)	106	(³)
Transportation, communications, and utilities	402	(³)	52	(³)	-22	(³)	35	(³)
Wholesale and retail trade	-227	(³)	-25	(³)	(⁴)	(⁴)	(⁴)	(⁴)
Finance, insurance, and real estate	-169	(³)	-71	(³)	-3	(³)	5	(³)
Other services	-181	(³)	-31	(³)	-16	(³)	33	(³)

¹ Full-time equivalent jobs.

² In millions of dollars in base year prices.

³ Change less than one-tenth of 1 percent.

⁴ Nontradeable sector.

Source: Estimated by the staff of the USITC.

Table 31
Watches, clocks, and parts: Summary data, 1989-91
(Million dollars, except where indicated)

Item	1989	1990	1991
Shipments	1,377.7	1,302.9	1,209.7
Employment (1,000 workers)	10.5	9.4	8.4
Imports	843.0	1,610.7	2,080.3
Exports	133.9	153.5	166.9

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

Economic Effects of Tariff Removal

The U.S. economy experiences a welfare gain of \$101 million from tariff removal in the watches, clocks, and parts sector. A large contribution to this welfare gain is the 7.2 percent fall in the overall price of watches, clocks, and parts experienced by consumers. Across the economy, liberalization brings negligible gains in net output and jobs. Net imports increase by \$162 million, as net exports gain by \$38 million.

Detailed economic effects of tariff removal in this sector are presented in table 32. Direct effects on this sector from lost tariff protection seem to be unexpected. That is, import penetration increases by \$91 million (a 3.8-percent increase), and U.S. output, employment, and exports also increase, albeit slightly. The sector experiences increases in output by \$9 million, employment by 217 jobs, and exports by \$5 million. All three figures represent an increase of less than 2 percent from original levels.

This result stems from the level of aggregation in this sector. As discussed in chapter 2, this sector includes not only watches, clocks, and clockwork operated devices, but also the parts that serve as the inputs in the production of these finished goods. For a sector in which some of the goods are inputs in the production of other goods in the sector, tariff removal creates two effects. The first effect is the normal output and price decline for all types of goods in the sector as they face increased import penetration. The second effect is a boost to the production of finished goods in the sector from the lower input prices induced by liberalization. When the second effect outweighs the first effect, overall output in the sector can increase from lost tariff protection.

In general, the tariff removal in watches, clocks, and parts affects upstream and downstream sectors very little. The largest change is in the automotive industry, which increases output by \$15 million. All other sectors experience output changes of less than \$5 million.

Ball And Roller Bearings, And Parts

Current Tariff Status

This sector includes establishments that are primarily engaged in manufacturing ball and roller bearings (including ball or roller bearing pillow block, flange, takeup cartridge, and hangar units) and parts. Ball and roller bearings are used in a variety of machinery, such as automobiles, farm implements, materials-handling equipment, motors, pumps, compressors, various home appliances, and aircraft engines. Ball bearings are better suited for high-speed applications than roller bearings because they have a smaller area of contact with the moving surfaces. The tariff on ball bearings, other than those with integral shafts, is 11 percent. The tariff rate on roller bearings and parts ranges from 4.2 to 6.5 percent. Summary data for this sector are presented in table 33.

Economic Effects of Tariff Removal

The U.S. economy experiences a welfare gain of \$45 million from tariff removal in the ball and roller bearings, and parts sector. A large contribution to this welfare gain is the 1.8 percent fall in the overall price of ball and roller bearings, and parts, experienced by consumers. Across the economy, net changes in output and employment are negligible. In addition, net imports fall by \$3 million, as net exports increase by \$29 million.

Detailed economic effects of tariff removal in this sector are presented in table 34. Direct effects on this sector from lost tariff protection are a decline in output of \$61 million and 425 jobs. Both figures represent less than a 2-percent decline from original output and employment levels. Removal of the tariff also boosts imports by \$49 million (approximately 5 percent) and reduces exports by \$10 million (less than 2 percent).

Table 32
Watches, clocks, and parts: Economic effects of tariff removal, 1991

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
Liberalized sector:								
Watches, clocks, and parts	217	1.4	9	1.4	91	3.8	5	1.4
Upstream sector:								
Miscellaneous plastics products, materials, and resins	17	(⁴)	3	(⁴)	(³)	(⁴)	1	(⁴)
Downstream sectors:								
Automotive industry	46	(⁴)	15	(⁴)	-7	(⁴)	6	(⁴)
Engineering and scientific equipment	16	(⁴)	3	(⁴)	-1	(⁴)	1	(⁴)
Costume jewelry	(³)	(⁴)	(³)	(⁴)	(³)	(⁴)	(³)	(⁴)
Medical facilities	-53	(⁴)	-4	(⁴)	(³)	(⁴)	(³)	(⁴)
Rest of the U.S. economy:								
Agriculture, forestry, and fisheries	47	(⁴)	6	(⁴)	(³)	(⁴)	5	(⁴)
Mining	11	(⁴)	2	(⁴)	(³)	(⁴)	(³)	(⁴)
Construction	-2	(⁴)	(³)	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Nondurable manufacturing ..	9	(⁴)	1	(⁴)	-6	(⁴)	3	(⁴)
Durable manufacturing	372	(⁴)	52	(⁴)	-11	(⁴)	21	(⁴)
Transportation, communications, and utilities	41	(⁴)	6	(⁴)	-4	(⁴)	6	(⁴)
Wholesale and retail trade	-158	(⁴)	-11	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Finance, insurance, and real estate	-11	(⁴)	-27	(⁴)	-1	(⁴)	1	(⁴)
Other services	-277	(⁴)	-17	(⁴)	-3	(⁴)	5	(⁴)

¹ Full-time equivalent jobs.

² In millions of dollars in base year prices.

³ Change less than 1 million dollars.

⁴ Change less than one-tenth of 1 percent.

⁵ Nontradeable sector.

Source: Estimated by the staff of the USITC.

Table 33
Ball and roller bearings, and parts: Summary data, 1989-91

(Million dollars, except where indicated)

Item	1989	1990	1991
Shipments	4,161.2	4,241.9	3,892.7
Employment (1,000 workers)	39.1	39.0	36.6
Imports	931.5	873.3	811.6
Exports	473.5	689.0	673.7

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

Table 34
Ball and roller bearings, and parts: Economic effects of tariff removal, 1991

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
Liberalized sector:								
Ball and roller bearings, and parts	-425	-1.3	-61	-1.3	49	4.9	-10	-1.2
Upstream sectors:								
Steel	-32	(⁴)	-7	(⁴)	-1	(⁴)	(³)	(⁴)
Downstream sectors:								
Farm and garden machinery	11	(⁴)	2	(⁴)	-1	(⁴)	1	(⁴)
Machine tools	7	(⁴)	1	(⁴)	-1	(⁴)	(³)	(⁴)
Industrial machinery	37	(⁴)	5	(⁴)	-2	(⁴)	3	(⁴)
Special industrial machinery	18	(⁴)	3	(⁴)	-1	(⁴)	1	(⁴)
Automotive industry	115	(⁴)	38	(⁴)	-2	(⁴)	10	(⁴)
Aircraft and missile equipment	90	(⁴)	13	(⁴)	(³)	(⁴)	11	(⁴)
Rest of the U.S. economy:								
Agriculture, forestry, and fisheries	16	(⁴)	2	(⁴)	(³)	(⁴)	5	(⁴)
Mining	5	(⁴)	1	(⁴)	(³)	(⁴)	(³)	(⁴)
Construction	-2	(⁴)	(³)	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Nondurable manufacturing ..	43	(⁴)	9	(⁴)	-1	(⁴)	2	(⁴)
Durable manufacturing	191	(⁴)	27	(⁴)	-3	(⁴)	6	(⁴)
Transportation, communications, and utilities	17	(⁴)	3	(⁴)	-1	(⁴)	2	(⁴)
Wholesale and retail trade ..	-48	(⁴)	-3	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Finance, insurance, and real estate	-16	(⁴)	-3	(⁴)	(³)	(⁴)	(³)	(⁴)
Other services	-30	(⁴)	-1	(⁴)	(³)	(⁴)	1	(⁴)

- ¹ Full-time equivalent jobs.
- ² In millions of dollars in base year prices.
- ³ Change less than 1 million dollars.
- ⁴ Change less than one-tenth of 1 percent.
- ⁵ Nontradeable sector.

Source: Estimated by the staff of the USITC.

Upstream, the steel sector is affected, but output loss is less than \$10 million. All significant downstream sectors benefit, with the automotive industry experiencing a \$38 million gain in output and 115 additional jobs. Trade effects for the downstream sectors are less than \$10 million, with the exception of the aircraft and missile equipment and the automotive industry sectors.

Pressed and Blown Glass, n.e.c.

Current Tariff Status

The category includes household glassware, art and ornamental glassware, illuminating glassware, scientific and laboratory glassware, and other

miscellaneous glassware and glass articles. The glassware included in this sector has been subject to a wide range of tariffs reflecting the variety of products. Illuminating glassware, scientific and laboratory glassware, and other miscellaneous glassware are subject to lower rates of duty than those for household glassware. Household, art, and ornamental glassware tariff duties range from 6 to 38 percent, with most household glassware excluded from GSP eligibility. Other glassware duties range from 2.4 to 15 percent. All HTS subheadings are eligible for duty-free treatment for imports entering from designated CBERA, GSP, Andean countries, and Israel (with the GSP exceptions in household glassware noted above). Under the CFTA, U.S. imports from Canada enter at tariffs ranging from free to 7.5 percent. Summary data for this sector are presented in table 35.

Table 35
Pressed and blown glass, n.e.c.: Summary data, 1989-91

(Million dollars, except where indicated)

Item	1989	1990	1991
Shipments	3,935.0	3,898.3	3,815.7
Employment (1,000 workers)	35.2	35.4	32.9
Imports	873.5	869.0	880.6
Exports	544.7	625.0	655.5

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

Economic Effects of Tariff Removal

The U.S. economy experiences a welfare gain of \$44 million from tariff removal in the pressed and blown glass and glassware sector. A large contribution to this welfare gain is the 1.1 percent fall in the overall price of pressed and blown glass and glassware experienced by consumers. Across the economy, net changes in output and jobs are negligible. In addition, net imports increase by \$58 million, as net exports gain by \$35 million.

Detailed economic effects of tariff removal for this sector are presented in table 36. Direct effects on this sector from lost tariff protection are a decline in output of \$27 million and 249 fewer jobs. Both figures represent a less than one half of 1 percent decline from original levels. Imports increase by about 2 percent, or \$35 million.

Economic effects on significant upstream sectors are extremely small or negligible. Downstream sectors gain in general, but similar to the upstream sectors, the effects are small. Only the automotive industry experiences more than a \$5 million gain (\$31 million). It also experiences the largest gain in jobs (96 full-time equivalent positions).

Costume Jewelry and Costume Novelties

Current Tariff Status

There are three major categories (in terms of usage) of jewelry:¹⁴⁵ articles of personal adornment, small articles ordinarily carried on the person or in a handbag, and religious articles. Articles of personal adornment typically include, among other items, rings, bracelets, brooches, pendants, and necklaces. Small articles include money clips and key chains, among others. Religious articles consist principally of rosaries, crucifixes, and medals. All costume jewelry

¹⁴⁵ This sector includes watch bands of base metal; however, under the HTS, watch bands are classified as parts of watches rather than jewelry.

articles are made of nonprecious materials and may often be set with synthetic or imitation gemstones or imitation pearls. Under the HTS, tariffs on costume jewelry range from free to 14 percent. Summary data for this sector are presented in table 37.

Economic Effects of Tariff Removal

The U.S. economy experiences a welfare gain of \$42 million from tariff removal in the costume jewelry and costume novelties sector. A large contribution to this welfare gain is the 3.0 percent fall in the overall price of costume jewelry and costume novelties experienced by consumers. Across the economy, net changes in output and employment are negligible. In addition, net imports increase by \$51 million, as exports gain by \$19 million.

Detailed economic effects of tariff removal in this sector are presented in table 38. Direct effects on this sector from lost tariff protection are a decline in output of \$7 million and 72 fewer jobs. Both figures represent a decline of less than 1 percent from original levels. Import penetration from liberalization is relatively more significant, increasing by \$50 million (over 6 percent increase). The effect on exports is negligible in value terms. Likewise, the upstream and downstream sectors are only marginally affected by liberalization in this sector.

Cyclic Organic Crudes and Intermediates

Current Tariff Status

This category includes certain benzenoid intermediate chemicals and mixtures used to produce various types of finished chemical products, such as plastics, synthetic fibers, dyes, organic pigments, pharmaceuticals, and pesticides. Tariff rates vary by product, with an average ad valorem tariff rate of 13.1 percent (dutiable value basis). Summary data for this sector are presented in table 39.

Table 36
Pressed and blown glass, n.e.c.: Economic effects of tariff removal, 1991

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
Liberalized sector:								
Pressed and blown glass, n.e.c.	-249	-0.2	-27	-0.2	35	2.1	-4	-0.2
Upstream sectors:								
Paperboard containers and boxes	-2	(4)	(3)	(4)	(3)	(4)	(3)	(4)
Industrial organic and inorganic chemicals	1	(4)	(3)	(4)	(3)	(4)	(3)	(4)
Utilities	-5	(4)	-2	(4)	(3)	(4)	(3)	(4)
Downstream sectors:								
Miscellaneous plastics products, materials, and resins	25	(4)	4	(4)	-1	(4)	1	(4)
Lighting fixtures and lamps	4	(4)	1	(4)	-1	(4)	(3)	(4)
Electronic components	38	(4)	5	(4)	-1	(4)	2	(4)
Automotive industry	96	(4)	31	(4)	-3	(4)	8	(4)
Medical facilities and physicians	-6	(4)	-1	(4)	(3)	(4)	(3)	(4)
Rest of the U.S. economy:								
Agriculture, forestry, and fisheries	7	(4)	1	(4)	(3)	(4)	1	(4)
Mining	1	(4)	(3)	(4)	(3)	(4)	(3)	(4)
Construction	-2	(4)	(3)	(4)	(5)	(5)	(5)	(5)
Nondurable manufacturing ..	10	(4)	2	(4)	-1	(4)	1	(4)
Durable manufacturing	226	(4)	32	(4)	-3	(4)	11	(4)
Transportation, communications, and utilities	6	(4)	1	(4)	-1	(4)	1	(4)
Wholesale and retail trade	-31	(4)	-2	(4)	(5)	(5)	(5)	(5)
Finance, insurance, and real estate	-41	(4)	-9	(4)	(3)	(4)	(3)	(4)
Other services	-19	(4)	-1	(4)	-1	(4)	1	(4)

¹ Full-time equivalent jobs.

² In millions of dollars in base year prices.

³ Change less than 1 million dollars.

⁴ Change less than one-tenth of 1 percent.

⁵ Nontradeable sector.

Source: Estimated by the staff of the USITC.

Table 37
Costume jewelry and costume novelties: Summary data, 1989-91

(Million dollars, except where indicated)

Item	1989	1990	1991
Shipments	1,314.8	1,417.3	1,399.3
Employment (1,000 workers)	19.2	19.2	17.6
Imports	510.5	535.8	573.3
Exports	91.2	113.7	127.5

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

Table 38
Costume jewelry and costume novelties: Economic effects of tariff removal, 1991

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
Liberalized sector:								
Costume jewelry and costume novelties	-72	-0.4	-7	-0.4	50	6.1	(³)	-0.2
Upstream sectors:								
Personal leather goods	-1	(⁴)	(³)	(⁴)	(³)	(⁴)	(³)	(⁴)
Primary nonferrous metals	0	(⁴)	(³)	(⁴)	(³)	(⁴)	(³)	(⁴)
Jewelers' materials and lapidary work	-1	(⁴)	(³)	(⁴)	(³)	(⁴)	(³)	(⁴)
Downstream sectors:								
Cosmetics industry	2	(⁴)	1	(⁴)	(³)	(⁴)	(³)	(⁴)
Watches, clocks, and parts	2	(⁴)	(³)	(⁴)	(³)	(⁴)	(³)	(⁴)
Rest of the U.S. economy:								
Agriculture, forestry, and fisheries	43	(⁴)	6	(⁴)	(³)	(⁴)	4	(⁴)
Mining	10	(⁴)	2	(⁴)	(³)	(⁴)	(³)	(⁴)
Construction	2	(⁴)	(³)	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Nondurable manufacturing ..	40	(⁴)	6	(⁴)	-4	(⁴)	3	(⁴)
Durable manufacturing	174	(⁴)	27	(⁴)	-10	(⁴)	12	(⁴)
Transportation, communications, and utilities	36	(⁴)	5	(⁴)	-3	(⁴)	4	(⁴)
Wholesale and retail trade	-57	(⁴)	-4	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Finance, insurance, and real estate	-36	(⁴)	-10	(⁴)	(³)	(⁴)	1	(⁴)
Other services	-91	(⁴)	-7	(⁴)	-2	(⁴)	4	(⁴)

¹ Full-time equivalent jobs.

² In millions of dollars in base year prices.

³ Change less than 1 million dollars.

⁴ Change less than one-tenth of 1 percent.

⁵ Nontradeable sector.

Source: Estimated by the staff of the USITC.

Table 39
Cyclic organic crudes and intermediates: Summary data, 1989-91
(Million dollars, except where indicated)

Item	1989	1990	1991
Shipments	14,940.0	14,763.4	14,096.1
Employment (1,000 workers)	22.8	23.0	23.5
Imports	1,621.8	1,853.6	1,665.4
Exports	2,241.2	2,300.0	2,086.3

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

Economic Effects of Tariff Removal

The U.S. economy experiences a welfare gain of \$24 million from tariff removal in the cyclic organic crudes and intermediates sector. A large contribution to this welfare gain is the 0.7 percent fall in the overall price of cyclic organic crudes and intermediates experienced by consumers. Across the economy, liberalization also brings negligible gains in output and employment. In addition, net imports rise by \$107 million, as net exports gain by \$87 million.

Detailed economic effects of tariff removal in this sector are presented in table 40. Direct effects on this sector from lost tariff protection are a \$264 million fall in output and a loss of over 800 jobs in the cyclic organic crudes and intermediates sector. Both figures represent a less than 1 percent decline from original levels in this relatively large sector. Imports in this sector increase by \$193 million (less than 2 percent), while exports fall by \$42 million.

Of the upstream sectors, crude petroleum/natural gas and utilities experience declines in output over \$10 million each and a combined loss of over 100 jobs. Motor freight transportation suffers negligible effects. Import and export effects for the upstream sectors are small as well.

All thirteen downstream sectors benefit from the tariff removal. Medical facilities experience the largest gain, with a \$31 million increase in output and almost 400 additional jobs. The plastics materials and resins sector is next, with a \$23 million output gain and 72 additional workers. The miscellaneous plastics products sector and soap and other detergents sector are the only other sectors to have output increases by more than \$10 million. Noticeable trade effects occur with the plastics materials and resins sector, which experiences a \$13 million increase in exports and a \$7 million fall in imports. Other downstream sectors see a similar decline in imports and increase in exports, but for these sectors the effects are even smaller.

Frozen Fruits, Fruit Juices, and Vegetables

Current Tariff Status

This category includes establishments primarily engaged in freezing fruits, fruit juices, and vegetables. These establishments also produce important byproducts, such as fresh or dried citrus pulp. Frozen concentrated orange juice accounts for over 50 percent of the imports in this category, followed by frozen broccoli, about 25 percent, and frozen strawberries, about 10 percent. Under the HTS, the rate of duty for all fruit juices is 9.25 cents per liter for concentrate and

5.3 cents for single strength.¹⁴⁶ Frozen fruits have duty rates varying from free for frozen blueberries, 7 percent for frozen raspberries, 14 percent for frozen strawberries, to 17.5 percent for frozen papayas. The tariff rate on most frozen vegetables imported into the United States has been 17.5 percent ad valorem since the 1948 General Agreement on Tariffs and Trade (GATT) agreement.¹⁴⁷ Summary data for this sector are provided in table 41.

Economic Effects of Tariff Removal

The U.S. economy experiences a welfare gain of \$13 million from tariff removal in the frozen fruits, fruit juices, and vegetables sector. A large contribution to this welfare gain is the 2.0 percent fall in the overall price of frozen fruits, fruit juices, and vegetables experienced by consumers. Across the economy, the net change in output is negligible, while employment experiences a negligible gain. In addition, net imports increase by \$100 million, as net exports gain \$79 million.

Detailed economic effects of removal of the tariff in this sector are presented in table 42. Direct effects on this sector from lost tariff protection are a reduction in output of \$108 million and a loss of over 500 jobs. Both represent less than 2 percent declines from original levels. Imports of frozen fruits, fruit juices, and vegetables rise by a substantial \$164 million (over a 14-percent increase), whereas exports decline slightly.

As expected, significant upstream sectors are adversely affected, though the effects are small, with losses to each sector less than \$10 million. A total of 258 workers across the upstream sectors would be displaced. Both downstream sectors benefit from tariff removal, with the restaurants sector increasing output by \$14 million and adding over 200 jobs. Trade effects for both the downstream and upstream sectors are minimal.

Ceramic Wall and Floor Tile

Current Tariff Status

This category covers ceramic tile, glazed or unglazed, used to cover floors or walls. For purposes of applying tariff duties, the HTS classifies tiles into three categories on the basis of size or glazing: mosaic, glazed mosaic and unglazed nonmosaic. The tariff rates for the three categories are 20 percent on mosaic tiles, 19 percent on glazed nonmosaic tiles, and 20 percent on unglazed nonmosaic tiles. Summary data for the ceramic wall and floor tile sector are provided in table 43.

¹⁴⁶ Exceptions include 1) frozen apple juice, which is free of duty, 2) frozen grape juice at 6.6 cents per liter, and 3) frozen pineapple juice at 1.3 cents per liter.

¹⁴⁷ This rate applies to such frozen vegetables as asparagus, broccoli, and cauliflower.

Table 40
Cyclic organic crudes and intermediates: Economic effects of tariff removal, 1991

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
Liberalized sector:								
Cyclic organic crudes and intermediates	-817	-0.3	-264	-0.3	193	1.5	-42	-0.2
Upstream sectors:								
Crude petroleum and natural gas	-64	(⁴)	-13	(⁴)	-8	(⁴)	(³)	(⁴)
Motor freight transportation	-10	(⁴)	(³)	(⁴)	(³)	(⁴)	(³)	(⁴)
Utilities	-43	(⁴)	-13	(⁴)	(³)	(⁴)	(³)	(⁴)
Downstream sectors:								
Paper and pulp mills	36	(⁴)	8	(⁴)	-3	(⁴)	2	(⁴)
Agricultural chemicals	5	(⁴)	3	(⁴)	(³)	(⁴)	2	(⁴)
Plastics materials and resins	72	0.1	23	0.1	-7	-0.4	13	0.2
Synthetic rubber	7	(⁴)	3	(⁴)	-1	-0.2	2	0.2
Man-made and organic fibers	25	(⁴)	5	(⁴)	-1	-0.1	2	0.1
Pharmaceutical industry	37	(⁴)	8	(⁴)	-2	(⁴)	1	(⁴)
Soap and other detergents	35	(⁴)	14	(⁴)	(³)	(⁴)	1	0.1
Paints and allied products	4	(⁴)	1	(⁴)	(³)	-0.1	(³)	0.1
Petroleum refining	4	(⁴)	6	(⁴)	-1	(⁴)	2	(⁴)
Miscellaneous plastics products	93	(⁴)	14	(⁴)	-6	-0.1	2	(⁴)
Steel industry	39	(⁴)	8	(⁴)	-2	(⁴)	1	(⁴)
Photographic supplies and equipment	69	(⁴)	6	(⁴)	-2	(⁴)	2	0.1
Medical facilities	396	(⁴)	31	(⁴)	(³)	(⁴)	(³)	(⁴)
Rest of the U.S. economy:								
Agriculture, forestry, and fisheries	231	(⁴)	34	(⁴)	(³)	(⁴)	19	0.1
Mining	-29	(⁴)	-3	(⁴)	-1	(⁴)	(³)	(⁴)
Construction	-24	(⁴)	-2	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Nondurable manufacturing ..	462	(⁴)	76	(⁴)	-14	(⁴)	15	(⁴)
Durable manufacturing	880	(⁴)	140	(⁴)	-30	(⁴)	52	(⁴)
Transportation, communications, and utilities	45	(⁴)	7	(⁴)	-4	(⁴)	7	(⁴)
Wholesale and retail trade	-269	(⁴)	-12	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Finance, insurance, and real estate	-222	(⁴)	-33	(⁴)	-1	(⁴)	1	(⁴)
Other services	-341	(⁴)	-10	(⁴)	-3	(⁴)	5	(⁴)

¹ Full-time equivalent jobs.

² In millions of dollars in base year prices.

³ Change less than 1 million dollars.

⁴ Change less than one-tenth of 1 percent.

⁵ Nontradeable sector.

Source: Estimated by the staff of the USITC.

Table 41
Frozen fruits, fruit juices, and vegetables: Summary data, 1989-91

(Million dollars, except where indicated)

Item	1989	1990	1991
Shipments	7,158.6	7,411.9	7,286.2
Employment (1,000 workers)	46.9	46.2	46.0
Imports	992.1	1260.8	1060.4
Exports	509.7	643.3	727.9

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

Table 42
Frozen fruits, fruit juices, and vegetables: Economic effects of tariff removal, 1991

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
Liberalized sector:								
Frozen fruit, fruit juices, and vegetables	-512	-1.5	-108	-1.4	164	14.8	-8	-1.3
Upstream sectors:								
Fruits	-73	-0.1	-6	-0.1	-3	-0.1	-1	-0.1
Vegetables	-29	(⁴)	-4	(⁴)	-1	-0.1	(³)	(⁴)
Paperboard containers and boxes	-32	(⁴)	-7	(⁴)	(³)	(⁴)	(³)	(⁴)
Miscellaneous plastics products	-15	(⁴)	-2	(⁴)	-1	(⁴)	(³)	(⁴)
Metal foil and leaf	-20	-0.2	-5	-0.2	(³)	-0.2	(³)	-0.2
Motor freight transportation	-80	(⁴)	-7	(⁴)	(³)	(⁴)	(⁵)	(⁵)
Advertising	-9	(⁴)	-4	(⁴)	(³)	(⁴)	(³)	(⁴)
Downstream sectors:								
Restaurants	227	(⁴)	14	(⁴)	-2	(⁴)	6	(⁴)
Hospitals and nursing care facilities	26	(⁴)	2	(⁴)	(⁵)	(⁵)	(³)	(⁴)
Rest of the U.S. economy:								
Agriculture, forestry, and fisheries	104	(⁴)	14	(⁴)	-1	(⁴)	12	(⁴)
Mining	30	(⁴)	5	(⁴)	-1	(⁴)	1	(⁴)
Construction	5	(⁴)	(³)	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Nondurable manufacturing ..	96	(⁴)	15	(⁴)	-13	(⁴)	9	(⁴)
Durable manufacturing	581	(⁴)	89	(⁴)	-29	(⁴)	37	(⁴)
Transportation, communications, and utilities	91	(⁴)	15	(⁴)	-8	(⁴)	12	(⁴)
Wholesale and retail trade ..	-263	(⁴)	-19	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Finance, insurance, and real estate	-25	(⁴)	-13	(⁴)	-1	(⁴)	2	(⁴)
Other services	99	(⁴)	2	(⁴)	-4	(⁴)	9	(⁴)

¹ Full-time equivalent jobs.

² In millions of dollars in base year prices.

³ Change less than 1 million dollars.

⁴ Change less than one-tenth of 1 percent.

⁵ Nontradeable sector.

Source: Estimated by the staff of the USITC.

Table 43
Ceramic wall and floor tile: Summary data, 1989-91

(Million dollars, except where indicated)

Item	1989	1990	1991
Shipments	681.4	696.3	682.9
Employment (1,000 workers)	10.0	9.8	9.5
Imports	431.1	421.0	365.1
Exports	17.9	20.5	21.0

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

Economic Effects of Tariff Removal

The U.S. economy experiences a welfare gain of \$12 million from tariff removal in the ceramic wall and floor tile sector. A large contribution to this welfare gain is the 6.0 percent fall in the overall price of ceramic wall and floor tile experienced by consumers. Across the economy, net changes in output and employment are negligible. In addition, net imports fall by \$4 million, as net exports show no change.

Detailed economic effects of tariff removal in this sector are presented in table 44. Direct effects on this sector from lost tariff protection are a \$39 million fall in output and a loss of 362 jobs. Both figures represent approximately a 5-percent decline from original levels. Imports of ceramic wall and floor tile rise by \$41 million (over an 8-percent increase), whereas exports fall slightly.

Upstream sectors to ceramic wall and floor tile are affected adversely, although not substantially. Motor freight transportation suffers the largest loss with a \$5 million fall in output and 60 fewer jobs. Downstream sectors are not significantly affected by the tariff removal. Trade effects are negligible for the upstream sectors and not applicable to the downstream sectors, since they are nontradeables.

Personal Leather Goods

Current Tariff Status

This category includes small articles normally carried on the person or in a handbag, such as billfolds, key cases, and coin purses of leather or other materials, except of precious metal. Rates of duties on these articles currently range from 6.5 to 25 percent. Summary data for the personal leather goods sector are presented in table 45.

Economic Effects of Tariff Removal

The U.S. economy experiences a welfare gain of \$7 million from tariff removal in the personal leather goods sector. A large contribution to this welfare gain is the 2.5 percent fall in the overall price of personal leather goods experienced by consumers. Across the economy, net changes in output and employment are negligible. In addition, net imports increase by \$30 million, as net exports fall by \$6 million.

Detailed economic effects of tariff removal in this sector are presented in table 46. Direct effects on this sector from lost tariff protection are a decline in output of \$21 million and 145 fewer jobs. Both figures represent a decline of less than 3 percent from original levels. Imports increase \$30 million, representing over an 8-percent gain, whereas exports fall slightly by \$1 million, or by 2.4 percent. Upstream sectors are

affected only marginally, both experiencing losses of less than \$10 million. Likewise, the downstream sector, jewelry, experiences only marginal gains. Import and export effects for both upstream and downstream sectors are negligible.

Electronic Capacitors

Current Tariff Status

Capacitors are used in virtually all electronic products to block the flow of direct current, permit the flow of alternating current, and store electrical energy. Capacitors may be produced as discrete components and installed on printed circuit boards or other electronic devices, or they may be directly incorporated into an electronic circuit design. They are usually distinguished by their dielectric material and voltage rating. The tariff on U.S. imports of capacitors is 10.0 percent. Summary data for this sector are presented in table 47.

Economic Effects of Tariff Removal

The U.S. economy experiences a welfare gain of \$5 million from tariff removal in the electronic capacitors sector. A large contribution to this welfare gain is the 1.2 percent fall in the overall price of electronic capacitors experienced by consumers. Across the economy, liberalization also brings negligible gains in output and employment. In addition, net imports increase by \$95 million, as net exports gain by \$102 million.

Detailed economic effects of tariff removal in this sector are presented in table 48. Direct effects on this sector from lost tariff protection are a decline in output of \$192 million and 1,011 fewer jobs. Both figures represent a less than 1 percent decline from the original levels of output and employment in the sector. Imports increase \$172 million (1.7 percent), while exports fall \$42 million (0.5 percent).

Upstream sectors are affected adversely in general, but the effect is small. Plastics products, materials, and resins sector suffers the largest loss with just a \$11 million fall in output. The benefit to downstream sectors is larger, with both the television and radio equipment sector and the aircraft and missile sector experiencing over \$75 million increase in output and over 500 additional jobs each.

Liberalization of the electronic capacitors sector also improves the trade balance of downstream sectors. All downstream sectors experience export gains, as imports fall. The aircraft and missile sector experiences the largest export gain (\$64 million), whereas television and radio equipment imports fall the most (\$40 million).

Table 44
Ceramic wall and floor tile: Economic effects of tariff removal, 1991

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
Liberalized sector:								
Ceramic wall and floor tile	-362	-5.3	-39	-5.3	41	8.3	-1	-5.3
Upstream sectors:								
Industrial organic and inorganic chemicals	-8	(4)	-3	(4)	-1	(4)	(3)	(4)
Utilities	-8	(4)	-3	(4)	(3)	(4)	(3)	(4)
Motor freight transportation	-60	(4)	-5	(4)	(3)	(4)	(5)	(5)
Downstream sectors:								
New residential construction	(3)	(4)	(3)	(4)	(5)	(5)	(5)	(5)
New industrial and commercial construction	(3)	(4)	(3)	(4)	(5)	(5)	(5)	(5)
New farm construction	(3)	(4)	(3)	(4)	(5)	(5)	(5)	(5)
Maintenance and repairs	-6	(4)	-1	(4)	(5)	(5)	(5)	(5)
Rest of the U.S. economy:								
Agriculture, forestry, and fisheries	36	(4)	5	(4)	(3)	(4)	3	(4)
Mining	3	(4)	(3)	(4)	(3)	(4)	(3)	(4)
Construction	1	(4)	(3)	(4)	(5)	(5)	(5)	(5)
Nondurable manufacturing ..	44	(4)	7	(4)	-3	(4)	2	(4)
Durable manufacturing	158	(4)	24	(4)	-7	(4)	9	(4)
Transportation, communications, and utilities	40	(4)	5	(4)	-2	(4)	4	(4)
Wholesale and retail trade	26	(4)	1	(4)	(5)	(5)	(5)	(5)
Finance, insurance, and real estate	27	(4)	4	(4)	(3)	(4)	1	(4)
Other services	106	(4)	5	(4)	-1	(4)	3	(4)

¹ Full-time equivalent jobs.

² In millions of dollars in base year prices.

³ Change less than 1 million dollars.

⁴ Change less than one-tenth of 1 percent.

⁵ Nontradeable sector.

Source: Estimated by the staff of the USITC.

Table 45
Personal leather goods: Summary data, 1989-91

(Million dollars, except where indicated)

Item	1989	1990	1991
Shipments	388.3	378.8	375.3
Employment (1,000 workers)	6.9	6.5	6.4
Imports	264.4	273.8	291.7
Exports	11.5	17.8	21.3

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

Table 46
Personal leather goods: Economic effects of tariff removal, 1991

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
Liberalized sector:								
Personal leather goods	-145	-2.4	-21	-2.4	30	8.8	-1	-2.4
Upstream sectors:								
Miscellaneous plastics products, materials, and resins	-6	(⁴)	-1	(⁴)	(³)	(⁴)	(³)	(⁴)
Leather tanning and finishing	-41	-0.3	-8	-0.3	-1	-0.2	-2	-0.3
Downstream sectors:								
Jewelry	32	(⁴)	4	(⁴)	(³)	(⁴)	1	(⁴)
Rest of the U.S. economy:								
Agriculture, forestry, and fisheries	23	(⁴)	3	(⁴)	(³)	(⁴)	2	(⁴)
Mining	5	(⁴)	1	(⁴)	(³)	(⁴)	(³)	(⁴)
Construction	2	(⁴)	(³)	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Nondurable manufacturing	-2	(⁴)	-2	(⁴)	-3	(⁴)	1	(⁴)
Durable manufacturing	121	(⁴)	18	(⁴)	-5	(⁴)	7	(⁴)
Transportation, communications, and utilities	26	(⁴)	3	(⁴)	-2	(⁴)	2	(⁴)
Wholesale and retail trade	11	(⁴)	(³)	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Finance, insurance, and real estate	-2	(⁴)	-3	(⁴)	(³)	(⁴)	(³)	(⁴)
Other services	7	(⁴)	(³)	(⁴)	-1	(⁴)	2	(⁴)

- ¹ Full-time equivalent jobs.
- ² In millions of dollars in base year prices
- ³ Change less than 1 million dollars.
- ⁴ Change less than one-tenth of one percent.
- ⁵ Nontradeable sector.

Source: Estimated by the staff of the USITC.

Table 47
Electronic capacitors: Summary data, 1989-91
(Million dollars, except where indicated)

Item	1989	1990	1991
Shipments	1,430.7	1,322.1	1,373.3
Employment (<i>1,000 workers</i>)	21.4	19.5	18.5
Imports	537.8	530.1	542.0
Exports	481.5	504.2	568.7

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

Table 48
Electronic capacitors: Economic effects of tariff removal, 1991

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
Liberalized sector:								
Electronic capacitors	-1,011	-0.6	-192	-0.6	172	1.7	-42	-0.5
Upstream sectors:								
Nonferrous wire rolling and drawing	-4	(⁴)	-1	(⁴)	(³)	(⁴)	(³)	(⁴)
Miscellaneous plastics products, materials, and resins	-68	(⁴)	-11	(⁴)	-1	(⁴)	-1	(⁴)
Downstream sectors:								
Electrical computing equipment	301	0.1	33	0.1	-10	(⁴)	18	0.1
Telephone and telegraph apparatus	76	0.1	9	0.1	-3	-0.1	5	0.2
Television and radio equipment	658	0.1	79	0.1	-40	-0.2	23	0.3
Semiconductors	467	0.2	45	0.2	-13	-0.1	30	0.2
Aircraft and missile equipment	533	0.1	78	0.1	-3	(⁴)	64	0.1
Engineering and scientific equipment	100	(⁴)	20	(⁴)	-3	-0.1	4	0.1
Rest of the U.S. economy:								
Agriculture, forestry, and fisheries	-57	(⁴)	-7	(⁴)	(³)	(⁴)	-4	(⁴)
Mining	-15	(⁴)	-2	(⁴)	(³)	(⁴)	(³)	(⁴)
Construction	-18	(⁴)	-2	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Nondurable manufacturing	-123	(⁴)	-20	(⁴)	1	(⁴)	-3	(⁴)
Durable manufacturing	354	(⁴)	58	(⁴)	-6	(⁴)	14	(⁴)
Transportation, communications, and utilities	-69	(⁴)	-9	(⁴)	1	(⁴)	-3	(⁴)
Wholesale and retail trade	-254	(⁴)	-14	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Finance, insurance, and real estate	-147	(⁴)	-26	(⁴)	(³)	(⁴)	-1	(⁴)
Other services	-401	(⁴)	-19	(⁴)	(³)	(⁴)	-2	(⁴)

- ¹ Full-time equivalent jobs.
- ² In millions of dollars in base year prices.
- ³ Change less than 1 million dollars.
- ⁴ Change less than one-tenth of 1 percent.
- ⁵ Nontradeable sector.

Source: Estimated by the staff of the USITC.

Leather Gloves and Mittens

Current Tariff Status

For tariff purposes, leather gloves have historically been distinguished between those of horsehide or cowhide leather and those of other leathers. Horsehide and cowhide leather is used mostly to produce work gloves, whereas other leathers, such as sheepskin, are used mainly to make dress gloves. Developments over the years have tended to blur these distinctions somewhat. The tariff distinction based on leather types was eliminated with the adoption of the HTS in 1989. The HTS now classifies dress and work gloves of all types of leather under a single subheading with a tariff

rate of 14 percent. Summary data for this sector are presented in table 49.

Economic Effects of Tariff Removal

The U.S. economy experiences a welfare gain of \$2 million from tariff removal in the leather gloves and mittens sector. A large contribution to this welfare gain is the 4.5 percent fall in the overall price of leather gloves and mittens experienced by consumers. Across the economy, net changes in output and employment are negligible. In addition, net imports increase by \$17 million, as net exports fall by \$4 million.

Detailed economic effects of tariff removal in this sector are presented in table 50. Removal of the tariff in this sector leads to an increase of imports by

Table 49
Leather gloves and mittens: Summary data, 1989-91
(Million dollars, except where indicated)

Item	1989	1990	1991
Shipments	116.6	113.0	127.0
Employment (1,000 workers)	2.4	2.8	2.5
Imports	170.4	181.2	157.5
Exports	11.5	14.0	13.1

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

Table 50
Leather gloves and mittens: Economic effects of tariff removal, 1991

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
Liberalized sector:								
Leather gloves and mittens	-49	-3.7	-9	-3.7	15	12.5	(³)	-2.9
Upstream sectors:								
Fabric, yarn, and thread mills	-8	(⁴)	-1	(⁴)	(³)	(⁴)	(³)	(⁴)
Leather tanning and finishing	-22	-0.1	-4	-0.1	-1	-0.1	-1	-0.1
Rest of the U.S. economy:								
Agriculture, forestry, and fisheries	11	(⁴)	1	(⁴)	(³)	(⁴)	1	(⁴)
Mining	2	(⁴)	(³)	(⁴)	(³)	(⁴)	(³)	(⁴)
Construction	1	(⁴)	(³)	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Nondurable manufacturing ..	(³)	(⁴)	-1	(⁴)	-1	(⁴)	-1	(⁴)
Durable manufacturing	57	(⁴)	9	(⁴)	-3	(⁴)	4	(⁴)
Transportation, communications, and utilities	12	(⁴)	2	(⁴)	-1	(⁴)	1	(⁴)
Wholesale and retail trade	-9	(⁴)	-1	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Finance, insurance, and real estate	-2	(⁴)	-1	(⁴)	(³)	(⁴)	(³)	(⁴)
Other services	23	(⁴)	1	(⁴)	-1	(⁴)	1	(⁴)

¹ Full-time equivalent jobs.

² In millions of dollars in base year prices.

³ Change less than 1 million dollars.

⁴ Change less than one-tenth of 1 percent.

⁵ Nontradeable sector.

Source: Estimated by the staff of the USITC.

\$15 million, or by 12.5 percent. Lower prices from lost protection lead to an output loss of \$9 million and 49 fewer jobs. Both figures represent a decline of almost 4 percent. The effect on exports in the liberalized sector are negligible.

Both upstream sectors are affected adversely by liberalization, but the losses are small, with output declines of less than \$5 million. No industrial downstream sectors are identified for leather gloves and mittens since the products are sold mainly at the retail level.

China Tableware

Current Tariff Status

This category includes household and commercial chinaware, including bone chinaware. Under the HTS, the current tariff duties on china tableware range from 8 to 35 percent. All HTS subheadings are eligible for duty-free treatment for imports entering from designated CBERA and Andean countries and Israel. Six of the 10 HTS subheadings are also eligible for

GSP treatment. Under the CFTA, U.S. imports from Canada enter at tariffs ranging from free to 13 percent. Summary data for this sector are presented in table 51.

addition, net imports increase by \$35 million, as net exports gain by \$18 million.

Economic Effects of Tariff Removal

The U.S. economy experiences a welfare gain of \$2 million from tariff removal in the china tableware sector. A large contribution to this welfare gain is the 6.5 percent fall in the overall price of china tableware experienced by consumers. Across the economy, net changes in output and employment are negligible. In

Detailed economic effects of tariff removal in this sector are presented in table 52. Direct effects on this sector from lost tariff protection are a \$26 million fall in output and almost 400 fewer jobs. Both figures represent over an 8-percent decline from original levels. Imports rise \$31 million (or by 8 percent), and exports fall by \$4 million (or by 7.9 percent). Output and trade effects for the upstream and downstream sectors are essentially negligible.

Table 51
China tableware: Summary data, 1989-91

(Million dollars, except where indicated)

Item	1989	1990	1991
Shipments	318.4	331.8	341.9
Employment (1,000 workers)	6.0	6.0	6.0
Imports	254.0	273.3	290.1
Exports	30.3	30.7	43.0

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

Table 52
China tableware: Economic effects of tariff removal, 1991

Sector	Employment		Output		Imports		Exports	
	Number ¹	Percent	Dollar ²	Percent	Dollar ²	Percent	Dollar ²	Percent
Liberalized sector:								
China tableware	-397	-8.1	-26	-8.1	31	8.7	-4	-7.9
Upstream sector:								
Motor freight transportation	-27	(⁴)	-2	(⁴)	(³)	(⁴)	(⁵)	(⁵)
Downstream sectors:								
Restaurants	126	(⁴)	8	(⁴)	-1	(⁴)	2	(⁴)
Nursing care facilities	11	(⁴)	1	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Rest of the U.S. economy:								
Agriculture, forestry, and fisheries	33	(⁴)	4	(⁴)	(³)	(⁴)	3	(⁴)
Mining	8	(⁴)	1	(⁴)	(³)	(⁴)	(³)	(⁴)
Construction	-6	(⁴)	-1	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Nondurable manufacturing ..	56	(⁴)	9	(⁴)	-2	(⁴)	2	(⁴)
Durable manufacturing	118	(⁴)	18	(⁴)	-6	(⁴)	7	(⁴)
Transportation, communications, and utilities	23	(⁴)	3	(⁴)	-2	(⁴)	2	(⁴)
Wholesale and retail trade	29	(⁴)	1	(⁴)	(⁵)	(⁵)	(⁵)	(⁵)
Finance, insurance, and real estate	16	(⁴)	1	(⁴)	(³)	(⁴)	(³)	(⁴)
Other services	46	(⁴)	1	(⁴)	-1	(⁴)	2	(⁴)

¹ Full-time equivalent jobs.

² In millions of dollars in base year prices.

³ Change less than 1 million dollars.

⁴ Change less than one-tenth of 1 percent.

⁵ Nontradeable sector.

Source: Estimated by the staff of the USITC.

Summary of High Tariff Liberalization Results

Economic welfare results for liberalization of each sector in this chapter are given in table 53 from largest to smallest. The largest gains from tariff removal occur in the nonrubber footwear and in the watches, clocks, and parts sectors, with welfare gains of \$170 and \$101 million, respectively. The largest welfare gains do not necessarily correspond to the sectors with the highest tariff rates. For example, liberalization of

the nonrubber footwear sector, which has the largest import volume of the sectors analyzed in this chapter (over \$6.7 billion in 1991), would benefit the consumers the most. Liberalization of the china tableware and the leather gloves and mittens sectors, which have a smaller import volume, results in only a \$2 million welfare gain, despite the relatively high tariff rates applied to these sectors. Thus, welfare gains from the removal of tariff protection depend not only on the level of the tariff, but also on a number of factors such as the volume of imports, size of the overall sector, and liberalization's effect on macroeconomic variables.

Table 53
Economic welfare change from liberalization, by sector, 1991

(Million dollars)

Sector	Economic welfare change
Nonrubber footwear	170
Watches, clocks, and parts	101
Ball and roller bearings, and parts	45
Pressed and blown glass, n.e.c.	44
Costume jewelry and costume novelties	42
Cyclic organic crudes and intermediates	24
Frozen fruit, fruit juices, and vegetables	13
Ceramic wall and floor tile	12
Personal leather goods	7
Electronic capacitors	5
Leather gloves and mittens	2
China tableware	2

Source: Estimated by the staff of the USITC.

APPENDIX A
REQUEST LETTER



THE UNITED STATES TRADE REPRESENTATIVE
Executive Office of the President
Washington, D.C. 20506

MAY 15 1992

The Honorable Donald E. Newquist
Chairman
U.S. International Trade Commission
500 E Street, S.W.
Washington, D.C. 20436

Dear Mr. Chairman,

The Commission's recent series of reports on the economic effects of significant U.S. import restraints (USITC publication 2222, dated October 1989; publication 2314, dated September 1990; and publication 2422, dated September 1991), prepared pursuant to a request from the Senate Committee on Finance dated September 12, 1988, has been an excellent source of objective, balanced information for the entire trade policy community. An understanding and appreciation of the economic implications of restraints imposed on trade are critical to any informed assessment of the trade policy options that confront the President and the Congress.

We would find it useful to have periodic updates of the types of assessments that the Commission has provided in its reports for the Finance Committee. Therefore, under authority delegated by the President and pursuant to section 332(g) of the Tariff Act of 1930, as amended, I request that the Commission periodically provide an updated assessment of the economic effects of significant U.S. import restraints. Each updating report should include quantitative assessments of the restraints' effects on U.S. consumers, on the activities of U.S. firms, on the income and employment of U.S. workers, and on the net economic welfare of the United States. The reports also should continue the broad analytical frameworks used in the original reports, namely partial equilibrium frameworks for the analysis of liberalization in individual sectors and a general equilibrium framework for assessment of the economy-wide effects of the simultaneous liberalization of all sectors covered.

With the exceptions noted below, the reports should consider the effects of all significant restraints on U.S. imports of goods and services whether they result from an act of Congress, an action taken under the fair trade laws of the United States (such as section 201 investigations), an international agreement, or voluntary export restraints by foreign nations. The reports should not include import restraints resulting from final

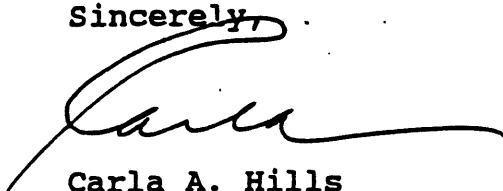
antidumping or countervailing duty investigations, section 337 or 406 investigations, or section 301 actions.

I would appreciate receiving the first updating report 18 months after receipt of this request. Subsequent reports should be provided thereafter at intervals of approximately two years until otherwise instructed.

In view of the outstanding instruction to the Commission on the security classification of reports prepared by the Commission at the request of the U.S. Trade Representative, I request that all reports on this investigation be made available to the public at the same time they are submitted to my office.

The Commission's assistance in this matter is greatly appreciated.

Sincerely,

A handwritten signature in black ink, appearing to read 'Carla', with a long horizontal flourish extending to the right.

Carla A. Hills

APPENDIX B
FEDERAL REGISTER NOTICE

scoping process. The general types of options identified to date include institutional changes, collection and treatment, disposal, dilution, source control, and a no action alternative (required under NEPA).

A preferred plan including NEPA compliance will be available for review and comment in 1994.

Dated: June 10, 1992.

Joe D. Hall,

Deputy Commissioner.

[FR Doc. 92-14056 Filed 6-16-92; 8:45 am]

BILLING CODE 4310-00-M

INTERNATIONAL TRADE COMMISSION

[Investigation No. 731-TA-556 (Preliminary)]

Dynamic Random Access Memories of One Megabit and Above From the Republic of Korea

Determination

On the basis of the record¹ developed in the subject investigation, the Commission determines, pursuant to section 733(a) of the Tariff Act of 1930 (19 U.S.C. 1673b(a)), that there is a reasonable indication that an industry in the United States is materially injured by reason of imports from the Republic of Korea (Korea) of dynamic random access memories (DRAMs) of one megabit (Meg) and above,² provided for in subheadings 8473.30.40 and 8542.11.00 of the Harmonized Tariff Schedule of the United States, that are alleged to be sold in the United States at less than fair value (LTFV).

¹ The record is defined in § 207.2(f) of the Commission's Rules of Practice and Procedure (19 CFR 207.2(f)).

² For purposes of Commerce's investigation, DRAMs include all 1 Meg and above dynamic random access memory semiconductors, whether assembled or unassembled. Assembled DRAMs include all package types. Unassembled DRAMs include processed wafers, uncut dice, and cut dice. Processed wafers produced in Korea but packaged in a third country are included in the scope; however, wafers produced in a third country and assembled or packaged in Korea are not included in the scope. The scope also includes memory modules, such as single in-line processing modules (SIPs) and single in-line memory modules (SIMMs), that contain 1 Meg or above dynamic random access memory semiconductors that are assembled together and function as memory. Modules that contain other parts that are needed to support the function of memory are considered to be covered memory modules. Only those modules containing additional items which alter the function of the module to something other than memory are not covered modules. The scope also includes video random access memories (VRAMs), as well as any future packaging and assembling of DRAMs.

Background

On April 22, 1992, a petition was filed with the Commission and the Department of Commerce by Micron Technology, Inc., Boise, ID, alleging that an industry in the United States is materially injured and is threatened with material injury by reason of LTFV imports of DRAMs of one Meg and above from Korea. Accordingly, effective April 22, 1992, the Commission instituted antidumping investigation No. 731-TA-556 (Preliminary).

Notice of the institution of the Commission's investigation and of a public conference to be held in connection therewith was given by posting copies of the notice in the Office of the Secretary, U.S. International Trade Commission, Washington, DC, and by publishing the notice in the Federal Register of April 29, 1992 (57 FR 18163). The conference was held in Washington, DC, on May 13, 1992, and all persons who requested the opportunity were permitted to appear in person or by counsel.

The Commission transmitted its determination in this investigation to the Secretary of Commerce on June 8, 1992. The views of the Commission are contained in USITC Publication 2519 (June 1992), entitled "Dynamic Random Access Memories of One Megabit and Above from the Republic of Korea: Determination of the Commission in Investigation No. 731-TA-556 (Preliminary) Under the Tariff Act of 1930, Together With the Information Obtained in the Investigation."

Issued: June 9, 1992.

By order of the Commission.

Kenneth R. Mason,

Secretary.

[FR Doc. 92-14203 Filed 6-16-92; 8:45 am]

BILLING CODE 7020-02-M

[Investigation No. 332-325]

The Economic Effects of Significant U.S. Import Restraints

AGENCY: United States International Trade Commission.

ACTION: Institution of investigation.

SUMMARY: Following receipt on May 15, 1992 of a request from the U.S. Trade Representative (USTR), the Commission instituted investigation No. 332-325 on the economic effects of significant U.S. import restraints, under section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1332(g)). As requested, the investigation will assess the economic effects of significant U.S. import restraints on U.S. consumers, on the activities of U.S.

firms, on the income and employment of U.S. workers, and on the net economic welfare of the United States. The investigation will not include import restraints resulting from final antidumping or countervailing duty investigations, section 337 or 406 investigations, or section 301 actions.

The Commission will provide an initial report on this investigation by November 15, 1993. Subsequent reports will be provided every two years. Copies of Commission reports on this subject will be made available to the public at the same time they are provided to the USTR.

EFFECTIVE DATE: June 5, 1992

Public Hearing

A public hearing in connection with this investigation will be held in the Commission Hearing Room, 500 E Street, SW., Washington, DC 20436, beginning at 9:30 a.m. on October 14, 1992. All persons shall have the right to appear by counsel or in person, to present information, and to be heard. Requests to appear at the public hearing should be filed with the Secretary, United States International Trade Commission, 500 E Street, SW., Washington, DC 20436, no later than noon, October 2, 1992. The deadline for filing prehearing briefs (original and 14 copies) is October 2, 1992. Dates for public hearings in connection with future phases of this investigation will be announced later.

Written Submissions

Interested persons are invited to submit written statements concerning the matters to be addressed in the report. Commercial or financial information that a party desires the Commission to treat as confidential must be submitted on separate sheets of paper, each clearly marked "Confidential Business Information" at the top. If confidential treatment is desired, submission of separate confidential and public versions is required. All submissions requesting confidential treatment must conform with the requirements of § 201.6 of the Commission's Rules of Practice and Procedure (19 CFR 201.6). All written submissions, except for confidential business information, will be made available in the Office of the Secretary to the Commission for inspection by interested person.

FOR FURTHER INFORMATION CONTACT: Joseph Francois or Joseph Flynn (202-205-3223), Office of Economics, U.S. International Trade Commission.

Hearing impaired persons are advised that information on this investigation can be obtained by contacting the

Commission's TDD terminal on 202-205-1810. Issued: June 10, 1992.Q02

By order of the Commission.

Kenneth R. Mason,

Secretary.

[FR Doc. 92-14201 Filed 6-16-92; 8:45 am]

BILLING CODE 7020-02-M

[Investigation No. 303-TA-22 (Final)]

Extruded Rubber Thread From Malaysia

AGENCY: United States International Trade Commission.

ACTION: Notice of discontinuation of investigation.

SUMMARY: On August 29, 1991, the North American Rubber Thread Company filed a petition with the Commission and the U.S. Department of Commerce seeking the imposition of countervailing duties on imports of extruded rubber thread from Malaysia. Although Malaysia is not a "country under the Agreement" within the meaning of section 701(b) of the Tariff Act of 1930 (the Act), extruded rubber thread from Malaysia was nondutiable under the Generalized System of Preferences (GSP), and Malaysia is a contracting party of the General Agreement on Tariffs and Trade. Therefore, the U.S. International Trade Commission instituted preliminary countervailing duty investigation No. 303-TA-22 (Preliminary) (56 FR 43938, September 5, 1991) under section 303(a) of the Act and determined that there is a reasonable indication that an industry in the United States is materially injured by reason of the subject imports. Following an affirmative preliminary determination by Commerce, the U.S. International Trade Commission instituted final countervailing duty investigation No. 303-TA-22 (Final) (57 FR 4479, February 5, 1992).

On March 12, 1992, the President of the United States determined that it was appropriate to withdraw the duty-free treatment afforded under the GSP to imports from Malaysia of extruded rubber thread (57 FR 9041, March 16, 1992). Therefore, Malaysia is no longer entitled to an injury determination under section 303 of the Act with regard to the countervailing duty investigation that has been initiated by the Department of Commerce on extruded rubber thread. Accordingly, the Commission gives notice that its countervailing duty investigation concerning extruded rubber thread from Malaysia (investigation No. 303-TA-22 (Final)) is discontinued.

EFFECTIVE DATE: June 9, 1992.

FOR FURTHER INFORMATION CONTACT: Debra Baker (202-205-3180), Office of Investigations, U.S. International Trade Commission, 500 E Street SW., Washington, DC 20436. Hearing-impaired individuals are advised that information on this matter can be obtained by contacting the Commission's TDD terminal on 202-205-1810. Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at 202-205-2000.

Authority: This action is taken under authority of the Tariff Act of 1930, section 303 and title VII.

Issued: June 10, 1992.

By order of the Commission.

Kenneth R. Mason,

Secretary.

[FR Doc. 92-14200 Filed 6-16-92; 8:45am]

BILLING CODE 7020-02-M

[Investigation No. 731-TA-572 (Preliminary)]

Certain Special Quality Carbon and Alloy Hot-Rolled Steel Bars and Rods and Semifinished Products Thereof From Brazil

AGENCY: United States International Trade Commission.

ACTION: Institution and scheduling of preliminary antidumping investigation.

SUMMARY: The Commission hereby gives notice of the institution of preliminary antidumping investigation No. 731-TA-572 (Preliminary) under section 733(a) of the Tariff Act of 1930 (19 U.S.C. 1673b(a)) to determine whether there is a reasonable indication that an industry in the United States is materially injured, or is threatened with material injury, or the establishment of an industry in the United States is materially retarded, by reason of imports from Brazil of certain special quality carbon and alloy hot-rolled steel bars and rods, and semifinished products thereof¹ covered by

¹ For purposes of this investigation, the subject imports consist of certain special quality carbon (nonalloy) steel and alloy steel (other than stainless steel, high-speed steel, silico-manganese steel, and tool steel) semifinished products and hot-rolled bars and rods. The subject imports are semifinished and hot-rolled products that may have been subjected to direct hardening, carburizing, induction hardening, and nitriding, and exhibit creep resistance; and are used in applications requiring critical levels of hardness and/or hardenability, strength, toughness, fatigue resistance, high-temperature creep and fracture resistance, wear resistance, machinability, and formability. The imports subject to investigation include products that are produced from the following grades of steel: AISI carbon series 1000 (excluding grades 1000 through 1044 designated with the prefix M), 1100, 1200, and 1500; AISI certain alloy series 1300, 4000, 4100, 4300, 4600,

subheadings/statistical reporting numbers 7207.11.00, 7207.12.0010, 7207.19.0030, 7207.20.0025, 7207.20.0075, 7214.30.00, 7214.40.00, 7214.50.00, 7214.60.00, 7224.10.0075, 7224.90.0045, 7224.90.0065, and 7228.30.80 of the Harmonized Tariff Schedule of the United States, that are alleged to be sold in the United States at less than fair value.

As provided in section 733(a) of the Tariff Act, the Commission must complete its preliminary antidumping investigation in 45 days, or in this case by July 24, 1992.

For further information concerning the conduct of this investigation and rules of general application, consult the Commission's Rules of Practice and Procedure, part 201, subparts A through E (19 CFR part 201), and part 207, subparts A and B (19 CFR part 207).

EFFECTIVE DATE: June 9, 1992.

FOR FURTHER INFORMATION CONTACT: Diane J. Mazur (202-205-3184), Office of Investigations, U.S. International Trade Commission, 500 E Street SW., Washington, DC 20436. Hearing-impaired persons can obtain information on this matter by contacting the Commission's TDD terminal on 202-205-1810. Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at 202-205-2000.

SUPPLEMENTARY INFORMATION:

Background

This investigation is being instituted in response to a petition filed on June 9, 1992, by Republic Engineered Steels, Inc., Massillon, OH, and The Timken Company, Canton, OH.

Participation in the Investigation and Public Service List.

Persons (other than petitioners) wishing to participate in this investigation as parties must file an

4700, 4800, 5000, 5100, 5200, 6100, 6100, 6600, 6700, 6800, 6200, 6300 and 6400; and the grades for both carbon and certain alloy include Boron and H-steels. The subject imports of hot-rolled bars and rods are in cut lengths and various shapes and sizes. The subject imports of semifinished products include cast certain alloy steel ingots and strand castings, and semi-wrought ingots and strand castings; and nonalloy and certain alloy steel rolled or forged blooms, billets, and slabs for forging, if destined for use in the subject hot-rolled bars and rods. Excluded from the scope of the investigation are imports of semifinished products or hot-rolled bars and rods which contain by weight 0.05 percent or more of lead or 0.06 percent or more of bismuth; nonalloy steel ingots or other primary forms; semifinished or hot-rolled products of merchant quality steels (AISI grades M 1000 through M 1044); hot-rolled bars and rods in coiled form; forged bars; and reinforcing bars and rods.

APPENDIX C
CALENDAR OF PUBLIC HEARING

Calendar of Public Hearing

Those listed below appeared as witnesses at the United States International Trade Commission's hearing:

Subject: THE ECONOMIC EFFECTS OF SIGNIFICANT
U.S. IMPORT RESTRAINTS

Inv. No.: 332-325

Date and Time: October 14, 1992 - 9:30 a.m.

Sessions were held in connection with the investigation in the Main Hearing Room 101 of the United States International Trade Commission, 500 E Street, S.W., Washington, D.C.

ORGANIZATION AND WITNESS:

Howery & Simon
Washington, D.C.
On behalf of

The Australian Meat and Livestock Corporation,
Government of Australia

Dr. Bruce Standen, Managing Director

J. B. Penn, Senior Vice President
Sparks Companies, Inc.

Katherine D. McManus)—OF COUNSEL

Citizens for a Sound Economy Foundation
Washington, D.C.

Daniel Oliver, Distinguished Fellow

American International Automobile Dealers Association

Walter E. Huizenga, President



APPENDIX D
THE USITC CGE MODEL

The USITC CGE Model

This appendix provides a technical description of the USITC CGE model, including an overview of how it works, current model specification, and discussion of how it analyzes significant import restraints.

Overview of How the USITC CGE Model Works

Computable general equilibrium models, such as the USITC CGE model, simulate interactions among producers and consumers within an economy in markets for goods, services, labor, and physical capital. The distinguishing feature of a CGE model is its economywide coverage and multisectoral nature. A CGE model explicitly accounts for upstream and downstream production linkages, intersectoral competition for labor and capital, and exchange rate changes. A growing body of evidence suggests that these indirect effects of import restraints can be important.

The USITC CGE model has three main components: 1) a social accounting matrix (SAM), 2) a behavioral parameter data set, and 3) a system of equations that constitute the model specification. The SAM is the empirical foundation of the CGE that specifies the transactions between the various economic units involved in the U.S. economy for the base year in this study, 1991. The majority of the SAM is composed of the estimated input-output accounts for 487 sectors in agriculture, mining, manufacturing, and services, which detail the transactions that occur between industrial sectors, such as the purchase of steel by the automotive sector.¹⁴⁸ In addition to these input-output accounts that capture interindustry linkages, other information such as trade data, government transactions, and household transactions are incorporated into the SAM and are reconciled with the national income and product accounts (NIPA). By this process, a consistent set of detailed transactions between firms, households, government, and other domestic and foreign institutions are generated for the base year, 1991.

While the SAM provides information on the initial equilibrium of the U.S. economy, the behavioral parameters help the model determine how the economy moves from this equilibrium in response to changes in policy parameters. Each behavioral parameter is an elasticity that specifies the percentage change in an economic variable in response to a one percent change in another economic variable. For example, an income elasticity of demand is the percentage change in demand that occurs in response to a one percent change in household income. The following types of behavioral parameters are used by the model:

- 1) Elasticities of substitution between imported and domestic goods;
- 2) Elasticities of transformation between domestic and export goods;
- 3) Elasticities of import supply;
- 4) Elasticities of export demand;
- 5) Elasticities of substitution between labor and capital;
- 6) Elasticities of labor supply; and
- 7) Income elasticities.

These parameters have been estimated by the staff of the USITC where possible. In other cases, staff has relied on published studies for estimates. The parameters are collected into a behavioral parameter data set, which is continually improved and updated.¹⁴⁹

¹⁴⁸ This 487 sector classification is based on 6-digit Bureau of Economic Analysis sectors.

¹⁴⁹ This data set is described in more detail in Reinert and Roland-Holst, "Parameter estimates for U.S. Trade Policy," working paper, 1991.

The final component of the USITC CGE model is the system of equations that compose the model of the U.S. economy. These equations characterize production technology, labor market supply and demand, trade interactions, and domestic supply and demand of final and intermediate goods as functions of prices and quantities. Flexible functional forms that incorporate the behavioral parameters are used. As a final step, equations specifying the accounting identities that tie these interactions together are added to ensure model closure. A more detailed description of this important part of the CGE model is given in the next section.

Current Specification of the USITC CGE Model

The specification of the model is the system of equations that describe the economy. The USITC CGE model specification is divided into eight components: final demand behavior, production technology, factor supplies and demands, treatment of traded goods, domestic prices, domestic market equilibrium, the foreign sector, and income and government revenue. The following section describes the specification of these eight components necessary to model a simple one-sector version of the USITC CGE model. However, even the one-sector model contains more than one good. The model views each sector as consisting of three goods, where imports and exports in each sector are imperfect substitutes for their domestic counterparts. Imports combine with the domestic substitute to form a composite good, and domestic output is supplied to both the domestic market and the export market.

Final Demand Behavior

The USITC CGE model considers three separate components of domestic final demand: household consumption, government demand, and investment demand. The consumption behavior of households is given in equation 1:

$$c = \text{LES}(p_q, (1-s^*)Y; \eta) \quad (1)$$

where c denotes real personal consumption, p_q denotes the domestic price of the composite good, s^* is the fixed savings rate, Y is domestic income, and η is the income elasticity of demand. The functional form is that of the linear expenditure system (LES).¹⁵⁰ The LES is a generalization of the Cobb-Douglas utility function in which the origin is translated to a point in the positive quadrant. While the income expansion paths are linear, the displaced origin allows preferences to be nonhomothetic. That is, income elasticities of demand can differ from unity. This is an important feature of the model.

The specification of government demand can take two forms. In the first, we fix nominal government spending as follows:

$$p_q g = G^* \quad (2a)$$

where g is real government demand and G^* is exogenously specified, nominal government spending.

In the second, we fix real government spending:

$$g = g^* \quad (2b)$$

where g^* is the exogenously specified, real government spending.

For investment demand, we assume that real investment is held constant as in:

¹⁵⁰ For an introduction to the LES, see ch. 5 of Layard, P. R. G. and A. A. Walters, *Microeconomic Theory* (New York: McGraw-Hill, 1978), ch. 3 of Deaton, A. and J. Muellbauer, *Economics and Consumer Behavior* (Cambridge: Cambridge University Press, 1980), app. A.5 of Dervis, K., J. de Melo, and S. Robinson, *General Equilibrium Models for Development Policy* (Cambridge: Cambridge University Press, 1982), and ch. 11 of Silberberg, E., *The Structure of Economics* (New York: McGraw-Hill, 1990).

$$i = i^* \quad (3)$$

where i is real investment and i^* is its exogenously-specified level. This specification avoids questions concerning the substitution between present and future consumption, which would make static welfare comparisons difficult.

Production Technology

Production technology is modeled using a constant elasticity of substitution (CES) value added function specified as:¹⁵¹

$$x = \text{CES}(l_d, k_d; \phi) \quad (4)$$

where x denotes gross domestic output, l_d is labor demand, k_d is capital demand, and ϕ is the elasticity of substitution between labor and capital. The parameter ϕ is exogenous and is estimated outside of the model. A Leontief (fixed coefficients) function is assumed between value added and intermediate products as well as between various intermediates. Intermediate use is given by:

$$v = a x \quad (5)$$

where v is total intermediate use and a is the intermediate use coefficient. The coefficient a is determined by calibration to the social accounting matrix.

Factor Supplies and Demands

As generally is the case in CGE models, the factors of production, labor and capital, are often assumed to be in fixed supply. This assumption is specified in the following two equations:

$$l_s = l^* \quad (6a)$$

$$k_s = k^* \quad (7)$$

where l_s is the labor supply set equal to the exogenous level l^* and k_s is capital supply set equal to the exogenous level k^* .

Alternatively, the USITC model specifies the labor supply using a linear expenditure system as in de Melo and Tarr:¹⁵²

$$l_s = \text{LES}(w, p_q, (1-s^*)Y; \epsilon) \quad (6b)$$

where w is the wage and ϵ is the elasticity of labor supply.

Factor demands are derived from the CES production function and specify labor-capital shares that depend on relative factor prices and the elasticity of substitution as in:

$$\frac{l_d}{k_d} = \text{CES}(r, w; \phi) \quad (8)$$

where r is the rental rate on capital.

Treatment of Traded Goods

The treatment of traded goods is the most important component of the model specification. As mentioned in the introduction to this section, the model views each sector as consisting of three goods, where imports and exports in each industry category are imperfect substitutes for their domestic counterparts.¹⁵³ On the import side, the model treats foreign and domestic commodities as imperfect

¹⁵¹ For an introduction to CES production functions, see ch. 9 of Layard, P. R. G. and A. A. Walters, *Microeconomic Theory* (New York: McGraw-Hill, 1978), and ch. 9 of Silberberg, E., *The Structure of Economics* (New York: McGraw-Hill, 1990).

¹⁵² Jaime de Melo and David Tarr, *A General Equilibrium Analysis of U.S. Foreign Trade Policy* (Cambridge MA: The MIT Press, 1992).

¹⁵³ The treatment of traded goods follows de Melo, J. and S. Robinson, "Product Differentiation and the Treatment of Foreign Trade in Computable General Equilibrium Models of Small Economies," *Journal of International Economics*, vol. 27 (Aug. 1989), 489-97.

substitutes in domestic use. Therefore, the import composition of domestic demand is influenced by the ratio of domestic and import prices, and by any administrative quantity restrictions. The model aggregates imports and their domestic counterparts into an aggregate good q using a CES aggregation:

$$q = \text{CES}(d_d, m; \sigma) \quad (9)$$

$$\frac{d_d}{m} = \text{CES}(p_d, p_m; \sigma) \quad (10)$$

Equation 9 is the aggregation relation in which q denotes the composite good for domestic consumption, d_d denotes domestic demand for domestic goods, m denotes imports, and σ is the elasticity of substitution between imports and domestic goods within the sector.¹⁵⁴ Equation 10 is the tangency condition in which p_d is the price of domestic goods and p_m is the domestic price of imports.

The use of the CES functional form for aggregation implies that preferences with respect to imports and domestic goods within a sector are homothetic, while preferences between sectors are not. For a given level of demand for a product category, determined by the specification of the three components of final demand, the shares of imports and domestic goods are determined in response to relative prices.

On the export side, the model assumes that domestic firms allocate their output between domestic and foreign markets according to a transformation function which depends on the ratio of domestic and foreign prices. Therefore, the export composition of domestic supply is influenced by the ratio of domestic and export prices. The functional form used is a constant elasticity of transformation (CET) as indicated in the following equations:¹⁵⁵

$$x = \text{CET}(d_s, e; \tau) \quad (11)$$

$$\frac{d_s}{e} = \text{CET}(p_d, p_e; \tau) \quad (12)$$

Equation 11 is the allocation relation in which d_s is domestic supply, e is exports, and τ is the elasticity of transformation between domestic supply and exports. Equation 12 is the tangency condition in which p_e is the domestic price of exports. The shares of domestic supply and exports are determined in response to relative prices.

Domestic Prices

We next turn to the equations for domestic prices, including those of import and export goods. These are given in the following five equations:

$$p_x x = p_d d_s + p_e e \quad (13)$$

$$p_q q = p_d d_s + p_m m \quad (14)$$

$$p_m = (1 + t_m)(1 + \rho_m) n \pi_m \quad (15)$$

$$p_e = n \pi_e \quad (16)$$

where t_m is the tariff rate, ρ_m is the quota premium rate, π_m is the world price of the import good, π_e is the world price of the export good, and n is the exchange rate (U.S. dollars per unit of foreign currency).

¹⁵⁴ This is often referred to as the "Armington" elasticity, see Armington, P. S., "A Theory of Demand for Products Distinguished by Place of Production," *IMF Staff Papers*, vol. 16 (March 1969), 159-76.

¹⁵⁵ The original reference to this functional form is Powell, A. A. and F. Gruen, "The Constant Elasticity of Transformation Production Frontier and Linear Supply System," *International Economic Review*, vol. 9 (Oct. 1968), 315-28.

Domestic Market Equilibrium

Three equations are required for domestic market equilibrium, one for the commodity market and two others for the factor markets:

$$q = v + c + i + g \quad (17)$$

$$l_s = l_d \quad (18)$$

$$k_s = k_d \quad (19)$$

The Foreign Sector

We next need to characterize the foreign sector. We do so with the following three equations:

$$B^* = \pi_m m - \pi_e e \quad (20)$$

$$m = s_m(\pi_m; \sigma_f) \quad (21)$$

$$e = d_e(\pi_e; \tau_f) \quad (22)$$

where B^* is the exogenously-specified balance of payments or foreign saving, σ_f is the elasticity of import supply, and τ_f is the elasticity of export demand.

Income And Government Revenue

The national income identity is given as follows:

$$Y = w l_d + r k_d + n t_m m + n B^* \quad (23)$$

The income of the representative consumer includes wages, rental income, government revenue, plus foreign savings.

In the actual computer code of the model, private households, enterprises, and government are disaggregated into separate income and expenditure specifications, and a wider variety of fiscal instruments (e.g., income taxes and indirect business taxes) are included.

Import Restraint Analysis with the USITC CGE Model

In the application of the CGE methodology to import restraint removal, the following question is asked: What would happen to the economy if the import restraints were removed and all other U.S. policies (fiscal and monetary) as well as foreign conditions (economic behavior in foreign countries) remained the same? The analysis considers what *would have happened* to the U.S. economy in the base year (1991), if the import restraints were removed. The analysis thus emphasizes the effects of import restraints in isolation from other factors that effect the economy. Since the analysis does not incorporate expected future changes in these other factors, it is not a forecast. That is, the analysis does not tell what actually will happen if import restraints are removed. It does provide an assessment of the specific contributions of a policy change such as the removal of tariffs and quotas, however.

More technically, the model is first calibrated to the base-year data with the import restraints in place.¹⁵⁶ Correct calibration ensures that when the model solves for the equilibrium prices that equate supply and demand in all markets and satisfy the accounting identities governing economic behavior, it reproduces the base-year economy. The calibration process ensures that subsequent policy simulations start from an initial position that accurately describes the economy and its accounting identities.

¹⁵⁶ Tariffs are taken from official statistics compiled by the U.S. Department of Commerce, and the tariff equivalents of quotas are estimated by USITC staff.

With the calibration process complete, simulation of import restraint removal is accomplished by setting the specific tariff and/or the tariff-equivalent of the quotas to zero in the model, and solving the model for new equilibrium prices and quantities. By comparing these new equilibrium prices and quantities to the base solution, the model reports estimates of the economic effects of removing the specified import restraints.

Often the effects on the upstream and downstream sectors that are significantly linked with the liberalized sector are of interest as well.¹⁵⁷ Because of the multisectoral nature of the CGE, which explicitly details inter-industry linkages, analysis of the effects of import restraint removal on upstream and downstream sectors is straightforward. Through matrix procedures, the protected sector's expenditures on goods and services from the other 486 sectors can be extracted from the SAM. Large expenditures identify significant upstream sectors. Likewise, the vector of the protected sector's receipts from the other sectors can also be extracted from the SAM. The sectors that generate the largest receipts for the protected sector are significant downstream sectors.

Once the protected sector and its significant upstream and downstream sectors are identified for the policy simulation, the 487-sector SAM and behavioral parameter data set are manipulated into a more manageable size. This is done by using a flexible aggregation facility to combine the remaining sectors in the economy into nine broad reference sectors:

- 1) Agriculture, forestry, and fishing;
- 2) Mining;
- 3) Construction;
- 4) Nondurable manufacturing;
- 5) Durable manufacturing;
- 6) Transportation, communication, and utilities;
- 7) Wholesale and retail trade;
- 8) Finance, insurance, and real estate; and
- 9) Other services.

This procedure of aggregating the USITC SAM and behavioral parameter data set into the protected sector, the significant upstream and downstream sectors, and the nine reference sectors results in a manageable, sector-specific model from which to run policy simulations.

The main output of the USITC CGE model are the equilibrium prices and quantities that it computes in solving its system of equations. When a policy simulation is run, such as the removal of a specific import restraint, the model gives changes (both absolute and in percentage terms) in the equilibrium prices and quantities over those calculated in the base period.

Changes in macroeconomic variables specified in the model are reported as well. Some of the more important macroeconomic variables used in the model include the wage to capital rental ratio in the economy and the exchange rate. The changes in these macroeconomic variables due to the import restraint removal can have feedback effects on the sectors of interest, as well as the rest of the economy.

A final important output result calculated by the model is the equivalent variation economic welfare change from liberalization. The equivalent variation measures the amount of income that would have to be given to the household sector in the absence of liberalization to reach the level of overall economic welfare achievable under liberalization. A positive equivalent variation measure is the estimated total dollar amount U.S. households gain from removal of the tariff protection in a particular sector. This measure is the model's main indicator of net economic welfare change.¹⁵⁸

¹⁵⁷ Upstream sectors produce goods and services that serve as inputs into the production of goods and services in the protected sector; downstream sectors use the protected sector's goods and services as inputs.

¹⁵⁸ Even though the equivalent variation measure only evaluates domestic welfare in terms of aggregate private real consumption, it is appropriate for this model since government spending and investment are assumed fixed and thus generate no welfare changes.

APPENDIX E
MULTIFIBER ARRANGEMENT:
TARIFF EQUIVALENTS
AND CONCORDANCE

Multifiber Arrangement: Tariff Equivalents and Concordance

Estimation of Ad Valorem Tariff Equivalents

This analysis uses quota auction prices and available trade data as the basis on which to estimate the tariff equivalents of the Multifiber Arrangement (MFA) quotas. The method used here is, in some respects, similar to the price-gap method described in other chapters. However, because virtually all of the major importing countries participate in the MFA, world prices or third country prices that are not distorted by MFA quotas are not available.¹⁵⁹ In addition, foreign country export prices are not available. Consequently, we could not directly calculate the price gaps associated with the MFA quotas.

It is possible to estimate foreign country export prices by using available quota auction prices and U.S. import data reported on a customs value basis. For products not restricted by quantitative limits, we assume that U.S. import prices are roughly equivalent to foreign country export prices.¹⁶⁰ For products restricted by quotas, the U.S. import price represents the foreign country export price plus the quota rent (i.e., the value of the quota rights). Assuming that the prices of openly traded quotas reflect the value of the quota rents we have the following:

$$P^e = P^{cv} - QP$$

where P^e is the foreign country export price, P^{cv} is the U.S. import price, and QP is the quota price. From this we can calculate the estimated tariff equivalent (e) for a particular quota as follows:

$$e = (P^{cv} / P^e) - 1.$$

In the United States, MFA quotas are generally negotiated on a bilateral, quota category basis. The quota categories constitute a separate import classification system that is based on fiber content and type of product. The allocation of quotas (i.e., export rights) is administered by the respective foreign governments. With the exception of Hong Kong, these governments generally have not allowed quota holders to openly trade quotas.¹⁶¹ Quota recipients in Hong Kong are able to trade quotas (or portions of quotas) through private brokers.

In this analysis, average Hong Kong quota prices for 1991 were calculated based on weekly quota prices for the entire year.¹⁶² These prices were used to calculate the estimated export prices and ad

¹⁵⁹ Sweden discontinued imposing quota restrictions on imports of textile and apparel products in 1991. However, it was not possible to use Swedish import data as a proxy for undistorted world prices because the Swedish Government does not report imports on a customs-value basis. A comparison of Swedish import data with U.S. import data would involve estimating differences in insurance, freight, and other charges as well as adjusting for product differences within each Harmonized Tariff Schedule subheading. There was no reasonable way to adjust for these differences.

¹⁶⁰ U.S. imports reported on the basis of customs value exclude insurance, freight, and other charges.

¹⁶¹ In earlier studies, prices for quotas traded in Taiwan have been available. For example, Hamilton used Hong Kong and Taiwan quota prices to estimate the effects of the MFA on U.S. imports from Hong Kong, Taiwan, and South Korea. Carl B. Hamilton, "Restrictiveness and International Transmission of the 'New' Protectionism," in Robert E. Baldwin, Carl B. Hamilton, and Andre Sapir eds, *Issues in US-EC Trade Relations*, (Chicago: The University of Chicago Press, 1988), 199-224. Kumar and Khanna used quota prices collected through surveys and, to a limited extent, from the Indian Government to estimate ad valorem tariff equivalents faced by Indian exporters. See Kumar and Khanna, in Hamilton (1990), 182-212.

¹⁶² Data on current quota prices are collected by the Hong Kong Trade and Development Council. The quota prices used in this analysis were collected by private brokers and provided to Commission staff by International Business and Economic Research Corporation.

valorem tariff equivalents for the respective quota categories. The available Hong Kong quota prices were limited to apparel products. Based on previous research, it was assumed that the tariff equivalents for textile products amounted to 50 percent of the average tariff equivalent for apparel.¹⁶³ Following this approach, tariff equivalents were estimated for U.S. imports from Hong Kong for each quota category in which the United States imported products in 1991. The import data were then aggregated to the USITC sector level. Total trade-weighted export values for each USITC sector were then calculated under the assumption that the quotas were binding 1) when quota utilization rates reached 80 percent, and 2) when the utilization rates reached 90 percent.¹⁶⁴

Tariff equivalents for U.S. imports from the remaining countries subject to MFA quotas were estimated as follows. For each country, the portion of U.S. imports covered by the bilateral agreement was identified on a quota category basis.¹⁶⁵ The data were then aggregated to the USITC sector level. For each country, the Hong Kong estimated export price for the apparel sector was adjusted to account for differences in wage and productivity rates.¹⁶⁶ Drawing from previous research¹⁶⁷ we assumed that:

$$P_o^e = (W_o/W_{hk})(GO_{hk}/GO_o)p_{hk}^e$$

where P_o^e equals the export price of the other exporter country, W_o equals the labor cost for apparel in the other exporting country, W_{hk} equals the labor cost for apparel production in Hong Kong, GO_o represents the value of gross output per worker for the other exporting country, GO_{hk} represents the value of gross output per worker for Hong Kong, and p_{hk}^e equals the export price for Hong Kong. The resulting value served as a proxy for the foreign country export price.¹⁶⁸ We then calculated an estimated ad valorem tariff equivalent as follows:

$$e = (P_o^{cv}/P_o^e) - 1$$

where e equals the estimated ad valorem tariff equivalent, P_o^{cv} represents the customs value unit price in the exporting country, and P_o^e represents the estimated export price for the exporting country.

The resulting tariff equivalent was then applied to the other USITC sectors (with the tariff equivalent reduced by 50 percent for textile product sectors). This step yielded estimated export values for total imports covered by quota agreements on a USITC sector basis. The export values

¹⁶³ See, for example, Irene Trela and John Whalley, "Global Effects of Developed Country Trade Restrictions on Textiles and Apparel," *The Economic Journal*, vol. 100 (Dec. 1990), 1190-1205.

¹⁶⁴ Bilateral agreements frequently include group limits in addition to restrictions on specific quota categories. Quota categories falling under binding group limits were classified as binding regardless of whether the utilization rates for the particular quota categories were binding. If the utilization rate for a particular quota category exceeded that for the group, it was classified according to the specific limit.

¹⁶⁵ For many countries, the bilateral agreements cover only selected items in a particular quota category. The remaining imports entering under these categories are not subject to the quota levels imposed by the agreement. In addition, CBI countries are afforded special provisions for apparel products made with U.S.-produced fabric. Bilateral agreements with these countries include guaranteed access levels (GALs) for selected products. As a general rule, the GALs are not binding and, therefore, are treated as nonquota trade.

¹⁶⁶ Labor cost data were drawn from data published by the U.S. Department of Labor, Bureau of Labor Statistics, Werner International Management Consultants, "Hourly Labor Costs for the Apparel Industry" for 1991, and UNIDO, *Handbook of Industrial Statistics*, 1992.

¹⁶⁷ See, Hamilton (1988) and Trela and Whalley (1990).

¹⁶⁸ It is important to note that these adjustments may not account for all of the differences between export prices across countries. For example, it is likely that product differentiation resulting from product upgrading may also contribute to intercountry pricing differences. Consequently, to the extent that this is true, the estimated tariffs described below may be somewhat overstated. Other factors, such as differences in capital costs, may also contribute to pricing differences across countries. However, since these industries are relatively labor intensive, the resulting discrepancies are likely to be small.

were then adjusted on the basis of whether or not the quotas covering the respective sectors were binding. As with Hong Kong, total trade-weighted export values for each USITC sector were calculated assuming that the quotas were binding 1) at 80 percent and 2) at 90 percent. For the remaining imports not covered by quotas or covered by quotas that were not binding, the customs value was assumed to be the equivalent of the foreign country export value.

The results of this step (estimated export values by USITC sector for each country) for each scenario were then aggregated and added to customs value data for U.S. imports from countries not covered by bilateral agreements. This step yielded estimated export values for total U.S. imports on an USITC sector basis. The result of this process allowed for the estimation of final ad valorem equivalents for each USITC sector.

Concordance

Table E-1 shows the relationship among the USITC sectors, the BEA input-output categories, and the 4-digit SIC industries for the textile and apparel sectors directly affected by the MFA and for selected upstream and downstream sectors.

Table E-1
Concordance of USITC textile and apparel sectors, BEA input-output categories, and 4-digit SIC industries

USITC Sector	BEA Classification	SIC Classification
Sectors directly affected by MFA quotas:¹		
Broadwoven fabric mills	160100	2211, 2221, 2231, 2261, 2262
Narrow fabric mills	160200	2241
Yarn mills and textile finishing	160300	2269, 2281, 2282
Thread mills	160400	2284
Floor coverings	170100	2273
Felt and textile goods, n.e.c.	170200, 170400, 170500,	
	171002	2299
Lace and knit fabric goods	170300, 180300	2257, 2258
Coated fabrics, not rubberized	170600	2295
Tire cord and fabric	170700	2296
Cordage and twine	170900	2298
Nonwoven fabric	171001	2297
Women's hosiery, except socks	180101	2251
Hosiery n.e.c.	180102	2252
Apparel made from purchased materials	180400	2311, 2321, 2322, 2323, 2325, 2326, 2329, 2331, 2335, 2337, 2339, 2341, 2342, 2353, 2361, 2369, 2371, 2381, 2384, 2385, 2386, 2387, 2389
Curtains and draperies	190100	2391
House furnishings, n.e.c.	190200	2392
Textile bags	190301	2393
Canvas and related products	190302	2394
Pleating, stitching, trimmings, and Schiffl embroidery	190303, 190304, 190305	2395, 2396, 2397
Fabricated textile products, n.e.c.	190306	2399
Luggage	340302	3161
Women's handbags and purses	340303	3171
Upstream and downstream sectors:		
Cotton	020100	0131
Cellulosic man-made fibers	280300	2823
Noncellulosic organic fibers	280400	2824
Nonmetal furniture	220101, 220102, 220200,	2511, 2519, 2512, 2515, 2521
	220400, 230100, 230300	2531

¹ Production, employment, trade, labor, and capital stocks associated with knit outerwear and underwear mills and knitting mills n.e.c. (BEA numbers 180201, 180202, and 180203, respectively) were allocated to selected sectors listed above in accordance with the 1987 BLS make matrix.

Source: U.S. Department of Commerce, Bureau of Economic Analysis.

**APPENDIX F
PARTIAL EQUILIBRIUM
METHODOLOGY USED IN THE
ANALYSIS OF THE U.S. PEANUT
IMPORT QUOTA**

PARTIAL EQUILIBRIUM METHODOLOGY USED IN THE ANALYSIS OF THE U.S. PEANUT IMPORT QUOTA

A partial equilibrium model of the economic effects of the peanut import quota is used because peanuts do not constitute a sector in the social accounting matrix of the USITC's computable general equilibrium model.

Prices

The world price used in estimating the economic effects of the peanut import quota is the simple average of monthly prices for U.S. shelled medium runner peanuts quoted c.i.f. Rotterdam, over the August through July crop year, adjusted for transportation costs from the United States to Europe. The U.S. price used is the U.S. support price for edible peanuts. The former price is on a shelled basis while the latter is on a farmers' stock basis, so comparison can be made only after they are put on the same basis. For example, to construct the support price on a shelled basis, the formula in table F-1 is used.

To construct the "world" in-shell price in the United States, first, an estimate of shipping costs from the U.S. to Europe of 6.4 cents per kilogram was subtracted from the simple average c.i.f. Rotterdam price for U.S. medium shelled runners of \$845.90 per metric ton.¹⁶⁹ Then the formula in table F-1 was reversed to construct an in-shell price of 16.86 cents per lb. from a shelled price.

Table F-1
Shelled U.S. peanuts: Constructed U.S. domestic market price, crop year 1991/92

U.S In-shell support price ¹		Less volume loss from shelling ²		Less volume loss from culling ³		Plus costs of shelling, culling, etc. ⁴		Equals constructed U.S. market price of shelled peanuts
(cents/lb)								(cents/lb)
32.14	x	1.333	x	1.136	+	10.0	=	58.70

¹ Farmers' stock basis.

² Shelling loss estimated to be 25 percent (multiply by 1.333).

³ Culling loss estimated to be 12 percent (multiply by 1.136).

⁴ Costs are estimated as 10 cents per lb. (add 10 cents per lb.).

Source: Support price from USDA, Agricultural Stabilization and Conservation Service. Formula from USITC, *Estimated Equivalents of U.S. Quotas on Agricultural Imports and Analysis of Competitive Conditions in U.S. Foreign Markets for Sugar, Meat, Peanuts, Cotton, and Dairy Products*, publication 2276, Feb. 1990.

¹⁶⁹ The simple average of monthly prices in Rotterdam was computed from a monthly series supplied by Stanley Fletcher of the University of Georgia, Georgia Experiment Station, Griffin, GA, that was derived from the *Public Ledger*, London, UK. This monthly series differs slightly from the series published by USDA.

Partial Equilibrium Model

A simplified model of the U.S. edible peanut market is illustrated in figure F-1. Area A illustrates the transfer from producers to consumers if edible peanuts are sold in the United States at the world price. Area A is the difference between the U.S. support price, P_S (32.14 cents per pound), and the world price, P_W (16.86 cents per pound), multiplied by the quantity of peanuts sold for food use in the U.S. market, Q_1 (2,207 million pounds, farmers' stock basis).

Area B illustrates the value in excess of the world price of the additional peanuts that would be consumed at the world price compared to what would be consumed at the support price. When the import quota and support price are in force, this area represents what economists call a "deadweight" cost or social welfare loss, in that it represents a loss to consumers not matched by a gain to producers. To calculate the area of this "welfare triangle," an estimate of U.S. peanut consumption at the world price was made using a price elasticity of demand of -0.14.¹⁷⁰ This estimate of 209 million pounds higher than actual consumption in crop year 1991/92 was multiplied by the difference between the support and world prices, $P_S - P_W$, (15.28 cents/lb.), and divided by 2, to yield an approximation of the social welfare loss of \$16 million.

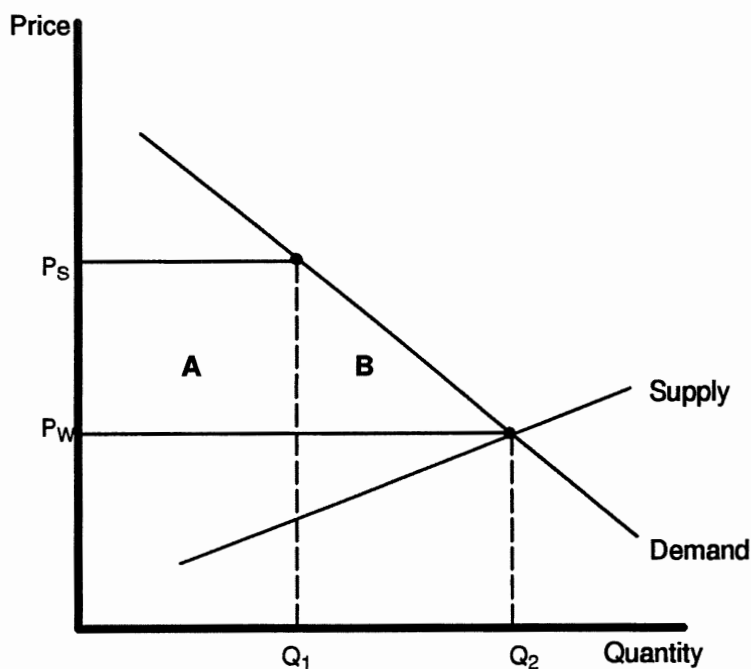
¹⁷⁰ The elasticity estimate of -0.14 is from Rucker and Thurman (1990). James Schaub has used an estimate of -0.20 in "Peanut Demand Estimates and Consumers' Cost of the Peanut Program," paper presented at the annual meeting of the American Peanut Research and Education Society, Orlando, FL, (July 1987). If the latter is used, additional consumption would be 304 million pounds and the deadweight loss recovered would be \$23.2 million. The choice of demand elasticity does not affect the estimate of the transfer from producers to consumers.

The following formula is used in computing the estimate of U.S. consumption at P_w (Q^2):

$$\ln \frac{Q_2}{Q_1} = \ln \frac{P_w}{P_s} = \epsilon,$$

where "ln" indicates the natural logarithm, ϵ is the price elasticity of demand in the United States, and the P_s and Q_s are as defined in figure F-1. This equation is solved for Q^2 with $Q^1 = 2,207$, $P^W = 16.86$, $P^S = 32.14$, and $\epsilon = -0.14$. The logarithm of a ratio of quantities or prices is equivalent to the percentage change in quantity or price.

Figure F-1
U.S. domestic peanut market: Effects of the U.S. peanut program on the market; and economic welfare effects of the program¹



- P_s = Support price for edible peanuts
- P_w = World price of U.S. peanuts
- Q_2 = Quantity of peanuts that would be consumed domestically at the world price P_w
- Q_1 = Quantity of peanuts demanded at the edible support price P_s
- $Q_2 - Q_1$ = Quantity of peanuts exported at the world price
- A = Income transfer from consumers to producers
- B = Deadweight social welfare loss

¹ The quota on imports of peanuts allows the peanut program to operate without large costs to the U.S. Treasury. Its function is as much to exclude the reentry of exported U.S. peanuts as it is to exclude imports. Imports are limited to about .05 percent of U.S. production, a quantity that is effectively zero for analytical purposes.



