The Economic Effects Of Significant U.S. Import Restraints

Third Update 2002

Investigation No. 332-325

June 2002

Publication 3519

United States International Trade Commission

U.S. International Trade Commission

COMMISSIONERS

Stephen Koplan, Chairman
Deanna Tanner Okun, Vice Chairman
Lynn M. Bragg
Marcia E. Miller
Jennifer A. Hillman

Robert A. Rogowsky
Director of Operations

Robert B. Koopman
Director, Office of Economics

Address all communications to
Secretary to the Commission
United States International Trade Commission
Washington, DC 20436
www.usitc.gov

This report was prepared by the

Office of Economics
under the direction of

Hugh M. Arce
Chief, Research Division

Project Team

Sandra A. Rivera, *Project Leader*
Kyle Johnson, *Deputy Project Leader*
Alan K. Fox, *Deputy Project Leader*

Edward J. Balistreri, Judith M. Dean,
Michael J. Ferrantino, and Marinos E. Tsigas

Office of Industries
Dennis R. Luther, *ID Coordinator*

Joanna L. Bonarriva, Laura S. Bloodgood,
Devry S. Boughner, Jonathan R. Coleman, Roger L. Corey,
John T. Fry, Jackie W. Jones, Timothy P. McCarty,
Warren S. Payne, Tracy Quilter, Karl Rich, George S. Serletis,
Rose M. Steller, Karen L. Taylor, and Joann Tortorice

Office of the General Counsel
William W. Gearhart

Reviewers
Richard Brown, Joanne Guth, and Edward C. Wilson

Interns
John B. Mullen and Kelley M. Page

Administrative Support
Cecelia N. Allen

List of Frequently Used Abbreviations and Acronyms

AMTA	Agricultural Market Transition Act
ATC	Uruguay Round Agreement on Textiles and Clothing
ATPA	Andean Trade Preference Act
BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
c.i.f.	Cost, insurance, and freight
CBERA	Caribbean Basin Economic Recovery Act
CBTPA	United States-Caribbean Basin Trade Partnership Act
CCC	Commodity Credit Corporation
CGE	Computable general equilibrium
Commission	U.S. International Trade Commission
COMPAS	Commercial Policy Analysis System
ERS	Economic Research Service
ETE	Export tax equivalent
EU	European Union
FAIR	Federal Agriculture Improvement and Reform
FAS	Foreign Agricultural Service
FMD	Foot-and-Mouth and Rinderpest diseases
f.o.b	Free-on-board
FTE	Full-time equivalent
GAO	U.S. General Accounting Office
GATS	General Agreement on Trade in Services
GATT	General Agreement on Tariffs and Trade
GSP	Generalized System of Preferences
H-O	Heckscher-Ohlin
HTS	Harmonized Tariff System of the United States
IMO	International Maritime Organization
IR	Import restraint
Jones Act	Merchant Marine Act of 1920
MARAD	The Maritime Administration
MFA	Multifiber Arrangement
MOU	Memorandum of Understanding
MPC	Milk protein concentrates
MT	Metric tons
MY	Marketing year
NAFTA	North American Free Trade Agreement
NTM	Nontariff measures
NTR	Normal Trade Relations
OPA-90	Oil Pollution Act of 1990
QRs	Quantitative restrictions
QY	Quota year
SCPs	Sugar and sugar-containing products

SEC	Securities and Exchange Commission
SIC	Standard Industrial Classification
SITC	Standard Industrial Trade Classification
SMEs	Square meter equivalents
SSA	Sub-Saharan Africa
SSGs	Special safeguards
TAA	Trade Adjustment Assistance
TCAA	Transatlantic Common Aviation Area
TEUs	Twenty-foot equivalent units
TMB	Textile Monitoring Body
TPLs	Tariff preference levels
TRQs	Trade-rate quotas
URA	Uruguay Round Agreement
URAA	Uruguay Round Agreement on Agriculture
U.S.C.	United States Code
USDA	U.S. Department of Agriculture
USDOC	U.S. Department of Commerce
USDOL	U.S. Department of Labor
USDOT	U.S. Department of Transportation
USITC	U.S. International Trade Commission
USTR	United States Trade Representative
VERs	Voluntary export restraints
WTO	World Trade Organization

CONTENTS

	Page
List of Frequently Used Abbreviations and Acronyms	i
Executive Summary	xv
Chapter 1. Introduction	1
Scope of the study	1
Approach of the study	3
USITC CGE model	5
Basic structure	5
Data	6
Organization of the report	6
Chapter 2. Simultaneous Changes In All Significant U.S. Import Restraints	9
Identification of significant import restraints	10
Economywide effects of removing U.S. import restraints	13
Sectoral effects of removing all significant U.S. import restraints	15
Focus sectors	18
Rest of the U.S. economy	19
Chapter 3. Textiles and Apparel	21
Market access provisions	22
Tariff treatment	22
Agreement on textiles and clothing	23
NAFTA	26
Trade and development act of 2000	27
Results of previous work	27
Restrictiveness of import restraints	30
Methodology	32
Model specification	37

CONTENTS—*Continued*

Page

Chapter 3. Textiles and Apparel—*Continued*
Effects of liberalization 38
Case 1: Removal of textile and apparel quotas 39
Case 2: Removal of textile and apparel tariffs and quotas 42

Chapter 4. Agriculture 45
Tariff-rate quotas 45
Model specification 47
Modeling food and agricultural border measures . . . 48
Dairy products 50
Nature of trade barriers 52
Restrictiveness of trade barriers 55
Previous work 57
The effects of liberalization 58
Sugar and sugar containing products 62
Nature of trade barriers 63
U.S. domestic sugar policy 65
U.S. trade policy for sugar 65
NAFTA TRQs 65
URAA TRQs 66
Restrictiveness of trade barriers 67
Previous work 68
The effects of liberalization 71
Peanuts 75
Nature of trade barriers 76
Restrictiveness of trade barriers 77
Previous work 79
The effects of liberalization 79
Cotton 79
Nature of trade barriers 81
Restrictiveness of trade barriers 82
Previous work 83
The effects of liberalization 83
Tobacco and tobacco products 85

CONTENTS—*Continued*

Page

Chapter 4. Agriculture—*Continued*

Nature of trade barriers 88
Restrictiveness of trade barriers 90
Previous work 91
The effects of liberalization 91
Ethyl alcohol 93
Nature of trade barriers 94
U.S. domestic ethanol policy 95
U.S. trade ethanol policy 95
Tariffs 95
Tariff-rate quota 96
Additional excise tax on imports 96
Restrictiveness of trade barriers 97
The effects of liberalization 97
Canned tuna 98
Nature of trade barriers 98
Restrictiveness of trade barriers 99
The effects of liberalization 99
Beef 100
Nature of trade barriers 101
Restrictiveness of trade barriers 103
Previous work 104
The effects of liberalization 104
Olives 104
Nature of trade barriers 105
Restrictiveness of trade barriers 106
The effects of liberalization 106
Section 201 border measures 107
Wheat gluten 107
Nature of trade barriers 107
Restrictiveness of trade barriers 108
The effects of liberalization 110

CONTENTS—*Continued*

Page

Chapter 4. Agriculture—*Continued*

Lamb meat 110
Nature of trade barriers 111
Restrictiveness of trade barriers 113
The effects of liberalization 113

Chapter 5. Services 115
Introduction 115
Maritime transport 115
Current operation of the Jones Act and other U.S. cabotage laws 116
Characteristics of the Jones Act fleet 118
Compliance with U.S. liability and other laws and regulations 119
Cost differentials: U.S. coastwise vs. foreign trade 121
Previous work 122
Model specification 122
Complete liberalization 125
Partial liberalization scenarios 127
Truck transport 129
NAFTA developments 131
Equipment 132
Regulatory harmonization 133
U.S. inspection capabilities 133
Efficiency implications 135
Air transport 136
Bilateral agreements 137
U.S. domestic regulations 138
Restrictions on ancillary domestic markets 139
Recent developments in international air transport services 140
Financial services 141

CONTENTS—*Continued*

Page

Chapter 6. Significant Tariff Restraints 145
Introduction 145
Economic effects of removing significant tariff restraints . . 147
Anticipated effects of liberalization 148
Frozen fruits, fruit juices and vegetables 149
Economic effects of tariff removal 149
Footwear 151
Economic effects of tariff removal 151
Ceramic wall and floor tile 153
Economic effects of tariff removal 153
Table and kitchenware 155
Economic effects of tariff removal 155
Ball and roller bearings 157
Economic effects of tariff removal 157
Watches, clocks, watchcases, and parts 159
Economic effects of tariff removal 159
Costume jewelry 161
Economic effects of tariff removal 161
Simultaneous removal of all significant tariffs 163

Chapter 7. Special Focus on Labor Transitions 167
Summary of findings 167
Introduction 168
Review of literature 169
Trade theory and wages 170
Determinants of the skilled labor premium 172
Evidence on the transition experiences of displaced workers 175
Estimated effects of simultaneous liberalization of import restraints on displaced workers 178
Estimated geographic distribution of IR displaced workers 179
Estimated post-displacement experiences of IR displaced workers 181

CONTENTS—*Continued*

Page

Chapter 7. Special Focus on Labor Transitions—*Continued*

Estimated demographic and job-related characteristics of IR displaced workers 189
Other possible consequences of potential worker displacement due to trade liberalization 191
Aggregate unemployment 191
Regional employment effects 193
Comparing transitions in the model and survey data 194

Appendices

A. Request letter A-1
B. *Federal Register* notice and list of hearing participants B-1
C. Textile and apparel-related legislation C-1
D. USITC models D-1
E. Measures of nontariff barriers E-1
F. Statistical procedures for transition effects analysis F-1
G. Mapping between BEA classifications and USITC model sectors G-1

Tables

ES-1. Economic welfare changes from liberalization of all significant import restraints, by sector, 1999 xviii
2-1. Significant U.S. import restraints, by sectors, 1999 11
2-2. Aggregate economic effects of simultaneous liberalization of all import restraints, and significant import restraints, 1999 14
2-3. Economic effects of simultaneous liberalization of all significant import restraints, changes in FTE, output, trade, and prices, 1999 16
3-1. Textiles and apparel: Summary data, 1999 22
3-2. Trading partners with which the United States had textile and apparel quotas in 1999, and U.S. imports of textiles and apparel from these partners in 1999 . . 25

CONTENTS—*Continued*

Page

Tables—*Continued*

3-3. Import-weighted average tariffs, estimated ad valorem export tax equivalents and quota rents for textiles and apparel by sectors, 1999 35
3-4. Restrictions on apparel imports, 1999 38
3-5. Case 1: Sector-specific economic effects of textile and apparel quota elimination, changes in FTEs, value and percent, 1999 40
3-6. Case 2: Sector-specific economic effects of textile and apparel quota and tariff elimination, changes in FTEs, value and percent, 1999 43
4-1. Diary: Summary data, 1997-99 51
4-2. Dairy products: Tariff-rate quota percentage fill rates, 1997-99 55
4-3. Dairy: Selected economic effects of TRQ removal, 1999 59
4-4. Sugar: Summary data, 1997-99 64
4-5. Sugar: Selected economic effects of TRQ removal, 1999 72
4-6. Peanuts (farmers' stock basis): Summary data, 1997-99 76
4-7. WTO and NAFTA tariff-rate quota quantities for peanuts, except peanut butter and peanut paste, 1997-2000 78
4-8. U.S. import tariff rates for peanuts, except peanut butter and peanut paste, 1997-2000 78
4-9. Peanuts: Selected economic effects of TRQ removal, 1999 79
4-10. Cotton: Summary data, marketing years 1997-99 80
4-11. Cotton: Selected economic effects of TRQ removal, 1999 84
4-12. Tobacco: Summary data, 1997-99 86
4-13. Tobacco: TRQ in-quota quantities allocated and imports, metric tons, 1999 89

CONTENTS—*Continued*

Page

Tables—*Continued*

4-14. Tobacco: TRQ percentage fill rates, quota years, 1998-2000 90
4-15. Tobacco: Selected economic effects of TRQ removal, 1999 92
4-16. Ethyl alcohol for fuel use: Summary data, 1997-99 94
4-17. Canned tuna: Summary data, 1997-99 98
4-18. Canned tuna: Selected economic effects of TRQ removal, 1999 100
4-19. Beef: Summary data, 1997-99 100
4-20. Beef: In-quota allocated by countries and percentage fill rates, 1997-99 102
4-21. Olives: Summary data, 1997-99 105
4-22. Wheat gluten: Summary data, marketing years 1997-99 107
4-23. Wheat gluten: Quota allocation and fill rate, quarter year 1998 and 1999 109
4-24. Lamb meat: Summary data, 1997-99 110
4-25. Lamb meat: TRQ in-quota quantities, and TRQ percentage fill rate, 1999-2000 112
4-26. Lamb meat: Estimates of selected economic effects of TRQ removal, 1999 113
5-1. U.S. domestic cargo sector for vessels 1,000 gross tons and larger: Total revenues and employment, by types, 1995-99 118
5-2. Comparison of daily operating expenses for U.S.-flag vs. foreign-flag vessels, 1999 121
5-3. Economywide results of liberalizing the coastwise Jones Act fleet, 1999 124
5-4. Economic effects of complete liberalization of domestic coastwise water transportation, change from benchmark, 1999 126

CONTENTS—*Continued*

Page

Tables—*Continued*

5-5. Economic effects of removing the domestic-build requirement on domestic coastwise water transportation, change from benchmark, 1999 128
5-6. Truck transport: U.S. industry summary data, 1997-99 130
5-7. Original NAFTA timetable for U.S.-Mexico truck transport services 131
5-8. Status of safety standards harmonization 134
5-9. Air transport: U.S. industry summary data, 1997-99 137
5-10. Import restraints in the U.S. insurance sector (life and non-life) 142
5-11. Import restraints in the U.S. banking and securities sectors 143
5-12. Banking, insurance, and other financial services: Summary data, 1997-99 144
6-1. Effective U.S. tariff rates by 1-digit standard industrial trade classification sectors, 1992-2000 146
6-2. Model sectors with the highest effective tariff rates not discussed elsewhere in study 147
6-3. Frozen fruits, fruit juices and vegetables: Summary data, 1997-99 149
6-4. Frozen fruits, fruit juices and vegetables: Economic effects of tariff removal, change from benchmark 1999 150
6-5. Footwear: Summary data, 1997-99 151
6-6. Footwear: Economic effects of tariff removal, change from benchmark, 1999 152
6-7. Ceramic wall and floor tile: Summary data, 1997-99 . . 153
6-8. Ceramic wall and floor tile: Economic effects of tariff removal, change from benchmark, 1999 154
6-9. Table and kitchenware: Summary data, 1997-99 155
6-10. Table and kitchenware: Economic effects of tariff removal, change from benchmark, 1999 156

CONTENTS—*Continued*

Page

Tables—*Continued*

6-11. Ball and roller bearings: Summary data, 1997-99 157
6-12. Ball and roller bearings: Economic effects of tariff removal, change from benchmark, 1999 158
6-13. Watches, clocks, watchcases, and parts: Summary data, 1997-99 159
6-14. Watches, clocks, watchcases, and parts: Economic effects of tariff removal, change from benchmark, 1999 160
6-15. Costume jewelry: Summary data, 1997-99 161
6-16. Costume jewelry: Economic effects of tariff removal, change from benchmark 1999 162
6-17. All significant tariffs: Economic effects of tariff removal, change from benchmark, 1999 164
7-1. Estimated IR displaced workers by state 182
7-2. Difference between post-displacement experiences of IR workers and all workers, 1995-99 186
7-3. Labor force status of IR displaced workers and all displaced workers, 1995-99 188
7-4. Difference between personal and job characteristics of IR displaced workers and all displaced workers, 1995-99 191
7-5. Aggregate change in employment between 1997 and 2001, selected states 193
7-6. Sectors absorbing workers displaced from IR sectors, percent 195
D-1. Sectoral specification for CGE simulations D-6
D-2. Derivation of U.S.-world price wedges for food and agriculture in CGE model D-17
D-3. Elasticities values used in partial equilibrium analysis D-24

CONTENTS—*Continued*

Page

Figures—*Continued*

7-1. Estimated distribution of IR displaced workers 184
7-2. Cumulative weeks of unemployment 187
D-1. Specification of Armington elasticities in USITC CGE model D-9
D-2. Product and commodity structure D-11
D-3. Effect of eliminating a tariff for GSP beneficiary imports: U.S. markets for GSP beneficiary imports (panel a), domestic production (panel b), and nonbeneficiary imports (panel C) D-19

EXECUTIVE SUMMARY

Introduction

This update of previous U.S. International Trade Commission (USITC) import restraint reports, conducted at the request of the United States Trade Representative, analyzes the economic effects of removing significant U.S. import restraints on the domestic economy. The analysis reports the expected effects of liberalizing restraints on U.S. manufacturing, agriculture, and services. This update examines the 1999 economy and the trade barriers that existed during that year.[1]

Analytical Scope and Approach

Import restraints examined for 1999 include tariffs, tariff-rate quotas (TRQs), actions under section 201 of the Trade Act of 1974, nontariff measures such as quotas, cabotage[2] restrictions in transportation services, and international agreements. The barriers in place during 1999 that were examined include:

- quantitative restrictions on textiles and apparel specific to the World Trade Organization (WTO) Agreement on Textiles and Clothing and bilateral agreements with non-WTO member countries;
- TRQs on dairy products, sugar and sugar-containing products, peanuts, cotton, tobacco and tobacco products, canned tuna, ethyl alcohol, beef, and olives;
- section 201 import relief (safeguard) actions on wheat gluten and lamb;
- an import ban on maritime cabotage services; and
- certain peak tariffs.

[1] Because large economies rarely experience significant structural shifts from one year to the next, the 1999 base-year results can give policymakers an estimate of the implications of removing significant U.S. barriers for the current economy. The base year is a snapshot from which policymakers can make inferences to the current year. The year 1999 was chosen for the base year since it reflects the most recent data consistently available.

[2] Cabotage is the transport of products or people between two points within a country.

Peak tariff sectors are defined as those with trade-weighted average ad valorem tariffs greater than 5.05 percent.[3] After the peak tariff sector list was identified, other sectors under examination separately in the current report were eliminated.[4] The remaining seven peak tariff sectors selected for analysis were: frozen fruits, fruit juices, and vegetables; footwear; ceramic wall and floor tile; table and kitchenware; ball and roller bearings; watches, clocks, watchcases, and parts; and costume jewelry.

An important innovation this year is the inclusion of a special focus chapter on the transition experience of workers in sectors affected by trade policy changes. The last chapter identifies the likely characteristics of those workers most affected by the liberalization analyzed here, and their post-liberalization adjustment experiences.

Models Used

The primary tool used to analyze the impact of these barriers is the USITC computable general equilibrium (CGE) model of the U.S. economy. The model is based on a system of equations that are consistent with the U.S. Department of Commerce's (USDOC) Bureau of Economic Analysis (BEA) input-output table for the U.S. economy. In addition to specifying changes in each sector analyzed, the model estimates economywide changes–such as economic welfare–that occur from liberalization.

Two types of CGE analysis are implemented in the study. The first type of analysis (reported in chapter 2) estimates the economywide effects of removing all significant import restraints at once for sectors covered in this report. Second, the effects of eliminating barriers on individual sectors are examined, including relevant upstream and downstream sectors, in chapters 3 through 6. For each simulation, the Commission reports estimated effects on

---

[3] To identify the relevant sectors, the Commission calculated the trade-weighted average tariff by Bureau of Economic Analysis sector. The average tariff is constructed by dividing the calculated duties for the model sector by the c.i.f. value of imports for consumption. The peak tariffs are identified as those sectors with a tariff of more than one standard deviation (3.34 percent) above the U.S. simple average of the trade-weighted aggregate tariff of 1.71 percent, i.e., above 5.05 percent. This average includes sectors that have a free rate of duty.

[4] Sectors that qualify as peak tariff sectors that are analyzed elsewhere in the current report include: textiles and apparel (luggage, woman's handbags and purses; leather gloves and mittens); apparel made from purchased materials; personal leather goods not elsewhere classified; curtains and draperies; broadwoven fabric mills and fabric finishing plants; knit fabric mills; pleating and stitching; women's hosiery except socks; thread mills; house furnishings, not elsewhere classified; canvas and related products; and cellulosic (manmade fibers) and agriculture (butter; cheese; ice cream; fluid milk; frozen desserts; cigarettes; and tobacco stemming and redrying).

economywide welfare changes, trade, employment, and output for the liberalized sector (or sectors) and the overall economy.

For a few agricultural sectors and one manufacturing sector, CGE model analysis was not feasible because the relevant sectors were not separately identified in the model's database. Therefore, a partial equilibrium model is instead used to assess the welfare implications of U.S. import restraint removal. There are no employment effects estimated with the partial equilibrium model. Sectors where the partial equilibrium model is employed include: tobacco and tobacco products, peanuts, canned tuna, and lamb.

Results

In this study, economic welfare is a measure of economywide well-being that is consistent with economic theory. The experiments measure all the changes in welfare resulting from the removal of significant import restraints, including the benefits of less expensive imports. Lower real import prices reduce production costs through cheaper intermediate inputs and reduce consumption costs. Welfare also encompasses the costs of increased import competition in industries that contract as a result of liberalization. Additionally, changes in welfare account for lost tariff revenue. Last, welfare includes changes in the U.S. position in the world economy through changes in the terms of trade. The reported changes in welfare should be interpreted as comprehensive within the limits of the model framework.

If all of the trade barriers considered in this report had been simultaneously eliminated during the base year of 1999, the result would have been equivalent to an approximate welfare gain of $14.35 billion to the U.S. economy (see table ES-1). During 1999, U.S. gross domestic product (GDP) was slightly less than $9.3 trillion.[5] The welfare gain represents less than one-tenth of 1 percent of GDP. This small percentage is in line with what previous authors using static CGE models have predicted would be the expected effect on the United States from removing all tariffs and nontariff measures (NTMs).[6]

Consistent with previous reports, the largest effect is in the individual liberalization of textiles and apparel, which is expected to cause an estimated economywide welfare gain of about $13.0 billion, assuming that both peak

[5] White House, Table B-1, *Economic Report of the President* (Washington DC: U.S. Government Printing Office, February 2002), p. 320.

[6] Drusilla K. Brown "Properties of CGE Trade Modules with Monopolistic Competition and Foreign Direct Investment," presented at the USITC NAFTA symposium on Feb. 24, 1992. For a summary, see USITC *Economy-Wide Modeling of the Economic Implications of an FTA with Mexico and a NAFTA with Canada and Mexico,* publication 2516, May 1992. Other CGE models have predicted larger effects. From the same study, see David Roland-Holst et al. "North American Trade Liberalization and the Role of Nontariff Barriers (NTBs)," who report gains up to about 2.5 percent with a dynamic model, contestable markets, and all tariffs and NTBs removed.

Table ES-1
Economic welfare changes from liberalization of all significant import restraints, by sector, 1999

Sector	Change in economic welfare
	Million dollars
CGE Estimates:	
Simultaneous sector liberalization of all significant restraints	14,350
Individual Liberalization:	
Textiles and Apparel	13,040
Maritime transport (Jones Act)	656
U.S. build liberalization (capital only)	*261*
Sugar	420
Dairy	109
Footwear	109
Frozen fruits, fruit juices and vegetables	11
Ball and roller bearings	10
Watches, clocks, watch cases and parts	10
Table and kitchenware	5
Costume jewelry	3
Ceramic wall and floor tile	3
Partial Equilibrium Estimates:	
Peanuts	2.2
Canned tuna	1.6
Lamb meat	0.5-1.4

Source: USITC estimates.

tariffs and quotas are removed simultaneously.[7] The second largest expected liberalization effect is with the complete liberalization of maritime cabotage services under the Jones Act, where the estimated gain would be slightly more than $656 million. If the liberalization in maritime services were limited to eliminating the U.S. shipbuilding requirement, gains would be slightly less than $261 million.

Liberalization of two high-profile agricultural sectors–sugar and dairy–once again show the largest sector-specific benefits. When liberalization on sugar and dairy are conducted individually, the sugar sector is expected to experience an economywide welfare gain of about $420 million while dairy is expected to experience a $109 million economywide gain.

For the peak tariff sector analysis, individual simulations showed the footwear sector had the highest gain from liberalization–by nearly

[7] Note that results from an experiment in which restraints for many sectors are removed are *not* equivalent to adding up the results from experiments eliminating the restraints individually.

10 times–and is expected to experience an increase in welfare by about $109 million. Smaller welfare gains are expected in frozen fruits, fruit juices, and vegetables (about $11 million); ball and roller bearings (about $10 million); and watches, clocks, watch cases, and parts (about $10 million).

Employment, Output, and Trade Effects

Both sector-specific and economywide analyses were conducted for each industry or sector identified as having a significant import restraint (chapters 3 to 6). In general, if these sectors are liberalized, imports are expected to increase significantly and exports may decline somewhat in sectors subject to the removal of import restraints. The removal of significant import restraints generally results in a fall in U.S. employment and output in the liberalized sectors. However, these employment and output declines are expected to be offset by increases in employment and output throughout the rest of the economy.

Commission estimates indicate that the elimination of significant import barriers would result in the net addition of nearly 17,400 full-time equivalent (FTE)[8] workers into the labor force, or about one-one hundredth of 1 percent of the 1999 national labor force (in FTE workers) of 122.1 million.[9] By contrast, in a typical week during 1999, between 300,000 and 400,000 U.S. workers applied for unemployment compensation.

Textiles and Apparel

Textiles and apparel quantitative restrictions regulated by the ATC and other bilateral agreements are the most extensive NTMs within the manufacturing sector. More than 50 percent of U.S. apparel imports face binding, quantitative restrictions that result in an average price increase of more than 20 percent. In addition, the average ad valorem tariff on all U.S. apparel imports is 11.7 percent. The combined effect of both barriers is an average price increase of 34.4 percent.

Because tariff and quantitative restrictions are so high in this sector, the removal of both restrictions on U.S. textile and apparel imports is estimated to raise U.S. net welfare by about $13 billion annually. The largest gains from

[8] According to USDOC, BEA, full-time equivalent employees are defined as "the number of employees on full-time schedules plus the number of employees on part-time schedules converted to a full-time basis." Thus, FTE employees can include both full-time and part-time workers as well as an adjustment for overtime worked. See the National Income and Product Accounts, Table 6.5C found at Internet address *http://www.bea.gov/bea/dn/nipaweb*, retrieved on Apr. 8, 2002. Throughout this report, FTE employees is used interchangably with FTE workers and FTE jobs.

[9] Total FTE labor force data from the USDOC, BEA, National Income and Product Accounts Table 6.5C found at Internet address *http://www.bea.gov/bea/dn/nipaweb,* retrieved on Apr. 26, 2002.

removal of both tariff and quantitative restrictions on U.S. textile and apparel imports would be in: apparel (average real prices would fall by about 17 percent); luggage and handbags (real prices decrease by 13 percent); and home furnishings (real prices decrease by 4 percent). The sectors with the largest contractions from removal of both tariff and quantitative restrictions on U.S. textile and apparel imports include knit fabric mills, apparel, and luggage and handbags. Output and employment would decline by about 30 percent in the manufacture of luggage and handbags, 26 percent in knit fabric mills, and 17 percent in the apparel sector.

Agriculture

General equilibrium analysis of U.S. TRQs on dairy, sugar, tobacco, and cotton suggests that trade liberalization likely would affect the U.S. economy in several ways. First, the U.S. market would face lower real prices. For the base case, real sugar prices would be 6.2 percent lower; real butter prices would be 1.6 percent lower; and real cheese prices, and tobacco prices would be about 1 percent lower. Second, U.S. imports likely would increase. For example, if barriers are removed, sugar imports are expected to increase by about 108 percent; butter imports are estimated to increase by about 54 percent; ice cream imports are expected to increase by about 30 percent; and cheese imports are expected to increase by about 22 percent. The analysis suggests that the removal of the sugar TRQs would enable other sectors to absorb about 3,020 FTE jobs from sugar crops, sugar manufacturing, and other sugar containing products. The TRQ removal from dairy would enable other sectors to absorb about 590 FTE jobs from that sector.[10]

The removal of these four TRQs would lead to a larger labor force. The expected combined impact of removing the four agriculture TRQs is that about 870 new FTE jobs are estimated to become available to U.S. labor force participants. Finally, removal of the four TRQs would be expected to increase U.S. economic welfare by about $537 million, with most of the gains due to removal of the sugar and dairy TRQs.

Partial equilibrium analysis of the U.S. TRQs on peanuts, canned tuna, and lamb meat suggests that trade liberalization of these sectors would have more modest impacts. Lower-priced imports are expected to enter the U.S. market; for example, imports of peanuts are estimated to increase by about 36 percent, canned tuna imports are expected to increase by about 10 percent, and imports of lamb meat are expected to increase by about 10 percent to 17 percent. In addition, the U.S. market likely would experience lower real prices. Specifically, real peanuts prices would be expected to be about 4.4 percent lower; real canned tuna prices about 3.6 percent lower; and real lamb meat prices about 2.8 to 4.5 percent lower.

[10] The impacts of liberalization in dairy, sugar, cotton, and tobacco are quite sensitive to the specification of key model parameters. The relevant sections in chapter 4 discuss the sensitivity of results.

Finally, removal of these three TRQs could increase economic welfare in the United States in the range of $4.3 million to $5.2 million. The expected welfare gain economywide from removal of the TRQ on peanuts is about $2.2 million while the expected welfare gain from removal of the TRQ on canned tuna is $1.6 million. The expected welfare gain from removing the lamb meat TRQ is between $0.5 million and $1.4 million.[11]

Maritime Services

The only significant measurable U.S. import restraint on services is in the transportation sector. Complete liberalization of oceanborne domestic water transport results in a $656 million net welfare gain, which is smaller than the gain predicted in the previous report. The oceanborne fleet covered by the Jones Act has contracted more than 40 percent during the past decade. Most of the reduction occurred after 1996, the base year of the last report.[12] As a result, employment losses in the transportation sector from liberalization would affect about 7,700 maritime FTE workers and about 3,100 FTE workers in the shipbuilding sector.

More conservative estimates of foreign-cost advantages under free-trade conditions change the model results, showing significantly less import penetration in the U.S. market and smaller welfare gains. Relaxing the domestic construction requirement alone is estimated to generate $261 million in net welfare gains, but could result in a loss of about 4,000 domestic shipbuilding FTE jobs. These changes are the result of falling capital costs.

Peak Tariff Sectors

If all tariffs from the seven peak tariff sectors were simultaneously removed, results suggest that net welfare likely would increase by about $152 million. Job displacement throughout the economy likely would be about 6,450 FTE positions, while an additional 9,450 FTE workers are estimated to be drawn into the workforce. With liberalization, real prices of the composite goods likely would decline by 1.1 percent to 7.4 percent. Removal of individual significant tariff restraints likely would lead to improvement in net welfare in each of the seven product categories. However, the expected increase varies substantially from category to category.

[11] Although the import restraints on lamb meat were in place until Nov. 15, 2001, the simulation analysis examines the lifting of these restraints in 1999, the base year of the study. See Proclamation 7502 of Nov. 14, 2001, 66 Federal Register 57837 for more detail.

[12] In 1989, the fleet shipped $3.05 billion in goods. The number fell to $2.57 billion in 1996 and dropped to $1.83 billion in 1999, the current report's base year.

The largest net welfare gain, around $109 million, likely would result from liberalization of the footwear sector. This gain represents about 72 percent of the net benefit across all seven groupings. The estimated 1,510 FTE job displacements in the footwear scenario represent the second greatest amount within any of the peak tariff sectors–23 percent of the job displacements across all seven groupings.

Labor Adjustments

If all significant U.S. import restraints had been unilaterally removed in 1999, an estimated 175,000 workers would have lost jobs in their specific sectors. Approximately 155,000 of these workers would be in the textile and apparel sectors. The estimated one-time increase in workers receiving unemployment compensation as a result of removing all significant import restraints would be approximately 110,000, roughly equivalent to about two days' of new unemployment claims. About 17,400 additional workers are anticipated to be drawn into the labor market as a result of such liberalizations. If trade policy changes were phased in gradually, the effect on aggregate U.S. unemployment of adopting such a policy likely would be too small to measure.

Potential costs of this transition include lost income during unemployment, unemployment insurance, other transitional assistance, and potential loss of the value of training and experience for workers who switch industries. On average, workers displaced as a result of unilateral U.S. liberalization of all significant import restraints likely would experience longer spells of unemployment than other displaced workers. They ae expected to receive modestly higher wages in their new jobs, though these increases likely would be less than for displaced workers in the economy as a whole. Approximately 10 percent of such workers likely would experience wage drops of more than 20 percent in their new jobs, a percentage comparable to that for displaced workers economywide. The workers displaced by unilateral trade liberalization likely would be concentrated in the Southeast, particularly in the Carolinas. Relative to other displaced workers, they would more likely be female, belong to minority groups, be older, less educated, and less likely to relocate after displacement. Differences in outcomes may be driven more by worker characteristics (e.g. age, job tenure, education, sex, marital status, race/ethnicity) than by the type of industry where the worker is employed.

CHAPTER 1
Introduction

Scope of the Study

This study updates the USITC reports that were transmitted to the United States Trade Representative (USTR) in 1993, 1995, and 1999.[1] The study provides a quantitative assessment of the effect of significant U.S. import restraints on U.S. consumers and on the net economic welfare of the United States. These import restraints include tariffs, TRQs, remedies for section 201 investigations, and nontariff measures (NTMs), such as quotas.[2] Two features differentiate this study from previous updates: first, this study includes a more comprehensive coverage of existing NTMs; and second, a new chapter is devoted exclusively to understanding the labor transition experiences incurred when import restraints are eliminated.

The analysis includes an economywide assessment of the effects of simultaneously liberalizing all of the sectors covered by significant import restraints and liberalizing each sector individually. The report estimates the effects of each sector's restraints on the value of output (domestic production),

---

[1] See USITC, *The Economic Effects of Significant U.S. Import Restraints: Second Update*, Publication 3201, June 1999; USITC, *The Economic Effects of Significant U.S. Import Restraints: First Biennial Update*, Publication 2935, December 1995; and USITC, *The Economic Effects of Significant U.S. Import Restraints,* Publication 2699, November 1993. Previous USITC studies requested by the U.S. Congress addressed liberalizing significant U.S. import restraints on a sector-by-sector basis in manufacturing, agriculture, and services, respectively. These reports are USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase I: Manufacturing*, Publication 2222, October 1989; USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase II: Agricultural Products and Natural Resources*, Publication 2314, September 1990; and USITC, *The Economic Effects of Significant U.S. Import Restraints, Phase III: Services*, Publication 2422, September 1991.

[2] This report excludes, as requested by the USTR, all import restraints resulting from final antidumping or countervailing duty investigations, section 337 or 406 investigations, or section 301 actions (see appendix A). Under WTO rules, no quotas, voluntary restraint agreements, or voluntary export restraints against other WTO members are permitted, with the exception of trade in textiles and apparel, administered under the WTO Agreement on Textiles and Clothing or limited safeguard actions.

domestic employment levels, and the value of exports and imports. Effects on consumers occur through real price and income changes that are measured as changes in net welfare.[3]

The USTR asked the Commission to provide quantitative assessments of the effects of significant import restraints using partial equilibrium and general equilibrium frameworks.[4] All estimated economic effects are derived from either CGE or partial equilibrium models.

The base year for this study is 1999. Consequently, this analysis examines domestic import restraints in effect during 1999. The report uses the same definition of significant import restraints used in the previous update. Specifically, if the quantity of imports is substantially less than the quantity specified by a quota,[5] then the quota does not affect the price of imports and is considered nonbinding.[6]

During 1999, the restraints on certain U.S. imports in place included: quotas on certain textiles and apparel pursuant to the WTO ATC and bilateral agreements with non-WTO member countries; TRQs on beef, cotton, dairy products, peanuts, tobacco, olives, ethyl alcohol for fuel use, canned tuna, and sugar and sugar-containing products; remedies in effect under section 201 investigations on lamb meat and wheat gluten;[7] restrictions on trucking; and the ban on the importation of maritime cabotage services.[8] The methodology used in selecting high-tariff sectors for this study is consistent with the methodology in the last report.[9]

---

[3] Consistent with the standard general equilibrium approach, the model used in these analyses only indicate real (relative) prices. One should not infer from these real price changes a particular impact on posted nominal prices of retail products. In general, nominal prices are influenced by monetary phenomena beyond the scope of these analyses.

[4] For a more comprehensive discussion of general and partial equilibrium models, see appendix D.

[5] For ease of presentation, the discussion focuses on the effects of a quota. However, the same discussion applies to a TRQ when it restricts imports to the quota level. In such a case, quotas and TRQs are equivalent.

[6] Conversely, if the quantity of imports is actually restricted by the barrier in place, the quota does affect the price of imports and is said to be binding.

[7] The restraints on wheat gluten and lamb meat that were subsequently lifted by the President on June 1, 2001 and Nov. 15, 2001, respectively, were in effect during 1999 and therefore are included in the study.

[8] Cabotage is a term used in the transport industry to indicate the carriage of products or people between two points within a country.

[9] For a more detailed discussion of methodology, see chapter 6.

Approach of the Study

For this study, a CGE model is the primary tool used to estimate the economywide and sectoral effects of import restraints for most sectors. The model is based on a system of equations that are consistent with the USDOC BEA input-output table for the U.S. economy. For some sectors, using the CGE model analysis is impractical; sometimes, a sector with a restraint is very small relative to a full BEA sector. For those few exceptions, a partial equilibrium framework is used.

A central assumption in many general equilibrium analyses is that production exhibits *constant returns to scale*. This assumption results in an almost horizontal domestic supply curve for a given product, which means that price changes tend to have minimal effects on supply when the domestic product has a large market share. In contrast, the pervasive assumption in partial equilibrium modeling is that production exhibits *decreasing returns to scale*. These differing assumptions are rooted in the fundamentally different questions asked of each model. Partial equilibrium models generally are used to simulate current policy changes on a specific market. In these cases, an upward-sloping supply curve is appropriate because the analysis covers a limited time horizon. Comparative static welfare analysis in general equilibrium models is usually focused on simulating an alternative equilibrium in which all resources have adjusted to their most productive uses. This perspective requires long-run supply elasticities, which are reflected in the horizontal supply curve.

In general equilibrium analysis, decreasing returns to scale (represented by an upward-sloping supply curve) is a non-standard assumption, that would imply that long-run unit costs decrease significantly in import-competing industries following trade liberalization. Implicitly, this is the assumption embedded in significantly upward-sloping supply curves applied to these industries. Because this current analysis focuses on long-run effects, most of the price changes are relatively modest, which reflects more constant returns to scale.

Both the partial and general equilibrium approaches analyze the removal of tariffs, TRQs, and NTMs as a reduction in the cost of imports in the protected sector. The resulting decline in import prices in the protected sector simultaneously induces an increase in the quantity of imports demanded and a reduction in the demand for the competing domestic product. The primary effect of removing U.S. import restraints, therefore, is a decline in domestic production and industry employment.

This analysis addresses the USTR's request for a quantitative assessment of the overall impact of removing significant U.S. import restraints. The overall effect of import relief is obtained by simultaneously liberalizing the 1999 level of sectoral protection for all sectors identified as having significant import barriers. These results are reported in chapter 2.

Estimates of the overall effects are derived from the USITC CGE model, which explicitly accounts for linkages among all sectors in the economy. This model allows the liberalization in one sector to affect all other sectors, including other liberalized sectors. Therefore, the results reported in table 2-3 cannot be equated to the results of other experiments in which trade barriers are liberalized within individual sectors. Results of single-sector experiments are reported in the chapters dealing with import restraints in specific sectors. The model results in chapter 2 account for cross-commodity interactions across sectors. The interaction between sectors that results from simultaneous liberalization may produce changes in output, employment, imports, or exports of a different direction than those reported in the individual sector analyses. All changes in imports, exports, and output are reported in value terms. Goods are evaluated at 1999 prices, as they were before simulating the elimination of import restraints. Imports are reported on a cost, insurance, and freight (c.i.f.) basis.

In the USITC CGE model, firm income is transferred to the household sector through wages and rents from capital use.[10] Due to the relationship between firms and the household sector, factor price changes influence consumer income. Likewise, when the government receives smaller revenues due to tariff cuts, the loss is offset by a lump sum tax on the household sector.[11]

Several economic factors are responsible for the welfare effects associated with the removal of import barriers.[12] First, as the significant import restraints are lifted, capital and labor move from less productive sectors into sectors that can more effectively use these production inputs. Second, consumers and producers that use products formerly subject to import restraints will benefit from lower real prices for imported goods, thereby increasing their purchasing power.[13] Third, domestic welfare increases with the removal of the quota rents

[10] The household sector is defined as the sector that owns all the factors of production (capital and labor) and purchases all final consumption.

[11] This adjustment allows for consistent welfare analysis assuming separable private and public consumption.

[12] In this study, economic welfare is a measure of economywide well-being that is consistent with economic theory. The experiments measure all the changes in welfare resulting from the removal of significant import restraints. Lower import prices reduce consumption costs that households pay for final products (relative to household income levels), as well as the production costs of firms that buy cheaper intermediate inputs. Welfare also encompasses the costs of increased import competition in industries that contract as a result of liberalization, and tariff revenue losses to government. Welfare also includes changes in the U.S. position in the world economy through changes in the terms of trade. The reported changes in welfare should be interpreted as comprehensive within the limits of the model framework.

[13] Consistent with the standard general equilibrium approach, the model used in these analyses only indicate real (relative) prices. One should not infer from these real price changes a particular impact on posted nominal prices of retail products. In general, nominal prices are influenced by monetary phenomenon beyond the scope of these analyses.

that are no longer transferred from U.S. purchasers to the foreign and domestic firms and individuals that had received those import rents. For example, quota rents occur when exporting countries enjoy preferential market access, which allows those countries to receive higher domestic prices in quota-restricted import markets. The additional revenue captured in this way is a "quota rent." For quota-rent payments, the extent to which transfers to foreigners are eliminated is especially important because this represents a component of expenditure for which there is no domestic income or consumption of goods or services.

Liberalization of all significant import restraints has other effects as well. These include displacement of employment as imports replace domestic production in some sectors. If previously protected sectors decline, their upstream suppliers may also experience adverse effects as a result of diminished demand. The USITC CGE model captures and reflects the interactions between upstream and downstream sectors as well as cross-sectoral links in the estimated effects.

USITC CGE Model

The basic modeling framework is similar to that used in previous reports. Since the previous import restraint study, however, many improvements have been made to the model that enhance the USITC analysis. One important improvement is that the current model allows for labor supply responses to changes in real wage rates. Moreover, the database and parameters used in the model have been updated. Technical details are outlined in appendix D. The Commission uses the model to quantify the expected economic effects of removing significant trade barriers such as tariffs, quotas, and TRQs.

Basic Structure

Consistent with all CGE models, the USITC CGE model estimates both economywide and sector-specific results. In subsequent chapters, the Commission examines how the individual sectors react to policy liberalization in employment, output, imports, and exports for the liberalized sectors and corresponding upstream and downstream sectors. Unlike previous reports, total employment is no longer fixed. The supply of labor now responds to changes in the wage rate and other market conditions.[14]

[14] The household considers both consumption and leisure in its utility function. As the wage rises, goods and services become relatively cheaper compared to leisure, so labor supply increases and leisure demand falls. Changes to the consumer price of goods likewise affect the labor-leisure choice. For more detail on labor-leisure choice and the labor supply function, see appendix D.

Information on net welfare reported in subsequent chapters represents the sum of welfare gains and losses accruing to U.S. households as a result of a trade policy change. Essentially, a gain or loss in net welfare represents how much income would be needed to make households as well off without the trade liberalization as they would be with the trade liberalization.

The reader should be mindful that the estimates obtained from the CGE model emphasize the effect of import restraint removal *in isolation* from all other factors that affect the economy, such as U.S. monetary and fiscal policies and trade policies in foreign countries. In addition, the results do not incorporate expected future changes in the economic variables analyzed. Therefore, estimates in this analysis are *not* forecasts. Finally, the CGE model used is a static model that assesses the impact of trade policy changes at one point in time. Consequently, capturing dynamic effects that may result from trade liberalization–such as an increase in the rate of U.S. economic growth–are not captured with the model.

Data

The model uses a 73-sector data aggregation based on the 497-sector U.S. model data base. The current aggregation consists of 38 import restraint sectors as well as 35 upstream and downstream sectors. The study employs a consistent aggregation for all simulations, allowing for greater comparability between different simulation experiments. The results in the report, however, are not presented for the full 73-sector aggregation. Rather, the results for focus sectors and groupings are reported, while other sectoral results are aggregated to broad categories to improve readability. More detail on the model, database, and price wedges is included in appendix D.

Organization of the Report

Chapter 2 presents the results of liberalizing all significant import restraints in place during 1999 that are individually discussed in the following chapters. The discussion highlights economywide effects of trade liberalization for significant trade barriers.

Chapter 3 discusses the results of liberalizing the significant tariff and nontariff measures in the manufacturing sector. These include the ATC, bilateral textile agreements, and high tariffs on the textile and apparel sectors.

Chapter 4 presents the significant tariff and nontariff measures in the agricultural sector. These restrictions include TRQs on the dairy products, peanut, sugar, cigarette tobacco, beef, ethyl alcohol for fuel use, canned tuna, and cotton sectors. This chapter also analyzes restrictions on lamb meat and wheat gluten resulting from safeguard actions.

Chapter 5 describes the quantitative restrictions in the services sector, primarily the restrictions placed on maritime transport services under the Merchant Marine Act of 1920, commonly referred to as the Jones Act. Also,

this chapter provides discussion of other service sectors including trucking, air transport, and financial services.

Chapter 6 presents the approach used to identify peak tariff sectors and covers the following 7 sectors individually: frozen fruits, fruit juices, and vegetables; footwear; ceramic wall and floor tile; table and kitchenware; ball and roller bearings; watches, clocks, watchcases, and parts; and costume jewelry. The chapter also examines the effect of removing all restraints in these peak sectors simultaneously.

Chapter 7 discusses the potential impact of changes in trade policies on U.S. workers. Factors such as the demographic and geographic characteristics of displaced workers, the length of time it takes workers displaced by trade liberalization to find new jobs and how the experience of workers affected by liberalization compares to that of other displaced workers are examined. The chapter draws an empirical picture of job displacement related to trade liberalization.

CHAPTER 2
Simultaneous Changes in all Significant U.S. Import Restraints

Unlike chapters 3 to 6 of this study which analyze the effects of all significant U.S. import restraints by looking at the restraints individually, this chapter examines effects of removing these import restraints all at once, as they stood in 1999. A major theme of the analytical approach taken here is that the U.S. economy and that of the world as a whole is unified, and all of its parts are related. General equilibrium modeling attempts to portray this underlying unity of the economy and the interrelation of its parts. For example, policies that affect agricultural imports also affect the processed food industries and other users of agricultural products. Agricultural policies also affect chemical industries that make fertilizers, and the textiles, apparel, mining, and service industries that supply goods to agricultural workers or that compete with agriculture for resources.

This chapter presents an overview of the effect that simultaneous removal of trade restraints has on the economy as a whole. The results reported in this chapter are not strictly comparable to those reported in the following chapters. For example, the output and employment effects reported for cotton in table 2-3 are an estimate of what happens to cotton when all significant import restraints are eliminated, including the restraints on imports of textiles and apparel. In contrast, the results reported in chapter 4 for cotton are an indication of what would happen to the cotton industry if only its own tariff barriers were removed.

The analysis in this chapter proceeds in two stages. First, the chapter examines the aggregate effects of the significant import restraints relative to the effects of all known import restraints, or at least all that can be identified and quantified in terms amenable to analysis with the model used here. Second, the chapter examines in more detail the effects of removing the significant import restraints that are individually examined in subsequent chapters of this study.

Identification of Significant Import Restraints

This study identifies 34 sectors in the U.S. economy with significant import restraints.[1] In many cases, the sectors are defined more broadly than would be desired for a precise measure of the effects of import restraints. For example, the cotton sector includes cotton of many grades, only some of which are subject to significant barriers. These barriers are calculated from price gaps as high as 16.9 percent (see chapter 4). Because most cotton is imported without significant barriers, the average duty and tariff equivalent of the import barriers for cotton as an aggregate appear low in table 2-1. Similarly, the sugar-containing products classification contains many items containing large amounts of sugar, which are subject to significant import restrictions, but these products make up a small fraction of all imports under the sugar-containing products heading; thus, the average duty reported appears relatively small.

The import restraints reported in table 2-1 are both quantity restrictions and high tariffs. Table 2-1 lists the sectors that contain products that were subject to significant import restraints in 1999, except for ethyl alcohol, canned tuna, wheat gluten, lamb meat, and peanuts, which are not covered by the CGE analysis. The first 12 sectors listed in table 2-1 are textile, apparel, and other sectors subject to protection under the WTO Agreement on Textiles and Clothing (ATC), and various bilateral agreements, as described in chapter 3. Next are the 14 food and agricultural sectors that are subject to tariff rate quotas and other barriers as described in chapter 4. Merchant shipping between U.S. ports is protected by the Merchant Marine Act of 1920 and other laws, commonly known as the Jones Act; these import restraints are discussed in chapter 5. Another seven sectors are protected by exceptionally high Normal Trade Relations (NTR) tariffs.[2] Finally, the rest of the economy is aggregated into the seven reference sectors listed at the bottom of the table.[3] Table 2-1 shows the average NTR tariff, the export tax or tariff equivalent of sectors with nontariff measures, and the rent generated by the non-tariff trade

[1] Sectors are principally defined in terms of the benchmark input-output tables of the Bureau of Economic Analysis. These sectors roughly correspond to one or more SIC 87 codes at the 4-digit level. See: USDOC, BEA, *Benchmark Input-Output Accounts of the United States, 1992* (Washington, DC: U.S. Government Printing Office, September 1998).

[2] Normal Trade Relations tariffs were formerly known as most-favored-nation tariffs. These are the tariffs applied to most imports, with the exception of lower tariffs for qualifying imports from countries eligible for tariff preference programs. Only six countries are subject to higher tariffs under column 2 rates. The Harmonized Tariff Schedule of the United States does not reflect trade embargoes.

[3] Industries in these seven reference sectors are covered by generally low tariffs, as indicated in the table; these tariffs are not considered significant as defined by the terms of this study.

Table 2-1
Significant U.S. import restraints, by sectors, 1999

USITC sector[1]	Calculated AVE tariff rate[2]		Export tax or tariff equivalent[3]	Quota rents
	Average	Peak		
	Percent			*Million dollars*
ATC sectors:				
Apparel, includes only apparel made from purchased materials	11.7	31.8	21.4	10,025
Broadwoven fabric mills	8.9	46.7	2.3	84
Carpets and rugs	3.5	8.5	1.4	18
Home furnishings, including curtains and draperies	6.4	21.1	7.3	223
Knit fabric mills	8.5	17.1	([4])	([4])
Miscellaneous textile goods	2.2	15.2	0.1	1
Narrow fabric mills	4.9	8.7	0.4	2
Yarn and thread mills	5.1	12.6	0.5	4
Other fabricated textile products	3.1	13.6	1.5	40
Luggage, handbags, purses, and other leather goods	12.9	17.8	7.3	299
Leather gloves	12.7	13.4	([4])	([4])
Man-made fibers	4.3	9.2	0.1	2
Agricultural sectors:				
Butter	42.7	106.6	10.2	3
Cheese	10.1	88.1	15.0	96
Dry/condensed milk products	0.7	107.0	0.7	4
Fluid milk	7.3	38.8	([4])	([4])
Ice cream	17.6	33.5	([4])	([4])
Cane and beet sugar and other related products[6]	1.1	93.3	82.7	334
Sugar-containing products	1.3	101.2	0.1	2.4
Cotton, including carded or combed, and cotton waste and byproduct	0.6	11.1	2.0	4
Tobacco stemming and redrying	8.8	78.9	0.0	([4])
Cigarettes	9.5	10.0	0.0	
Maritime transportation	([7])	([7])	[5]59.0	([7])

See footnotes at end of table.

Table 2-1—*Continued*
Significant U.S. import restraints, by sectors, 1999

USITC sector[1]	Calculated AVE tariff rate[2]		Export tax or tariff equivalent[3]	Quota rents
	Average	Peak		
	Percent			*Million dollars*
High tariff sectors:				
Ceramic wall and floor tile	11.4	13.0	0.0	([4])
China tableware	7.0	27.6	([4])	([4])
Footwear	10.7	55.9	([4])	([4])
Frozen fruit, fruit juices, and vegetables	7.8	50.2	([4])	([4])
Bearings	6.0	9.1	([4])	([4])
Timepieces	5.3	31.0	([4])	([4])
Costume jewelry	6.4	10.6	([4])	([4])
Reference sectors:				
Agriculture and food	0.4	([7])	([4])	([4])
Durable manufactures	0.8	([7])	([4])	([4])
Nondurable manufactures	1.1	([7])	([4])	([4])
Finance, insurance, real estate	0.4	([7])	([4])	([4])
Mining	0.2	([7])	([4])	([4])
Services	0.4	([7])	([4])	([4])
Transport and communication	0.4	([7])	([4])	([4])

[1] Sectors are defined in terms of the BEA input-output structure, and in some cases may include related goods other than those subject to significant import restraints. Tariffs and the tariff and tax equivalents are trade-weighted averages for all goods in the sector, and are thus understated in terms of more narrowly defined goods subject to significant import restraints.

[2] Ad valorem equivalent tariff rate, c.i.f. basis, concorded specifically for the USITC CGE model.

[3] Tariff equivalent quota premium rate of quantity restrictions, or export tax equivalent for textiles and apparel. Tariff equivalents are generally calculated as price gaps, the difference between world market prices and the domestic market prices of imported goods. See chapters 3 and 4 for details.

[4] Not available.

[5] Cost advantage held by potential foreign suppliers as a percent of U.S. cost. See chapter 5 for more information.

[6] Cane and beet sugar: syrups and sugar-containing products derived from cane or beet sugar and other sugars and sugar syrups.

[7] Not applicable.

Source: Ad valorem tariff equivalents compiled from USDOC official statistics. USITC estimates and calculations include tariff equivalents or export tax equivalents of the quotas and quota rents.

restrictions.[4] In addition, the table shows the high or peak tariffs that apply to particular goods within each commodity aggregation. For example, apparel products have an average NTR duty rate of 11.6 percent ad valorem, but some apparel items within this aggregate have a duty rate as high as 31.8 percent.

The export tax or tariff equivalents are estimates of the tax or tariff equivalents of TRQs and nontariff measures or quota restrictions that were in effect in 1999. Export tax equivalents for textile and apparel products are found by an analysis of quota license prices, as reported in chapter 3. For agricultural goods, the principal methodology is the price-gap method, which measures the difference between the U.S. market price of a product and the world price of the product. Tariffs, transportation costs, or other transaction costs may account for some differences between the two prices. Any remaining price difference is then attributed to the import restraint and evaluated as a tax or tariff equivalent in terms of an ad valorem percentage of the dutiable import value of the product. Many quotas and quantity restrictions, including those on textiles and apparel, are administered by the exporting countries. Thus their estimated ad valorem equivalents are more properly compared to export taxes than to tariffs. Because the USITC CGE model treats goods in sectors at a level of aggregation that is broader than the lines defined in the import classification system, in some cases products subject to nontariff measures make up a small portion of the model sector. Therefore, the tax and tariff equivalents reported in table 2-1 are trade-weighted, and understate the actual import restraint on trade in more narrowly specified sectors. See appendix D, and table D-2, for a description of the calculation of the tax and tariff equivalent for some of the aggregate sectors and its relationship to observed price effects of nontariff barriers.

Economywide Effects of Removing U.S. Import Restraints

The effect of significant import restraints is measured by simulating their removal and comparing the values of certain economic variables in the absence of the import restraints with the values of these variables in the presence of the restraints. This section assesses the relative significance of the designated restraints by comparing the effects of their elimination with the effects of the elimination of all (measured) import restraints.[5]

[4] Economic rent in the context of an import quantity restriction refers to profits accruing to owners of quota trading rights. These profits are derived from the higher prices that occur because the quantity restriction induces artificial scarcity in the market.

[5] In this context, the difference between "significant" and "all" import restraints consists of measured tariff barriers in sectors other than those considered to be significant, i.e. the tariffs listed in table 2-1 as they are applied to the reference sectors of the economy. In principle, this comparison does not account for the effects of any quantitative restrictions applied to goods in the reference sectors, although any

The USITC CGE model simulates the removal of import restraints. This model accounts for interconnections among sectors and agents in the economy, so that elimination of import restraints in any sector affects all other sectors. Therefore, results found from an experiment in which restraints for many sectors are removed are not equivalent to adding up the results from experiments eliminating the restraints individually. Individual sector simulations and results are found in the following 4 chapters of this report.[6]

Table 2-2 compares the values of certain aggregate variables under removal of all measured restraints (case 1) and removal of designated significant restraints (case 2). Under case 1's total unilateral trade liberalization, the economy gains some 35,000 full-time equivalent (FTE) job slots, from new workers in the labor force or additional time on the job for workers already in the labor force. Under the significant restraints scenario of case 2, the comparable figure is slightly less than half that number, about 17,000 full-time equivalent jobs. These figures represent very small fractions of full-time equivalent positions in the labor force, about 0.03 percent for case 1 and 0.01 percent for case 2.

Table 2-2
Aggregate economic effects of simultaneous liberalization of all import restraints, and significant import restraints, 1999

Effect on	Removing all measured trade restraints (case 1)		Removing designated significant restraints (case 2)	
		Percent		*Percent*
Employment *(full time equivalents)*	35,320	([1])	17,370	([1])
Total output *(million dollars)*	59,702	0.4	58,814	0.4
Imports *(million dollars)* . . .	29,395	2.4	20,656	1.7
Exports *(million dollars)* . . .	15,429	1.6	7,849	0.8
Change in Welfare *(billion dollars)*	14.480	0.2	14.350	0.2

[1] Less than 0.05 percent in absolute value.

[2] Aggregate figures in this table are reported in consistent real units. The numeraire is the true cost-of-living index. Itemized changes in output, imports and exports that appear elsewhere in this report are in real commodity-specific units, evaluated at base-year prices. Percentage changes in these itemized results represent the percentage change in quantity.

Source: USITC estimates. Output, exports, imports, and the welfare measure are reported in terms of prices prevailing before the elimination of import restraints.

[5]—*Continued*
quantitative restriction the Commission was able to identify and quantify was designated as significant. Further, this comparison also does not consider any measures that fall outside of the terms of reference of this study. Examples include remedies in antidumping and countervailing duty cases, section 337 or 406 investigations, or section 301 actions.

[6] The individual simulations in chapters 3 through 6 show results of eliminating import restraints only in the specific commodities under consideration there, leaving all other restraints in place.

In terms of output, the significant restraints scenario (case 2) results in an increase of $58.8 billion, while the total case 1 experiment results in a somewhat larger increase of $59.7 billion.

Under both scenarios, imports and exports increase. Elimination of the significant import restraints (case 2) causes imports to increase by $20.6 billion compared to $29.4 billion for case 1. Removing all trade barriers causes exports to rise by almost twice as much as removal of the significant restraints ($15.4 billion compared to $7.8 billion).

In terms of measured welfare, the significant barrier elimination of case 2 captures almost all of the gains generated by eliminating all import restraints of case 1. These numbers should be interpreted as a measure of the value of trade liberalization to the economy as a whole. It includes all gains or losses in the economy, in terms of labor income or capital income, tax increases or decreases, as well as the consumption results of changes in the real prices economywide. Eliminating significant import restraints is thus measured as being equivalent to an increase of about $14.35 billion in economic welfare, while removing all import restraints is equivalent to a gain of about $14.48 billion.

Several factors account for these gains in economic welfare. As trade barriers are removed, capital and labor move to sectors where they can be more efficiently used.[7] Consumers and producers using products formerly subject to import restraints will generally face lower prices. The lower prices are reinforced by higher average income levels under the reallocation of capital and labor. Economywide the cost of living falls relative to average income, resulting in a net increase in welfare.[8]

Sectoral Effects of Removing All Significant U.S. Import Restraints

Table 2-3 reports more sector-level detail for the case in which only the designated significant import restraints are removed. For most sectors in which import restraints are removed (the focus sectors), sectoral production and

[7] Note that there is no elapsed time in the model. Labor and capital are not shown moving, but rather as they would be after moving. The before and after of trade barrier removal is really a comparison of two different economic pictures, one with trade barriers and one without, at a given point in time. Each economic picture is fully adjusted to its respective policy situation. Chapter 7 examines some of the transitional implications of living in an economy in which actual adjustments must be made.

[8] Consistent with the standard general equilibrium approach, the model used in these analyses only indicate real (relative) prices. One should not infer from these real price changes a particular impact on posted nominal prices of retail products. In general, nominal prices are influenced by monetary phenomenon beyond the scope of these analyses.

Table 2-3
Economic effects of simultaneous liberalization of all significant import restraints, changes in FTE, output, trade, and prices, 1999

Sector	Employment		Output		Imports		Exports		Composite price[3]
	FTE[1]	*Percent*	*Value[2]*	*Percent*	*Value[2]*	*Percent*	*Value[2]*	*Percent*	*Percent*
ATC sectors:									
Apparel, includes only apparel made from purchased materials	-70,030	-17.1	-9,443	-17.2	12,361	26.4	-1,219	-17.1	-17.1
Broadwoven fabric mills	-32,950	-10.1	-2,556	-10.0	120	3.3	-240	-9.3	-2.2
Carpets and rugs	-460	-0.8	-111	-0.9	131	10.1	-5	-0.6	-0.5
Home furnishings, including curtains and draperies	-340	-0.9	-87	-0.9	376	12.3	-4	-0.9	-3.8
Knit fabric mills	-20,760	-26.1	-1,263	-26.1	54	5.6	-135	-24.9	-0.9
Miscellaneous textile goods	-830	-0.9	-133	-1.0	36	2.6	-17	-0.9	-0.1
Narrow fabric mills	-1,800	-9.7	-164	-9.8	-39	-7.9	-73	-9.4	-3.0
Yarn and thread mills	-11,730	-10.5	-1,323	-10.5	-28	-3.8	-61	-9.7	-0.6
Other fabricated textile products	-5,680	-6.1	-175	-6.3	65	2.5	-87	-5.3	-2.5
Luggage, handbags, purses, and other leather goods	-4,520	-29.6	-553	-29.7	899	21.9	-86	-25.9	-13.3
Leather gloves	-80	-5.6	-8	-5.6	17	9.9	([4])	-3.9	-6.4
Man-made fibers	-5,770	-5.4	-699	-5.5	-42	-2.5	-111	-6.2	-0.2
Agricultural sectors:									
Butter	-30	-1.6	-17	-1.6	17	53.8	([4])	-0.6	-1.2
Cheese	-160	-0.4	-118	-0.6	141	22.0	([4])	-0.3	-0.6
Dry/condensed milk products	20	0.1	-3	([5])	12	2.0	([4])	0.1	0.3
Fluid milk	130	0.2	16	0.1	2	6.9	([4])	0.3	0.4
Ice cream	-20	-0.1	-13	-0.2	12	29.4	([4])	0.1	0.2
Cane and beet sugar and other related products[6]	-2,350	- 9.2	-743	- 9.3	434	107.5	-11	-7.2	-5.8
Sugar-containing products	70	0.1	-26	-0.1	76	1.7	6	0.2	0.1
Cotton, including carded and combed, waste and byproduct	-2,700	-7.5	-387	-7.6	-9	-4.8	-31	-2.9	-0.1
Tobacco stemming and redrying	-100	-2.4	-60	-2.6	53	12.0	-8	-0.6	-0.5
Cigarettes	10	([5])	-18	([5])	27	22.8	2	0.1	0.4

Maritime transportation	-6,200	-3.3	-1,237	-3.3	1,502	([7])	155	0.9	-0.6
Shipbuilding	-3,010	-2.9	-390	-3.0	-7	-3.2	-26	-2.8	0.4
High MFN tariff sectors:									
Ceramic wall and floor tile	-900	-11.1	-77	-11.2	71	5.9	-3	-10.5	-6.4
China tableware	-490	-8.3	-48	-8.4	49	6.0	-5	-8.1	-3.7
Footwear	-1,340	-3.5	-188	-3.6	984	6.9	-7	-1.7	-6.8
Frozen fruit, fruit juices, and vegetables	-1,530	-3.7	-341	-3.8	309	21.9	-31	-2.9	-0.9
Bearings	-840	-1.4	-147	-1.5	120	8.2	-14	-1.4	-0.6
Timepieces	-120	-2.9	-24	-2.9	114	3.7	-8	-2.6	-3.9
Costume jewelry	-10	-0.1	-3	-0.2	40	5.5	([4])	-0.2	-1.5
Rest of the economy:									
Agriculture and food	2,210	0.2	47	([5])	-131	-0.6	159	1.0	0.4
Construction	6,970	0.1	140	([5])	([8])	([8])	([8])	0.1	0.4
Durable manufactures	46,690	0.4	9,189	0.3	-3,161	-0.4	2,188	0.5	0.4
Finance, insurance, real estate	12,000	0.2	1,312	0.1	-60	-0.4	75	0.3	0.4
Mining	1,710	0.3	421	0.2	-171	-0.4	20	0.4	0.5
Rest of the economy:									
Nondurable manufactures	10,910	0.2	1,368	0.1	-817	-0.6	205	0.2	0.4
Services, other	69,330	0.1	1,320	([5])	-139	-0.3	182	0.1	0.4
Transport and communications, and utilities	10,060	0.1	406	([5])	-541	-0.4	165	0.3	0.4
Wholesale and retail trade	32,010	0.1	514	([5])	([8])	([8])	240	0.3	0.4

[1] Full-time equivalents.
[2] In millions of dollars in base year prices.
[3] Price of the composite good (i.e. imports and domestic production).
[4] Change less than $500,000 in absolute value or nontraded sector.
[5] Change less than 0.05 percent.
[6] Cane and beet sugar: syrups and sugar-containing products derived from cane or beet sugar and other sugars and sugar syrups.
[7] Jones Act maritime shipping is nontraded before elimination of import restraint.
[8] Nontraded sector.

Source: USITC estimates.

employment decline and imports rise. The rest of the economy benefits, with increased output and employment in other sectors and increased economic welfare. Composite prices–a weighted average of imported and domestically produced goods–generally fall for production in which import restraints are removed, and a rise for the others. All price changes are relative to a general cost-of-living index.[9]

Focus Sectors

The immediate effect of removing import restraints on the focus sectors is a reduction in the relative price of the imported goods and services. This price change results in increased sales of imports at the expense of competing domestic products. However, many sectors have important upstream and downstream linkages that can intensify or weaken the primary effects.

When all significant import restraints are eliminated in the case 2 scenario, domestic output in most of the textile and apparel sectors drops, quite considerably in some cases. The largest percentage declines are in the apparel and knit fabric mills sectors. For apparel, this is in part due to the high import barriers.[10] For the knit fabric mills, the tariff is lower, so the primary effect of the tariff reduction might be expected to be smaller than for the case of apparel. The fabric mills produce inputs to apparel and suffer a secondary hit as demand for their output drops. For narrow fabric mills, manmade fibers and yarn and thread mills, which have high import barriers and are used by downstream production sectors, the effect of declining demand by the downstream sectors is apparently strong enough to also cause imports of the commodities to decline.

Agricultural products also are strongly affected by the elimination of significant import restraints. Imports of several agriculture products face TRQs. In this chapter, the Commission explicitly modeled dairy products, sugar, cotton, and tobacco. However, peanuts, lamb meat, ethyl alcohol, canned tuna, and wheat gluten sectors are not considered in the economywide liberalization. Although fluid milk, ice cream, butter, and cheese have high import barriers, domestic output is relatively insensitive to removal of these barriers. This result is due to relatively small import shares, because of the perishable nature of many dairy products examined. Under simultaneous liberalization, sugar output falls significantly, tobacco output falls slightly, and imports of both sectors increase significantly. In contrast, the sugar-containing products sector faced little change. Cotton output declined when all import restraints are removed economywide, not solely due to direct import competition, but also due to the decline of the also-liberated textile and apparel industries.

[9] Composite prices appropriately averaged real prices for all goods in a sector, both imported and domestically produced, purchased either as final consumption goods or as inputs to the production of other goods. See details on the import-domestic composite goods in appendix D.

[10] Apparel has a duty of 11.6 percent and ATC quotas tax equivalent to 21.4 percent; see table 2-1.

The results for cotton highlight a particular limitation of the USITC CGE model. The model is a one-country model, containing a very detailed treatment of the industry sectors in the U.S. economy, but no sectoral detail on foreign production and demand. In particular, the elimination of import restraints in textiles and apparel result in a significant increase in U.S. imports of these products. Many of these products are made overseas using cotton and other fibers exported from the United States, so one might expect a full global model to show an increase in U.S. exports of cotton due to an increase in output by foreign suppliers of fabric and clothing, who rely on American cotton. The current version of the USITC CGE model is not equipped to show this kind of link.

Sectors with high NTR tariffs uniformly show the expected patterns of declining domestic production, employment, exports, and prices, along with increases in imports, when these tariffs are eliminated. The highest tariffs, aside from those in the textile, apparel, and agricultural sectors, are found in the ceramic tile and footwear sectors. These sectors experience the strongest effects from tariff removal.

Rest of the U.S. Economy

Table 2-3 shows effects on the nine aggregate reference sectors comprising the rest of the economy. The relatively small tariffs in these sectors are not eliminated in this scenario, since these are not considered significant trade barriers, so the trade effects depend on their relation to the focus sectors. More importantly, however, the effects depend on movements in aggregate factors such as movements in the terms of trade (as the price of imports and import-competing products falls relative to other goods), and on the increased availability of labor and capital.

Thus, when import restraints are lifted, the rest of the economy experiences output gains, due to lower prices for some inputs and to increased demand from foreign and domestic customers. The output gains are accompanied by employment gains in the nine reference sectors. The biggest absolute gains are in the services sector, while the largest proportional output gain is in durable manufacturing.

CHAPTER 3
Textiles and Apparel

In 1999, total U.S. output of textiles and apparel was $151.1 billion, or 1 percent of the value of U.S. gross output, with employment of 1.35 million workers, or 1 percent of U.S. employment (table 3-1).[1] Imports of textiles and apparel were $67.0 billion, or 44 percent of the value of U.S. shipments.[2] Total U.S. exports were $18.5 billion, or 12.2 percent of domestic shipments. Unlike many other sectors within manufacturing, U.S. imports of textiles and apparel were subject to relatively high *ad valorem* tariffs – 6.6 percent for textiles and 11.7 percent for apparel.[3] In addition, trade in these products was governed by various bilateral and multilateral agreements that use quantitative restrictions (QRs) to control import flows. Based on estimates in this study, these QRs were equivalent to average export taxes of 3.3 percent on textile imports and 21.4 percent on apparel imports in 1999.[4] Simulation results suggest U.S. welfare would have risen by about $13 billion annually had these tariffs and QRs been removed.

This chapter begins with a description of U.S. market access provisions for textiles and apparel. The second part provides a brief review of previous research on the welfare effects of removal of these barriers. Part three presents estimates of the export tax equivalents of the 1999 QRs, as well as a discussion of estimation methods and limitations. The final two parts focus on the simulated removal of the tariffs and QRs on textile and apparel imports. A brief discussion of model specification is given, followed by an evaluation of the potential effects of trade liberalization in these sectors on U.S. net welfare, as well as on U.S. consumption, production, and employment.

[1] These data are compiled from official data of the USDOC.

[2] The product groups in table 3-1 are defined by the BEA as described in chapter 2. The product group "apparel" includes cut pieces which are exported, sewn into garments and reimported. Thus, the values for shipments, imports, and exports do not represent finished apparel products alone. As a result, the ratio of imports to U.S. shipments of 44 percent, as noted above, understates the portion of the U.S. market for *finished* apparel that is captured by imports.

[3] U.S. tariff treatment is discussed in more detail in the following section. Use of the descriptor *ad valorem* includes *ad valorem* equivalent rates.

[4] Procedures used to derive these estimates are discussed in the third part of this section, and in detail in Appendix E.

Table 3-1
Textiles and apparel: Summary data, 1999

Sector	Employment	Shipments	Imports	Exports
	1,000 workers		*Million dollars*	
Textiles and Apparel:[1]				
Apparel[2]	409.0	54,873	46,845	7,150
Broadwoven fabric mills	325.0	24,995	3,641	2,559
Narrow fabric mills	18.5	1,673	497	783
Yarn mills and thread mills	112.3	12,549	754	624
Carpets and rugs	54.4	11,682	1,298	773
Miscellaneous textile goods	95.2	13,806	1,377	1,897
Knitting mills and knit fabric mills	79.7	4,834	965	542
Home furnishings[3]	39.8	9,211	3,054	426
Other fabricated textile products	92.2	2,786	2,651	1,635
Leather gloves	1.4	147	175	7
Other restricted products:				
Luggage, handbags, purses, and other personal leather items	15.3	1,866	4,099	330
Man–made fibers	106.6	12,706	1,633	1,780
Total	1,349.4	151,128	66,989	18,506

[1] Product groups defined in Appendix D. A concordance between BEA input-output categories and SIC categories for textiles and apparel can be found in *Import Restraints: Second Update,* USITC Publication 3201, May 1999, appendix G. The only changes from the previous report are: hosiery included in apparel; yarn and thread mills aggregated; canvas and related products included in other fabricated textile products.

[2] Includes only apparel made from purchased materials.

[3] Includes curtains and drapes.

Source: USITC estimates from USDOC official data.

Market Access Provisions

Tariff Treatment

The import-weighted average *ad valorem* tariffs applied to U.S. imports were 6.6 percent for textiles and 11.7 percent for apparel, in 1999.[5] These averages are based on the U.S. customs value of these imported products, which include dutiable imports and duty-free goods. The average *ad valorem* tariffs faced by countries that do not qualify for preferential duty treatment were significantly higher. Based on dutiable value (as opposed to customs value) of U.S. imports of textiles and apparel, the average *ad valorem* tariff

[5] The ratio of calculated duties to imports for consumption for textiles (SIC 22) and apparel (SIC 23). USITC staff calculations from official data of the USDOC.

was approximately 9.9 percent for textile imports and 15.8 percent for apparel imports in 1999.[6]

Most goods exported to the United States from Mexico and Canada in 1999 qualified for preferential duty treatment under the North American Free Trade Agreement (NAFTA), as did those imported from Israel under the U.S.-Israel Free Trade Agreement. In addition, textiles and apparel imports made chiefly of silk blends and non-cotton vegetable fibers were eligible for duty-free treatment under the Caribbean Basin Economic Recovery Act (CBERA) during 1999. Finally, some imports, primarily from CBERA countries, qualified for reduced-duty treatment under heading 9802.00.80 of the Harmonized Tariff Schedule (HTS) of the United States.[7] Under the Uruguay Round Agreement, the United States agreed to reduce its tariffs on most textile products by an average of 24 percent and on apparel products by 9 percent.[8] These reductions are to be fully phased in by January 1, 2004.

Agreement on Textiles and Clothing

The ATC entered into force as part of the WTO agreements in 1995, replacing the 1974 Multifiber Arrangement, which was negotiated under the General Agreement on Tariffs and Trade (GATT) and which permitted the use of quotas without compensation. The ATC created special interim rules governing the integration of textiles and apparel into the GATT regime. Under the ATC, the United States and the other WTO members with MFA quotas agreed to eliminate the textile and apparel quotas over a 10-year period that

---

[6] Note that import-weighting is likely to understate the size of these tariffs in both cases. Higher tariffs reduce trade flows more, and therefore, an *ex post* import weight tends to understate the amount of trade affected by the tariff. This downward bias is present whether tariffs are measured with respect to all imports or only dutiable imports. For a fuller discussion of this problem see James E. Anderson and Peter J. Neary, "Measuring the Restrictiveness of Trade Policy," *The World Bank Economic Review,* vol. 8 No. 2, 1994, pp. 151-169.

[7] Reduced-duty treatment under heading 9802.00.80 applies to apparel and other articles made from fabric that was cut in the United States and sewn abroad. In 1999, HTS heading 9802 imports of textiles and apparel from CBERA countries (primarily from the Dominican Republic, Honduras, El Salvador, Guatemala and Costa Rica) accounted for more than three-quarters of total sector imports from that region. Some of these imports also received preferential quota access. For more information regarding the various programs under which preferential tariff and/or quota treatment was granted, see USITC, *The Year in Trade: Operation of the Trade Agreements Program During 1999*, Publication 3336, August 2000.

[8] Data on U.S. tariff cuts for textile and apparel products were developed by the USDOC, Office of Textiles and Apparel, based on 1989 trade, the base year for the Uruguay Round tariff negotiations.

ends on January 1, 2005.[9] As textile and apparel articles are integrated into the GATT regime, they become subject to the same trade rules as goods of other sectors.

The ATC calls for quotas to be phased out in three stages. For the first stage (January 1, 1995), the WTO members were required to integrate at least 16 percent of textile and apparel trade into the GATT regime, based on their respective 1990 import volumes. At the same time, the ATC required these countries to implement accelerated annual growth rates for the remaining quotas, with an increase of 16 percent for the major supplier countries and 25 percent for small suppliers during the first stage.[10] For the second stage (January 1, 1998), an additional 17 percent of trade was integrated into the GATT regime and quota growth rates were increased by 25 percent for major supplier countries and 27 percent for small suppliers. For the third stage (January 1, 2002), an additional 18 percent of trade was integrated and annual growth rates for the remaining quotas were increased by 27 percent.[11] The remaining 49 percent of textile and apparel trade will be integrated on January 1, 2005.

All WTO members are subject to the requirements of the ATC and only WTO members are eligible for the ATC's benefits. As shown in Table 3-2, the United States had quotas on textiles and apparel from 48 countries in 1999, which together accounted for 84 percent of the total value of U.S. sector imports in 1999. Of the 48 countries, 38 were WTO members and the remaining 10 countries were subject to quotas imposed by the President under section 204 of the Agricultural Act of 1956.[12] The non-WTO members subject to section 204 of the Agricultural Act of 1956, led by China and Taiwan, accounted for almost 14 percent of the value of total U.S. imports of textiles and apparel in 1999.[13]

---

[9] The three WTO members with MFA quotas in 1999 were the United States, the European Union (EU), and Canada. (Norway had eliminated nearly all of its quotas as of 1998.) The ATC legal text can be obtained at *http://www.wto.org/english/docs_e/legal_e/final_e.htm.*

[10] For more details on the small suppliers, *Import Restraints: Second Update,* USITC Publication 3201, May 1999, p. 26.

[11] If the annual growth rate for a major supplier country was 6 percent prior to implementation of the ATC, the growth rate during stage one would be 6.96 percent; during stage two, 8.7 percent; and during stage three, just over 11 percent.

[12] Section 204 of the Agricultural Act of 1956 (7 U.S.C. 1854) authorizes the President to enter into agreements with foreign governments to limit the export of textiles and apparel to the United States, and the importation of such goods into the United States, and to issue regulations to carry out such agreements.

[13] China became a WTO member on Dec. 11, 2001, and Taiwan on Jan. 1, 2002. Upon accession, China and Taiwan became parties to the ATC and, therefore, subject to its rights and obligations. China and Taiwan will benefit from the third stage of integration under the ATC. Consequently, as for all WTO members, quotas on textiles

Table 3-2
Trading partners with which the United States had textile and apparel quotas in 1999, and U.S. imports of textiles and apparel from these partners in 1999

Partners	Imports	Percent of total
	Million dollars	
WTO members subject to the ATC:		
Hong Kong	4,465	7.0
South Korea	2,887	4.5
Dominican Republic	2,385	3.7
India	2,384	3.7
Honduras	2,164	3.3
Philippines	2,156	3.4
Thailand	2,074	3.3
Indonesia	1,959	3.1
Bangladesh	1,754	2.8
Pakistan	1,475	2.3
Sri Lanka	1,470	2.3
El Salvador	1,363	2.1
Guatemala	1,244	2.0
Turkey	1,183	1.9
Macau	1,047	1.6
Costa Rica	831	1.3
Malaysia	810	1.3
Egypt	424	1.0
Colombia	409	1.0
Jamaica	345	1.0
Singapore	337	1.0
United Arab Emirates	333	1.0
Mauritius	232	(1)
Myanmar (Burma)	192	(1)
Brazil	130	(1)
Qatar	114	(1)
Bahrain	100	(1)
Romania	98	(1)
Bulgaria	78	(1)
Fiji	68	(1)
Hungary	51	(1)
Kenya	39	(1)
Poland	39	(1)
Czech Republic	36	(1)
Slovenia	28	(1)
Uruguay	12	(1)
Kuwait	10	(1)
Subtotal	34,726	54.6

See footnotes at end of table.

Table 3-2—*Continued*
Trading partners with which the United States had textile and apparel quotas in 1999, and U.S. imports of textiles and apparel from these partners in 1999

Partners	Imports	Percent of total
	Million dollars	
Non-WTO members subject to section 204 of the Agricultural Act of 1956:		
China	6,129	9.6
Taiwan	2,709	4.2
Cambodia	587	1.0
Russia	166	(1)
Nepal	165	(1)
Oman	143	(1)
Former Yugoslav Republic of Macedonia	62	(1)
Ukraine	52	(1)
Belarus	46	(1)
Laos	12	(1)
Subtotal	10,071	15.8
WTO member subject to the NAFTA:		
Mexico	8,621	13.5
All other	10,325	16.2
Total	63,743	100.0

[1] Less than 0.5 percent.

Note.—The import data represent U.S. general imports of all textiles and apparel articles covered by the former MFA–that is, articles of cotton, wool, manmade fibers, vegetable fibers, and silk blends.

Source: USDOC, ITA, Office of Textiles and Apparel.

NAFTA

On January 1, 1994, the United States eliminated existing quotas on imports of textiles and apparel from Mexico that met NAFTA rules of origin.[14] The United States does not apply quotas to imports of textiles and apparel from

[13]—*Continued*
and apparel will end on Jan. 1, 2005. However, under the terms of bilateral textile agreements reached with China in Feb. 1997, U.S. imports of textiles and apparel from China would be subject to the application of a selective safeguard clause from Jan. 1, 2005 until Dec. 31, 2008. This safeguard mechanism enables WTO members to take action to curb imports in case of market disruption caused by Chinese exports of textile and apparel products.

[14] Generally, the NAFTA rules of origin require that textiles and apparel be produced in a NAFTA country from the yarn formation stage forward in order to qualify for benefits under the agreement. Certain goods assembled in Mexico from fabrics that are wholly formed and cut in the United States are eligible for duty-and quota-free entry under HTS heading 9802.00.90.

Canada. U.S. quotas on textiles and apparel imports from Mexico that do not meet the NAFTA rules of origin are scheduled to be eliminated by January 1, 2004. NAFTA provides for tariff preference levels (TPLs) that allow limited amounts of sector imports from Canada and Mexico that do not meet NAFTA rules of origin to enter at preferential duty rates under NAFTA.[15]

In 1999, two quotas (covering three quota categories) were in place on U.S. imports from Mexico that did not meet rules of origin requirements. One of these quotas, for men's and boys' wool suits, was more than 81 percent filled during 1999. In addition, 12 designated consultation levels were in effect on textile and apparel goods imported under 18 quota categories.[16] The designated consultation levels for imports of women's and girls' man-made fiber knit shirts and blouses; women's and girls' slacks and shorts; and men's and boys' wool suit-type coats and jackets were filled at levels between 82 percent and 100 percent during 1999.

Trade and Development Act of 2000

On May 18, 2000, President Clinton signed into law the Trade and Development Act of 2000, which provides for expanded trade benefits for 48 eligible countries in Sub-Saharan Africa (SSA) under title I, the African Growth and Opportunity Act (AGOA), and 24 CBERA beneficiary countries under title II, the United States-Caribbean Basin Trade Partnership Act (CBTPA). In part, the legislation authorizes preferential treatment for imports of certain textiles and apparel from SSA and CBERA countries. The legislation also changes the rules of origin for certain textile articles and temporarily suspends or reduces U.S. tariffs on imports of certain wool articles. The key textile and apparel provisions are summarized in appendix C.

Results of Previous Work

Over the last 20 years a considerable amount of research has been done on the effects of QRs on trade in textiles and apparel.[17] Clearly, simulations of gains from elimination of these QRs will yield varying results, depending upon

[15] TPLs (formerly TRQs, under the United States—Canada Free Trade Agreement)) were developed primarily to alleviate short supply problems, especially as they relate to manufacturers' inputs.

[16] The designated consultation levels (DCLs) are a more flexible import control than specific limits. The DCLs are usually set at levels that exceed existing trade levels and, once reached, cannot be exceeded unless the United States agrees to allow entry of additional shipments.

[17] Two important studies in the 1980s provided benchmarks for the magnitude of expected welfare gains from removal of these import restraints: Irene Trela and John Whalley, "Global Effects of Developed Country Trade Restrictions on Textiles and Apparel" *Economic Journal*, vol. 100, No. 403, December 1990, pp. 1190-1205;

the type of model used, the time period reviewed, and the scope of the analysis. The 1999 *Import Restraints* study surveyed a number of simulations done in the mid-1990s based on data from the early 1990s, and concluded that these studies produced estimates of economy-wide gains to the United States from quota elimination ranging from $7 to $11 billion.[18] For example, Harrison, Rutherford, and Tarr, using a global CGE model and 1992 data, estimated gains to the U.S. economy of $7.4 billion to $11.3 billion as a result of quota elimination by the United States, the EU, and Canada.[19] The 1999 *Import Restraints* study found that elimination of U.S. quotas on textiles and apparel in 1996 would mean welfare gains to the United States of $5.7 billion.[20]

Much less work has been done on the sectoral output and employment implications of removal of textile and apparel quotas. In their early study, De Melo and Tarr calculated that employment in textiles and apparel would drop by 157,000 work years if the U.S. quotas were removed in 1984.[21] Although far larger than the losses projected from quota removal in autos or in steel, this employment loss represented only 0.15 percent of the U.S. labor force. The

---

[17]—*Continued*
Jaime De Melo and David Tarr, "Welfare Costs of U.S. Quotas in Textiles, Steel and Autos," *Review of Economics and Statistics,* vol. 72, No. 3, August 1990, pp. 489-97. Trela and Whalley found that elimination of all Canadian, U.S. and European Union quotas on textiles and apparel in 1986 would mean an economy-wide welfare gain for the United States of $15 billion ($12 billion if both tariffs and quotas were removed). De Melo and Tarr, using 1984 data, calculated a welfare gain for the United States of $12 billion from elimination of U.S. textile and apparel quotas. One-half of this gain was attributed to capturing the rents that had been lost to exporting countries due to the use of VERs to restrain trade in these sectors, as opposed to import quotas.

[18] See, for example, Gary C. Hufbauer and Kimberly A. Elliott, *Measuring the Costs of Protection in the United States*, (Washington, DC: Institute for International Economics, 1994); USITC *Import Restraint: First Update*, Publication 2935, December 1995; Joseph F. Francois, Bradley McDonald, and Håkan Nordström, "Assessing the Uruguay Round," in W. Martin and L.A. Winters, eds., *The Uruguay Round and the Developing Economies*, World Bank Discussion Paper 307, (Washington, DC: The World Bank, 1995) pp. 117-214; and Yongzheng Yang, Will Martin, and Koji Yanagishima, "Evaluating the Benefits of Abolishing the MFA in the Uruguay Round Package," in Thomas W. Hertel, ed., *Global Trade Analysis: Modeling and Applications* (Cambridge: Cambridge University Press, 1997) pp. 253-279. For further discussions, see USITC *Import Restraints: Second Update*, Publication 3201, May 1999.

[19] Glen W. Harrison, Thomas F. Rutherford, and David G. Tarr, "Quantifying the Uruguay Round," in W. Martin and L.A. Winters, eds., *The Uruguay Round and the Developing Economies*, World Bank Discussion Paper 307 (Washington, DC: The World Bank, 1995), pp. 215-284.

[20] This is lower than previous estimates of $7.7 billion to $9.2 billion. See USITC *Import Restraints: First Update*, Publication 2935, December 1995.

[21] Jaime De Melo and David Tarr, "Welfare Costs of U.S. Quotas in Textiles, Steel and Autos," *Review of Economics and Statistics*, vol. 72, No. 3, August 1990, pp. 489-97.

1999 *Import Restraints* study reviewed several papers investigating income distribution effects, reemployment experience of textile and apparel workers, and wage changes. The evidence reported there suggested that income gains from quota elimination would be spread across all income groups, but disagreement remained as to whether the distribution of those gains would be skewed toward or away from lower income groups.[22] Textile and apparel workers were found to be somewhat less successful than workers in other industries in finding new jobs, so that the duration of unemployment was somewhat longer.[23] However, they were more likely to experience wage increases when reemployed, compared to workers from other manufacturing industries.[24]

To date, no study has explicitly measured the effects of the first two stages of the ATC on textile and apparel trade. However, the Textile Monitoring Body (TMB) of the WTO has issued two comprehensive reports evaluating the integration process. In its first report, the TMB stated that, with one exception, the products integrated by the importing developed countries in the first stage were not subject to quotas and consisted mainly of relatively lower value-added products, such as yarns and fabrics.[25] The TMB also stated that products integrated in the second stage consisted mainly of relatively lower value-added products.[26] In its second report, the TMB confirmed these conclusions, and emphasized that the large majority of products under restrictions will be

---

[22] Kenneth A. Hanson and Kenneth A. Reinert, "The Distributional Effects of U.S. Textiles and Apparel Protection," *International Economic Journal* vol. 11 No. 3, Autumn 1997, pp. 1-12; William R. Cline, *The Future of World Trade in Textiles and Apparel* (Washington, DC: Institute for International Economics, 1987); for a detailed discussion of these studies, see USITC *Import Restraints: Second Update*, Publication 3201, May 1999.

[23] Alfred J. Field and Edward M. Graham, "Is There a Special Case for Import Protection for the Textile and Apparel Sectors Based on Labour Adjustment?" *The World Economy* vol. 20 No. 2, March 1997, pp. 137-57. For a detailed discussion, see USITC *Import Restraints*: *Second Update,* Publication 3201, May 1999.

[24] Ibid.

[25] WTO, "Comprehensive Report of the Textiles Monitoring Body to the Council for Trade in Goods on the Implementation of the Agreement on Textiles and Clothing during the First Stage of the Integration Process," July 31, 1997, paragraph 15. Several other studies which offer qualitative assessments of the impact of the first stage of the ATC are: Laura Baughman, Rolf Mirus, Morris Morkre, and Dean Spinanger, "Of Tyre Cords, Ties and Tents: Window-Dressing in the ATC?" *World Economy* vol. 20 No. 4, July 1997 pp. 407-34; Dean Spinanger, "Textiles Beyond the MFA Phase-Out," *World Economy* vol. 22 No. 4, June 1999, pp. 455-76.

[26] Ibid., paragraphs 15 and 57. Note that the stage 2 integration programs were notified to the TMB during the period of the implementation of the stage 1 integration process. Thus, the first comprehensive report included an evaluation of these programs.

integrated between Jan. 1, 2002 and Jan. 1, 2005.[27] The second report also presents differing views of Members regarding the extent to which the increased growth in quotas has resulted in freer trade in textiles and apparel.[28] The TMB noted that any reliable assessment of this issue would require a detailed analysis, at the product level, taking into account such factors as the size of the original quota, the original quota growth rate (under the MFA), and the changes in demand for the respective products in the markets concerned.[29]

Restrictiveness of Import Restraints

Any attempt to quantify the restrictiveness of textile and apparel restraints must consider both U.S. import tariffs and the effects of using QRs in the form of "voluntary" export restraints (VERs).[30] VER is the term used in many economic studies to differentiate quantitative restraints that: 1) are applied on a discriminatory basis to some exporting countries, but not others; 2) are negotiated on a bilateral basis rather than imposed globally, and therefore, differ from country to country in terms of product coverage and degree of restrictiveness; and 3) involve limits on exports, implying the transfer of rents (generated by these restraints) from the importing country to the exporting

[27] WTO, "Comprehensive Report of the Textiles Monitoring Body to the Council for Trade in Goods on the Implementation of the Agreement on Textiles and Clothing during the Second Stage of the Integration Process," July 31, 2001, paragraphs 16, 46, 63, and 73. The first and second comprehensive reports by the TMB also discuss safeguard actions taken by importing countries under the ATC. Other recent qualitative assessments include: Kenneth Reinert, "Give Us Virtue, but Not Yet: Safeguard Actions Under the Agreement on Textiles and Clothing," *World Economy* vol. 23, No. 1, January 2000, pp. 25-55; Sung Jae Kim, Kenneth Reinert, and G. Chris Rodrigo, "The Agreement on Textiles and Clothing: Safeguard Actions from 1995 to 2000," unpublished manuscript, 2002.

[28] WTO, "Comprehensive Report of the Textiles Monitoring Body to the Council for Trade in Goods on the Implementation of the Agreement on Textiles and Clothing during the Second Stage of the Integration Process," July 31, 2001, paragraphs 277-281.

[29] Ibid., paragraph 329.

[30] The U.S., European, and Canadian VERs in textiles and apparel have long been a standard textbook example. See any of the following standard textbooks: Richard Caves, Jeffrey Frankel, and Ronald Jones, *World Trade and Payments* (New York: Harper Collins, 1996); Paul Krugman and Maurice Obstfeld, *International Economics* (New York: Addison-Wesley, 1997); James Markusen, James Melvin, William Kaempfer, and Keith Maskus, *International Trade* (New York: McGraw-Hill, 1995), Dominick Salvatore, *International Economics* (Upper Saddle River, New Jersey: Prentice-Hall, 1998). See also the seminal empirical study, Carl Hamilton, "An Assessment of Voluntary Restraints on Hong Kong Exports to Europe and the USA," *Economica* vol. 53, August 1986, pp. 339-350.

country.[31] As with other VERs, the quantitative restraints on textiles and apparel are not "voluntary," in that they are imposed by the United States pursuant to bilateral agreements with each exporting country.[32, 33]

If these restraints are binding, the prices of these products are expected to rise in the U.S. market.[34] Exporters who have licenses are able to capture rents by increasing the export prices of their products. Hence, these QRs result in an implicit tax on exports of textile and apparel products from restrained countries to the United States. Because these QRs are bilaterally negotiated, the implicit taxes they generate will vary across products and exporting countries. In addition, because these QRs are discriminatory, the ability of exporters to earn rent is moderated by unrestrained competing exporters.[35]

One way to measure the restrictiveness of this type of QR is to calculate its export tax equivalent (ETE): the rent as a percent of the price of the export product (exclusive of rent).[36] In this study, ETE estimates were calculated for individual textile and apparel exports to the U.S. market for each of the countries restricted by these quotas in 1999. These estimates provide some measure of the percentage increase in the prices of these goods *before* entry into the U.S. market. Estimation of ETEs for each exporting country requires a method for determining which product level quotas are binding constraints, and for estimating the quota rent. The methods used here follow those used in the 1999 study and are described below.

---

[31] Additional differences between VERs and other QRs, and their significance, will be discussed later in this section. For an in-depth examination, see Wendy Takacs, "The Non-Equivalence of Tariffs, Import Quotas, and Voluntary Export Restraints," *Journal of International Economics* vol. 8, 1978, pp. 565-73.

[32] It is well known that VERs are not voluntary. They are imposed at the request of the importing country, and the exporting country agrees to them to avoid the imposition of other types of trade barriers. See, for example, Paul Krugman and Maurice Obstfeld, *International Economics* (New York: Addison-Wesley, 1997), p. 203.

[33] While all U.S. trade barriers are *enforced* by U.S. customs, not all of them are *implemented* by the United States. For a detailed description of five exporting countries' textile and apparel license allocation systems, see Kala Krishna and Ling Hui Tan, *Rags and Riches* (Ann Arbor: University of Michigan Press, 1998).

[34] By definition, a constraint is binding if a small expansion of the constraint would yield a small increase in exports. See, for example, Alpha Chiang, *Fundamental Methods of Mathematical Economics* (NY: McGraw-Hill, 1984), pp. 370-71.

[35] The implications of the discriminatory nature of VERs are numerous and complex. See: Kala Krishna, "Trade Restrictions as Facilitating Practices," *Journal of International Economics*, vol. 26, 1989, pp. 251-270; Judith Dean and Shubhashis Gangopadhyay, "Market Equilibrium under the 'Threat' of a VER," *Journal of International Economics*, vol. 20, 1991, pp. 137-152.

[36] The increase in price the exporter is able to charge in the U.S. market as a result of a VER is referred to as rent. The ratio of rent to the exporters' price net of rent captures the percentage increase in price of the exported product (due to the VER) prior to its arrival in the U.S. market. Thus, it is similar to an export tax.

Methodology[37]

Many studies have defined a binding quota based on quota utilization, where utilization is measured by the ratio of actual imports to quota allotment.[38] However, utilization can be difficult to measure.[39] In addition, early work by Dean showed that textile and apparel quotas on eight small Asian exporting countries (over a 10-year period) were binding, despite relatively low utilization rates in a number of categories.[40] To reduce the possibility of omitting product categories that do face binding quotas, this study defined a quota as binding if either: the export license for that product category had a positive price, or the utilization rate exceeded 85 percent for a specific category limit or for a group limit. The first criterion is the best indicator, because a positive license price occurs if the specific or group quota is binding.[41] The second criterion is used (by necessity) because license price data are not available for most countries. Both these criteria were used in the previous *Import Restraints* studies, however, the choice of threshold for the second criterion differs. In the 1999 study, a threshold of 90 percent was used.[42] In the 1995 study, both an 80 percent and a 90 percent threshold were used, to test for sensitivity of results to choice of threshold. The choice of 85 percent as a threshold reflects the attempt to avoid omission of products with binding constraints in 1999, in the absence of a full sensitivity analysis.[43]

---

[37] A full discussion of estimation procedures is given in appendix E.

[38] See Refik Erzan, Junichi Goto, and Paula Holmes, "Effects of the Multi-Fibre Arrangement on Developing Countries' Trade: An Empirical Investigation," in Carl B. Hamilton, ed., *Textiles and Trade and the Developing Countries: Eliminating the Multi-Fibre Arrangement in the 1990s*, (Washington, DC: The World Bank, 1990), p. 68; and Rajiv Kumar and Sri Ram Khanna, "India, The Multi-Fibre Arrangement and the Uruguay Round," pp. 182-212, in the same volume.

[39] As the 1999 study noted, the bilateral agreements often allow for flexibility through 'swing,' 'carry-forward,' and 'carry-over' provisions, which make systematic analysis of quota utilization and quota restrictiveness difficult.

[40] Judith Dean, "The Impact of the MFA on Small Exporters," *Review of Economics and Statistics*, vol. 72 No. 1, February 1990, pp. 63-69. There are a number of explanations for this. For example, a product may be limited by both specific quotas and a group limit which encompasses several product categories. As a result, imports in a specific category may face a binding constraint due to a group limit even if utilization of that specific quota is low. Alternatively, if imports have a minimum size order, an exporting country's quota may be underutilized if there is insufficient quantity left to meet that minimum.

[41] An exporter is willing to pay a price for a license if he/she expects the constraint to be binding, because the license fee can then be recovered in the form of a higher consumer price.

[42] This is a commonly used threshold in the literature.

[43] Using the license price data for India, China, and Hong Kong, most products with positive license prices in 1999 had utilization rates exceeding 90 percent. However, some

As in the previous study, an ETE was calculated for *each* product category in which quotas were binding, for *each* exporting country.[44] In the cases of Hong Kong and China, the Commission calculated estimates of ETEs using average annual quota license prices as proxies for the respective rents.[45] For India, staff relied on estimates reported by Kathuria and Bhardwaj that were similarly calculated.[46] For all other exporting countries facing binding quotas, license price data for 1999 were not available.[47] In the absence of actual license price data, the standard approach in the literature has been to impute license prices for an exporting country, based on actual license price data from another country.[48] The approach used in the present study (and in the previous study) was developed by Yang.[49] In this approach, import data from an

---

[43]—*Continued*
categories with positive license prices would have been omitted had the threshold been 90 percent. None would have been omitted using an 85 percent threshold.

[44] In 1999, the following 15 countries were covered by quotas which were not considered binding, based on the second criterion stated in the text: Bahrain, Brazil, Colombia, Czech Republic, Egypt, Honduras, Hungary, Jamaica, Kenya, Kuwait, Laos, Russia, Slovakia, Ukraine, and Uruguay. An additional group of seven countries had a few quota fill rates of 85 percent or more, but they accounted for less than 1 percent of U.S. imports of those products: United Arab Emirates, Bulgaria, Fiji, Macedonia, Myanmar, Oman, Qatar. They were, therefore, considered too small to affect the export price to the United States.

[45] Chinese data are from www.chinaquota.com, retrieved on Oct. 1, 2001. Hong Kong data were provided by Alvaro Ferreira, International Business and Economic Research Corporation, Oct. 9, 2001.

[46] Sanjay Khaturia and Anjali Bhardwaj, "The Export Tax Equivalents of Quota Restrictions in the Indian Textile and Garment Industries," World Bank Working Paper, 2001.

[47] Bangladesh, Costa Rica, Dominican Republic, El Salvador, Guatemala, Indonesia, Macao, Malaysia, Mauritius, Nepal, Pakistan, Philippines, Poland, Romania, Singapore, South Korea, Sri Lanka, Taiwan, Thailand, and Turkey.

[48] In early studies, this involved adjusting the Hong Kong cost of a restrained product (where cost was defined as the f.o.b. price, net of rent) for differences in labor costs and labor productivity in each country relative to Hong Kong. (e.g., Irene Trela and John Whalley, "Global Effects of Developed Country Trade Restrictions on Textiles and Apparel," *Economic Journal,* vol. 100 No. 403, Dec. 1990, pp. 1190-1205.) However, Kala Krishna, Will Martin, and Ling Hui Tan showed that this method typically generated upward-biased results (K. Krishna, W. Martin, and L. Tan, "Imputing License Prices: Limitations of a Cost-Based Approach," *Journal of Development Economics,* vol. 52 No. 2, April 1997, pp. 355-74.

[49] Yongzheng Yang, "The Impact of MFA Phasing Out on World Clothing and Textile Markets," *The Journal of Development Studies*, vol. 20 No. 4, 1994, pp. 892-915. An alternative method, which is theoretically superior and eliminates the downward bias due to import-weighting, is to calculate the trade restrictiveness index, as done by James Anderson and J. Peter Neary, "The Trade Restrictiveness of the Multi-Fibre Arrangement," *World Bank Economic Review,* vol. 8, No. 2, May 1994, pp. 171-189. This was not feasible in the present study, due to data limitations.

unrestricted market (Japan) are used to construct proxies for the relative cost of products from these exporting countries. These cost ratios are then combined with Chinese cost data to derive estimated license prices for each product and exporting country.[50] For each apparel product, ETEs are calculated as the ratio of this estimated license price to estimated cost. Because complete 1999 textile license price data were only available for China, textile ETEs by product and exporting country were estimated using a simpler methodology, based on average ETEs for China, India, and Hong Kong as a group.[51]

Estimates of the average ETEs, import-weighted ad valorem tariffs, and quota rents for each textile and apparel product as defined by the USDOC, BEA input-output categories are presented in table 3-3. As in previous years, the estimated ETE for apparel is quite large, while those for textile imports are smaller and quite varied. The combined effect of both tariffs and quotas is a 34.4 percent increase in the price of apparel, and a 10 percent increase in the price of textiles.[52] Because the quotas are in the form of VERs, quota rent is transferred from the United States to the exporting countries. This annual net loss to the United States is estimated to be about $10 billion for apparel and about $674 million for textiles.[53]

A comparison between the results in table 3-3 and the 1996 ETEs reported in the previous study reveals significantly higher 1999 ETEs for four of the 12 product groups listed–apparel, home furnishings, broadwoven fabric mills, and carpets and rugs. ETEs for the other eight products show little change between 1996 and 1999. These differences most likely reflect the significant growth in import demand between 1996 and 1999, which outpaced the expansion in quota allotments across most products and countries.[54] Growth in U.S. imports of textiles and apparel slowed continually between 1994 and 1996, dropping

[50] The 1999 study used Hong Kong costs, based on the availability of license price data in 1996. The lack of availability of license price data is the reason all previous empirical studies in the literature use Hong Kong costs as a basis of comparison. By 1999, the number of Hong Kong's export products facing binding constraints had decreased, thus far fewer license prices were available. Since license price data for a much larger set of products were available from China, Chinese costs were used to construct the ETE estimates.

[51] Use of the Yang methodology requires license data for at least two other countries so that the accuracy of the relative cost estimates can be assessed. See appendix E for details.

[52] This textiles price increase is an import-weighted average of the values shown in table 3-3.

[53] Note that though the rent transfer is large, it is not likely to imply a net benefit to the exporting countries, as it is far outweighed by the lost revenues from reduced exports to the U.S. market. See, for example, Robert Feenstra, "How Costly is Protectionism," *Journal of Economic Perspectives* vol. 6, 1992, pp. 159-178.

[54] Some of the differences in *textile* ETEs may due to the change in methodology noted above.

Table 3-3
Import-weighted average tariffs, estimated ad valorem export tax equivalents and quota rents for textile and apparel by sectors, 1999

Sector	Average tariff rate[1]	Ad valorem export tax tquivalent	Quota rents[2]
	Percent		*Million dollars*
Textiles and apparel:			
Apparel	11.7	21.4	10,025
Broadwoven fabric mills	8.9	2.3	84
Narrow fabric mills	4.9	0.4	2
Yarn mills and thread mills	5.1	0.5	4
Carpets and rugs	3.5	1.4	18
Miscellaneous textile goods	2.2	0.1	1
Knitting mills and knit fabric mills	8.5	0.0	0
Home furnishings	6.4	7.3	223
Other fabricated textile products	3.1	1.5	40
Leather gloves[3]	12.7	0.0	0
Other restricted products:			
Luggage, handbags, purses, and other personal leather items	12.9	7.3	300
Man-made fibers	4.3	0.1	2

[1] Ad valorem equivalent.
[2] Earned by exporting country because the quota is in the form of a VER.
[3] Leather gloves are restricted by tariffs but not by QRs.

Source: USITC estimates.

from 9 percent in 1994 to 4 percent in 1996.[55] However, growth in imports increased five-fold to 20 percent in 1997, and remained in the double-digits through 1999.[56] Import growth in 1999 was 10 percent—two and a half times its rate in 1996. With most quotas on restrained products growing at less than 10 percent, this high import demand growth would drive up prices of restrained products in the U.S. market, leading to considerably higher ETEs relative to 1996.[57] With more than 50 percent of total U.S. apparel imports facing binding constraints, in contrast to about 25 percent of U.S. total textile imports,[58] it is not surprising that the increase in 1999 ETEs would be more significant on apparel than on textile products.

[55] Imports measured in quantity (USITC, *The Year in Trade*, Publication 2894, July 1995, Publication 2971, August 1996, Publication 3024, April 1997.)

[56] Imports measured in quantity (USITC, *The Year in Trade*, Publication 3103, May 1998, Publication 3192, May 1999, Publication 3336, August 2000).

[57] Khaturia and Bhardwaj note that Indian apparel ETEs have risen dramatically across virtually all products between 1996 and 1999. Chinese license prices for apparel have shown a similar trend.

[58] Staff calculations based on criteria described on pp. 22-23.

The average ETEs reported in table 3-3 are likely to be biased downward due to aggregation. As discussed earlier, import weights typically generate downward bias because more restrictive ETEs receive too little weight. In addition, the import weights used for the calculations were based on total U.S. imports, including unrestricted imports and imports facing non-binding quotas. Both of these types of imports were assigned an ETE of zero, thereby reducing the average ETE for each product. Finally, most BEA categories in table 3-3 included a larger number of products (HTS 10-digit level) than those falling under the ATC classification.[59] These additional products were assumed to have ETEs of zero, and thus reduced the average ETE estimate for the BEA product category.

At least three additional costs, caused explicitly by using QRs in the form of VERs, are not captured in the export tax equivalents shown in table 3-3. First, there are likely to be additional administrative costs to apparel retailers that are passed on to customers in the form of higher prices. Laura Baughman, President of The Trade Partnership,[60] noted in her presentation to the Commission that "retailers buy apparel from many more countries than they otherwise would in a quota-free world. Therefore, retailers need to have larger sourcing staff and sourcing budgets than they otherwise would in the absence of quotas."[61] Second, Faini, de Melo, and Takacs discuss a number of hidden costs from the MFA restrictions, including higher costs for U.S. imports overall, due to the shift in sourcing from restrained sellers to unrestrained sellers.[62] Since the first exporters to be restrained are typically the most efficient (lowest cost) producers, this shift raises the average cost of U.S. imports. Third, Krishna and Tan [63] present empirical evidence that the costs of the export license system within the restrained countries are significant and that both the license cost as well as these hidden administrative costs are added to the price of the product prior to entering the United States.[64] The existence of

---

[59] For example, 82 percent of the products (in value terms) included in "home furnishings" were included in the ATC classification.

[60] The Trade Partnership's members include the major U.S. retail trade associations.

[61] USITC Hearing Transcript, Dec. 4, 2001, p. 40.

[62] Ricardo Faini, Jaime de Melo, and Wendy Takacs, "A Primer on the MFA Maze," *World-Economy* vol. 18 No. 1, January 1995, 113-35.

[63] Kala Krishna and Ling Hui Tan, *Rags and Riches* (Ann Arbor: University of Michigan Press, 1998).

[64] It is possible that, in some cases, a portion of the rents generated by the quotas accrue to U.S. importers. This concept is known as rent-sharing. Krishna and Tan formally test for rent-sharing in U.S. textile and apparel trade with Hong Kong, South Korea, and Mexico. The authors find some evidence that rents are shared between exporters and importers. However, as in the 1999 study, lack of information on allocation of rents across many products and sellers, prevents the inclusion of rent-sharing in any reliable way in the present simulation. If rent-sharing were included, the ETEs would be higher than those reported in table 3-3.

these additional costs implies that the estimates of the ETEs in table 3-3 represent only a portion of the tax-equivalent effect of the quotas.[65]

Aggregation of the ETEs for apparel into a single number tends to mask the size and significance of the individual ETEs. To see these effects more clearly, table 3-4 shows additional information on restrictions on apparel imports by fiber. Having identified, for each exporting country, the apparel products facing binding constraints,[66] the values of these imports were summed across products and across exporting countries, to yield the total values of restricted U.S. apparel imports by fiber.[67] These values are expressed as a percentage of total U.S. apparel imports by fiber, in the first column of table 3-4. The number of exporting countries with at least one product (in that fiber group) bound by a restraint is shown in the second column. Cotton and man-made fiber apparel imports, together, made up about 80 percent of total U.S. apparel imports in 1999. Table 3-4 indicates that more than 47 percent of U.S. cotton apparel imports faced binding restrictions, affecting 21 exporting countries. More than 60 percent of U.S. man-made fiber apparel imports faced binding restrictions, affecting 18 exporting countries. While 74 percent of apparel imports of silk blends and other vegetable fibers were restricted, this fiber group accounted for only about 3 percent of total U.S. apparel imports in 1999, and affected far fewer exporting countries.

The last two columns of table 3-4 report the share of restricted apparel imports from China, India, and Hong Kong (as a group) and a weighted average apparel ETE for this group of exporters, by fiber. These three suppliers represent between 33 percent and 88 percent of the value of restricted U.S. apparel imports, across fiber groups. The import-weighted average ETEs for these three suppliers show apparel imports of cotton, wool, and man-made fibers facing higher ETEs than the average figure for all apparel reported in table 3-3, while apparel of silk blends and other vegetable fibers face an ETE well below the average.

Model Specification

Chapter 1 describes the USITC general equilibrium model and its application to model the removal of import restraints. In the case of textiles and apparel, the model's database was modified to highlight the effects on the sectors that are directly affected by textile and apparel quotas and tariffs, as well as upstream suppliers to these industries and downstream industries using

[65] Part of the price increase from a VER may also be due to quality upgrading. This is very difficult to measure, since textile and apparel VERs are defined at highly disaggregated levels. See Bee Aw and Mark Roberts, "Measuring Quality Change in Quota-Constrained Import Markets: The Case of U.S. Footwear," *Journal of International Economics,* vol. 21, August 1986, pp. 45-60.

[66] See discussion on pages 22-23.

[67] Apparel groups by fiber designated by the USDOC (*www.otexa.ita.gov*).

Table 3-4
Restrictions on apparel imports, 1999

	Restricted imports (percent of total imports)	No. of countries facing binding constraints	Percent of total restricted imports from China, India and Hong Kong	Average ad valorem export tax equivalent for apparel from China, India, Hong Kong (percent)
Cotton	47.6	21	35.4	30.0
Wool	36.0	14	60.4	26.7
Man-made fibers	60.6	18	33.2	24.0
Silk and other veg. fibers	74.1	11	88.2	7.7

Note.—Apparel groupings by fiber follow those designated by the USDOC (*www.otexa.ita.gov*). Cotton apparel: MFA categories 237-239, 330-359; Wool apparel: MFA categories 431- 459; Man-made apparel: MFA categories, 630-659; Silk and other vegetable fibers: MFA categories 831-859.

Source: USITC calculations, using data from *www.chinaquota.com*, retrieved Oct. 1, 2001, from Alvaro Ferreira International Business and Economic Research Corporation (Hong Kong), and from Sanjay Khaturia and Anjali Bhardwaj, "The Export Tax equivalents of Quota Restrictions in the Indian Textile and Garment Industries," World Bank Working Paper, 2001.

their products. The set of textile and apparel sectors itself contains a number of sectors that use and supply goods to each other. This analysis will examine two cases: removing U.S. QRs on the imports of textiles and apparel, and removing both the QRs and tariffs.

As noted previously, under the ATC, the United States, EU, and Canada will end their QRs for WTO member countries by 2005. The scenarios analyzed in this section consider the impact of eliminating only U.S. restraints, but include the impact of elimination of restraints on non-WTO members as well as WTO members. The trade barriers eliminated under both scenarios are those that were in effect in 1999, before the implementation of the Trade and Development Act of 2000.

Effects of Liberalization

Eliminating the textile and apparel quotas (case 1) would result in an overall economywide gain of about $12.3 billion in 1999. This is a significantly larger welfare gain than predicted in the 1999 study, and is consistent with the larger ETE estimates for apparel and for some textile sectors.[68] Eliminating both textile and apparel quotas and tariffs (case 2) would result in an overall economywide gain of about $13 billion. It is not surprising that the largest U.S. gains are from quota elimination. Though the tariffs in table 3-3 are high, the ETEs for apparel, home furnishings, and

[68] See pp. 24-25 for further discussion.

luggage, handbags and other leather personal items are quite high. Because the QRs are in the form of VERs, a very large rent is transferred to the exporting countries in apparel and in several textile sectors. Removal of these QRs transfers this rent to the United States, in addition to the conventional efficiency gains which occur with tariff or import quota removal.[69]

The sector-specific effects of quota and tariff removal are influenced by the level of the ETEs, and the estimates of various behavioral parameters, in particular, the substitution elasticities between imports and domestically produced goods.[70] In addition, the output of some textile sectors falls into more than one sector. For example, broadwoven fabrics fall under both broadwoven fabric mills and home furnishings. Some of the output of textile sectors is also used as inputs in apparel. The impact on these textile sectors' overall real price, output and employment are determined, in part, by: the level of ETEs for their primary products and any downstream products; the indirect effects from expansion or contraction of sectors which purchase these products.

Case 1: Removal of Textile and Apparel Quotas

As table 3-5 indicates, the largest reductions in real price resulting from removal of the textile and apparel quotas, occur in the sectors with the largest initial ETEs: (1) apparel (-11 percent); (2) luggage and handbags (-5 percent); (3) home furnishings (-2 percent). The consumption gains from removal of the quotas depend upon both real price reduction and the degree to which domestic consumption[71] expands, as a result of the drop in real price of a product.[72] Because these three sectors also appear to have the largest increases in domestic consumption, they are likely to be the source of the largest total consumption gains.

Two of these three sectors show a significant contraction in output and FTE employment as a result of the drop in prices. Apparel contracts by 12 percent, as does luggage and handbags. Home furnishing shows only a 1 percent decline. Exports also contract in each of these sectors, by a similar magnitude to the drop in output.[73] Imports expand by 17 percent for apparel, 8 percent for luggage and handbags, and 7 percent for home furnishings. Several other sectors are also expected to contract, despite very small ETEs and

[69] Therefore, VERs are seen as much more costly trade barriers than either tariffs or import quotas. See the references given earlier in the chapter.

[70] See appendix D.

[71] Domestic consumption is equal to domestic production less exports plus imports.

[72] Consumption gains will also depend upon income effects, e.g., the recapture of VER rents from the exporting countries.

[73] This result is expected. Essentially demand for the U.S. good is falling hence overall output contracts. With negligible (or adverse) terms of trade changes and very low elasticities of transformation in production, exports fall roughly in proportion with output.

Table 3-5
Case 1: Sector-specific economic effects of textile and apparel quota elimination, changes in FTEs, value and percent, 1999

Sector	Employment		Output		Imports		Exports		Composite price[3]
	FTE[1]	Percent	Value[2]	Percent	Value[2]	Percent	Value[2]	Percent	Percent
Liberalized Sectors:									
Textile and apparel sectors:									
Apparel, includes only apparel made from purchased materials	-48,970	-12.0	-6,589	-12.0	7,734	16.5	-843	-11.8	-11.2
Broadwoven fabric mills	-19,000	-5.9	-1,468	-5.9	-112	-3.1	-140	-5.5	-0.4
Carpets and rugs	-140	-0.3	-35	-0.3	42	3.2	-2	-0.3	([5])
Home furnishings, including curtains and draperies	-250	-0.6	-62	-0.7	206	6.8	-4	-1.0	-1.8
Knitting mills and knit fabric mills	-10,470	-13.1	-636	-13.2	-67	-6.9	-70	-13.0	1.3
Miscellaneous textile goods	-300	-0.3	-48	-0.4	-2	-0.2	-8	-0.4	0.2
Narrow fabric mills	-1,140	-6.1	-103	-6.2	-34	-6.9	-46	-6.0	-0.6
Yarn and thread mills	-6,560	-5.8	-738	-5.9	-39	-5.2	-34	-5.5	-0.1
Other fabricated textile products	-2,870	-3.1	-88	-3.2	12	-0.5	-48	-3.0	-0.7
Other product covered by quotas:									
Luggage, handbags, purses, and other personal leather items	-1,840	-12.1	-225	-12.1	330	8.1	-36	-10.9	-5.0
Leather gloves	10	0.5	1	0.4	([4])	0.2	([4])	-0.5	0.3
Manmade fibers	-2,930	-2.8	-354	-2.8	-51	-3.2	-59	-3.3	0.2

See footnotes at end of table.

Rest of economy:									
Agriculture forestry, and fisheries	-1,210	-0.1	-192	-0.1	6	([5])	-44	-0.2	0.2
Construction	2,360	([5])	-4	([5])	([4])	([4])	([4])	([5])	0.3
Durable manufacturing	3,010	([5])	-274	([5])	687	0.1	-138	([5])	0.3
Finance, insurance, real estate	7,560	0.1	1,702	0.1	23	0.1	4	([5])	0.3
Mining	90	([5])	-34	([5])	43	0.1	-3	-0.1	0.3
Nondurable manufacturing	2,250	([5])	72	([5])	116	0.1	-81	-0.1	0.3
Services, other	40,430	0.1	1,554	([5])	41	0.1	36	([5])	0.3
Transportation, communications, and utilities	4,700	([5])	-35	([5])	96	0.1	-32	([5])	0.3
Wholesale and retail trade	12,640	0.1	220	([5])	0	0	-24	([5])	0.3

[1] Full-time equivalents.

[2] In millions of dollars in base year prices.

[3] Price of the composite good (i.e., imports and domestic production).

[4] Change less than $500,000 in absolute value or nontraded sector.

[5] Change less than 0.05 percent in absolute value.

Source: USITC estimates.

very small changes in real price as a result of quota removal. One such example is broadwoven fabric mills. Although price in that sector falls by only 0.4 percent, simulated results suggest a 6 percent drop in output and in FTE employment. This is most likely due to the fact that broadwoven fabrics are upstream products for apparel, home furnishings, and other textile sectors whose output is shrinking.[74]

The largest expansions in output as a result of removal of textile and apparel quotas are found in finance, insurance and real estate, followed by services, and wholesale and retail trade. The largest expansions in FTE employment occurs in these same sectors, as well as in durable manufacturing. However, the overall effects on the rest of the economy even in these sectors are quite small. This is not surprising, since the employment displaced in the textile and apparel industries is a relatively small percentage of the U.S. labor force.

Case 2: Removal of Textile and Apparel Tariffs and Quotas

With the removal of both textile and apparel quotas and tariffs (table 3-6), real prices fall in all textile and apparel sectors. Again, significant real price reductions are found in apparel (-17 percent), luggage and handbags (-13 percent) and home furnishings (-4 percent). As shown in table 3-3, these three sectors had both high ETEs and high tariffs. However, most textile sectors had very high tariffs even if ETEs were low. Hence, a number of additional sectors show significant reductions in real price: leather gloves, narrow fabric mills, other fabricated textile products, and broadwoven fabric mills.

Output and FTE employment now contract by 26 percent in knit fabric mills, 30 percent in luggage and handbags, and 17 percent in apparel. Broadwoven fabric mills, yarn and thread mills, and narrow fabric mills show contractions of 10 percent or more in output and FTE employment. Imports rise in all but three sectors. In those sectors – narrow fabric mills, yarn and thread mills, and manmade fibers – the decline in imports as well as in domestic output suggests a drop in demand for these products, regardless of source, due to a decline in the downstream industries, such as apparel.

The expansions in output and employment in the rest of the economy are slightly larger than those in Case 1, and more widespread. Output expansion is largest in durable and nondurable manufacturing and services. Increases in FTE employment occur in most of the other sectors of the economy – most notably durable manufacturing, services and wholesale and retail trade – though these expansions are still small in percentage terms. Again this is not surprising, because the employment displaced in the textile and apparel industries is a relatively small percentage of the U.S. labor force.

[74] The large decline in output and employment in knitting mills and knit fabric mills probably reflects the fact that this an integrated sector. It produces both knit fabrics and apparel made from its own knit fabrics.

Table 3-6
Case 2: Sector-specific economic effects of textile and apparel quota and tariff elimination, changes in FTEs, value and percent, 1999

Sector	Employment		Output		Imports		Exports		Composite price[3]
	FTE[1]	*Percent*	*Value[2]*	*Percent*	*Value[2]*	*Percent*	*Value[2]*	*Percent*	*Percent*
Liberalized Sectors:									
Textile and apparel sectors:									
Apparel, includes only apparel made from purchased materials	-70,320	-17.2	-9,478	-17.2	12,401	26.5	-1,225	-17.1	-17.2
Broadwoven fabric mills	-33,180	-10.2	-2,571	-10.3	123	3.4	-242	-9.5	-2.2
Carpets and rugs	-490	-0.9	-116	-1.0	134	10.3	-5	-0.7	-0.6
Home furnishings, including curtains and draperies	-350	-0.9	-89	-1.0	378	12.4	-4	-1.0	-4.0
Knitting mills and knit fabric mills	-20,920	-26.2	-1,272	-26.3	56	5.8	-135	-25.1	-1.0
Miscellaneous textile goods	-870	-0.9	-137	-1.0	38	2.8	-18	-1.0	-0.2
Narrow fabric mills	-1,820	-9.8	-165	-9.9	-39	-7.8	-74	-9.5	-3.1
Yarn and thread mills	-11,840	-10.5	-1,333	-10.6	-28	-3.7	-61	-9.8	-0.7
Other fabricated textile products	-6,020	-6.5	-185	-6.6	69	2.6	-93	-5.7	-2.5
Other product covered by quotas:									
Luggage, handbags, purses, and other personal leather items	-4,550	-29.8	-557	-29.9	903	22.1	-87	-26.3	-13.4
Leather gloves	-80	-5.6	-8	-5.7	17	9.9	(4)	-4.2	-6.5
Manmade fibers	-5,850	-5.5	-707	-5.5	-41	-2.5	-113	-6.4	-0.2

See footnotes at end of table.

Table 3-6—*Continued*
Case 2: Sector-specific economic effects of textile and apparel quota and tariff elimination, changes in FTEs, value and percent, 1999

Sector	Employment		Output		Input		Exports		Composite price[3]
	FTE[1]	*Percent*	*Value*[2]	*Percent*	*Value*[2]	*Percent*	*Value*[2]	*Percent*	*Percent*
Rest of economy:									
Agriculture forestry, and fisheries	-360	([5])	-121	([5])	-93	-0.4	72	0.3	0.3
Construction	5,580	0.1	7	([5])	0	0.0	([4])	0.1	0.4
Durable manufacturing	34,960	0.3	6,421	0.2	-2,037	-0.3	1,509	0.4	0.4
Finance, insurance, real estate	11,370	0.2	1,367	0.1	-37	-0.2	54	0.2	0.4
Mining	1,320	0.3	297	0.2	-102	-0.2	13	0.3	0.4
Nondurable manufacturing	10,010	0.2	1,085	0.1	-560	-0.3	143	0.1	0.4
Services, other	65,510	0.1	1,383	([5])	-87	-0.2	140	0.1	0.4
Transportation, communications, and utilities	10,870	0.2	662	0.1	-329	-0.3	214	0.3	0.3
Wholesale and retail trade	27,970	0.1	373	([5])	0	0	165	0.2	0.4

[1] Full-time equivalents.
[2] In millions of dollars in base year prices.
[3] Price of the composite good (i.e., imports and domestic production).
[4] Change less than $500,000 in absolute value or nontraded sector.
[5] Change less than 0.05 percent in absolute value.

Source: USITC estimates.

CHAPTER 4
Agriculture

This chapter focuses on food and agricultural imports to assess the impact of U.S. TRQs and border measures under section 201 in effect during the study's base year, 1999.[1] Under TRQs, this chapter examines dairy products, sugar and sugar-containing products (SCPs), peanuts, cotton, tobacco and tobacco products, ethyl alcohol, canned tuna, beef, and olives.[2] Under section 201 border measures, this chapter examines wheat gluten and lamb meat.[3]

Tariff-Rate Quotas

U.S. TRQ policies for the food and agricultural commodities share a number of characteristics: market prices that are influenced by price guarantees and production or marketing quotas, and border measures to restrict imports. Domestic producer prices of various commodities are supported at certain rates by offering loans to producers or processors, with the commodity serving as collateral for these loans. In particular, the Farm Service Agency of the U.S. Department of Agriculture (USDA) administers marketing loans for wheat, rice, corn, grain sorghum, barley, oats, upland cotton and oilseeds through the Commodity Credit Corporation (CCC). Marketing loans are designed to prevent costly buildup of publicly owned stocks while allowing prices to vary in response to market conditions. Alternatively, eligible producers may choose to receive loan deficiency payments when market prices are lower than commodity loan rates. Producers or processors are allowed to forfeit their

[1] Under section 201 of the Trade Act of 1974, the USITC assesses whether U.S. industries are being seriously injured by significant increases in imports and can recommend to the President that relief be provided to those industries to help them adjust to import competition. Relief could take the form of increased tariffs or quotas on imports and/or adjustment assistance for the domestic industry.

[2] The cigarette sector was identified as a high-tariff sector (see Chapter 6). However, because of strong linkages between cigarettes and the tobacco sector, the cigarette sector liberalization is included with the tobacco and tobacco products analysis.

[3] Section 201 measures subsequently removed, but which were in force in 1999, are included.

commodity to the CCC instead of repaying their loans. This is likely to happen when domestic market prices fall below a certain level—the loan rate plus certain costs that producers/processors would no longer incur if they forfeited. The CCC offers nonrecourse loans for extra-long-staple cotton, tobacco, peanuts, and sugar. The CCC also buys at support prices butter, cheddar cheese, and nonfat dry milk. Border measures restrict low-cost imports and maintain domestic market prices at sufficiently high levels to prevent producers/processors from forfeiting on their commodity loans.

These support programs, created by Congress in the early 1930s to assist farmers, have evolved over time. Most recently, the 1994 Uruguay Round Agreement on Agriculture (URAA) of the General Agreement on Tariffs and Trade (GATT) and the 1996 Federal Agriculture Improvement and Reform (FAIR) Act have been important in shaping current agricultural policies.

The URAA initiated significant steps toward freer trade for agriculture. Nontariff measures (NTMs) were converted into scheduled import tariffs. When this so-called tariffication of NTMs was implemented, a system of TRQs also was established to ensure that quantities imported before the URAA took effect could continue to be imported. Tariff-rate quotas are two-tier tariffs that allow a fraction of domestic consumption requirements to be met by imports that are subject to a lower, in-quota tariff. Imports above the quota level or "trigger quantity" are charged a much higher, over-quota tariff. Tariffication has, in principle, resulted in more transparent agreements in market access. The extent of market access liberalization resulting from TRQ implementation is ambiguous, however, with many TRQs remaining under-filled (i.e., imports are less than the quota). Deficient import demand may cause underutilization of TRQs, but the administration of TRQs may be affecting the level of imports, as well.[4]

The FAIR Act revised federal farm policy in several important ways. Title I of the FAIR Act, the Agricultural Market Transition Act (AMTA), replaced production-based deficiency payments for wheat, feed grains, upland cotton, and rice with fixed production flexibility contract payments. Farmer payments depend on the initial acreage under cultivation and these payments gradually decline to zero for the period 1996-2002. In addition, AMTA maintained price guarantees of the marketing assistance loan program for contract commodities, oil crops, and extra-long staple cotton. The AMTA also continued the market price support programs for sugar and peanuts that operate through CCC loans and import TRQs. Since 1998, world prices for grain and many staple farm products have declined significantly, however. To support producer prices, the U.S. Federal Government has made emergency payments to agriculture. The FAIR Act also scheduled the elimination of the dairy price support program, but the Congress has since reinstated it.

[4] For a discussion of TRQ administration, see David W. Skully, *Economics of Tariff-Rate Quota Administration*, USDA, Economic Research Service, Technical Bulletin No. 1893, April 2001.

The Agreement on Agriculture imposed constraints on governments by limiting spending on "amber box" policies.[5] Amber box policies include commodity-specific marketing loans, nonrecourse loans, direct government payments to producers, other commodity-specific transfers, and noncommodity-specific measures of support received by producers, such as input subsidies. Amber box policies are the most likely to cause producers to divert resources into supported commodities, thus affecting supplies, trade, and world prices. Because of their trade-distorting effects, amber box policies are subject to careful review and to further gradual spending caps under the Agreement on Agriculture. Support levels from amber box policies are quantified by calculation of an aggregate measure of support, which combines support levels for all commodities. U.S. emergency payments since 1998 fall under amber box limitations, but the United States has not exceeded its limits.

Model Specification

This analysis is based on simulations performed with appropriately specified data of the USITC's CGE framework. Appendix table D-1 lists 71 sectors that specify sectoral coverage in the CGE model. Of the 71 sectors in the aggregation, 14 sectors are directly affected by the border measures under examination in this chapter: five dairy manufacturing sectors (creamery butter; cheeses; dry, condensed, and evaporated dairy products; ice cream and frozen desserts; and fluid milk); sugar manufacturing and five sugar-containing products (SCPs) sectors (food preparations, not elsewhere classified; coffee; chocolate and cocoa products; wet corn milling; and candy and other confectionary products); cotton farming; and two tobacco products sectors (tobacco stemming and redrying and cigarettes).

To account for significant upstream and downstream linkages between the 14 directly affected sectors and other sectors in the economy, the model aggregation includes several sectors in agriculture, food processing, and textile manufacturing that are indirectly affected by removal of import restraints.[6] For example, removal of the U.S. sugar TRQ would result in increased U.S. imports and reduced U.S. prices for sugar. Meanwhile, U.S. sugar crop farming

[5] A traffic light analogy was used by Uruguay Round negotiators to categorize domestic agricultural policies. "Red box" policies were to be stopped; "yellow" or "amber box" policies indicated caution, and were subject to limitations; "green box" policies could continue and were exempt from limitations; "blue box" policies are payment programs that limit production and meet specific criteria.

[6] A recent econometric study shows that maintaining a narrow, commodity focus for competitive analysis may result in erroneous or misleading conclusions. See Darren Hudson and Don Ethridge, "Competitiveness of Agricultural Commodities in the United States: Expanding Our View," *American Journal of Agricultural Economics*, vol. 82, No. 5, pp. 1219-1223, November 2000. The authors highlight the importance of considering downstream industries using the integrated cotton fiber, textiles, and apparel industry as an example.

—the upstream sector in this case—would face a reduced demand for its output and would contract in size, with productive resources, such as labor, transferred to other sectors in the U.S. economy. U.S. beverages—a downstream sector—would benefit from reduced U.S. sugar prices because beverage prices would decline and demand for beverages would increase. With sugar relatively cheaper in the United States, intermediate and final demand for sugar would increase and demand for other sweeteners would fall (e.g., high fructose corn syrup, which is a component of the wet corn milling sector). Given these potential effects, identification of sugar crops farming (upstream), wet corn milling (competing product), and beverages (downstream) in the CGE framework allows for a more satisfactory modeling of economic adjustments and a better assessment of border policies. The rest of the economy is aggregated into several sectors (i.e., other manufacturing; transportation, communication, utilities; wholesale and retail trade; finance insurance and real estate; and other services).

The peanuts and canned tuna TRQs and the lamb meat quota are analyzed with partial equilibrium frameworks because these industries are not identified in the published U.S. input-output statistics that form the basis of the USITC CGE framework. The analytical framework used to simulate the impact of import barriers for those products is the Commercial Policy Analysis System or COMPAS, a partial equilibrium trade model, which has been developed by the USITC (see appendix D for a complete discussion of COMPAS). As discussed in the beef and olives sections, no simulations have been performed for the beef and olives TRQs.

Modeling Food and Agricultural Border Measures

Import tariffs are usually modeled as constant, ad valorem wedges between world and domestic market prices. In models, a reduction in an import tariff leads to an increase in imports and a decline in the domestic market price. In a TRQ system, however, the wedge between world and domestic prices is a function of three policy instruments: the in-quota tariff, the over-quota tariff, and the quota level. A change in only one of these policy instruments might lead to a change in domestic market prices and imports. Thus, modeling of TRQ reform requires explicit modeling of all three policy instruments.[7] This

[7] For discussion of these issues see Devry S. Boughner, Harry de Gorter, and Ian M. Sheldon, "The Economics of Two-Tier Tariff-Rate Import Quotas in Agriculture," *Agricultural and Resource Economics Review*, vol. 29, No. 1, April 2000, pp. 58-69; David W. Skully, "Liberalizing Tariff-Rate Quotas," *Agricultural Policy Reform in the WTO-The Road Ahead*, edited by Mary E. Burfisher, ERS, USDA, Agricultural Economic Report No. 802, May 2001; A. Elbehri, M. Ingco, T. Hertel and K. Pearson, "Agriculture and WTO 2000: Quantitative Assessment of Multilateral Liberalization of Agricultural Policies," paper presented at The Conference on Agriculture and the New Trade Agenda in the WTO 2000 Negotiations, Oct. 1-2, 1999, Geneva, Switzerland; and Marinos Tsigas and Merlinda Ingco, "Market Access Liberalization for Food and Agricultural Products: A General Equilibrium Assessment of Tariff-Rate Quotas," USITC Office of Economics Working Paper No. 2001-10-A, October 2001.

report, however, focuses on analyzing the consequences of completely removing the TRQs.[8] Hence, it is not necessary to model explicitly all three TRQ policy instruments in the CGE model, but it is important to introduce into the model the price impacts of the TRQs in 1999 by means of price gaps.[9] Those price gaps inevitably reflect world product prices that are distorted by domestic (producer subsidies) and border economic policies (export subsidies) and other trade restrictions imposed by many governments around the world. The results reported here should be interpreted as impacts of U.S. import restraints given trade policies by all foreign governments.

The TRQ system for U.S. dairy products is highly complex. As a result, precise estimation of price wedges is difficult. In all, 23 different TRQs cover dairy products included in the five input-output sectors. USDA collects both domestic and world price data for butter, and those price series serve as a basis for the estimate of the ad valorem tariff equivalent for butter. For dry-milk products, cheese, and fluid milk and cream, the ad valorem tariff equivalents are trade-weighted tariffs (i.e., total customs revenue divided by customs value, in percentage terms). For ice cream, the ad valorem tariff equivalent is based on the actual ad valorem tariff on ice cream.[10]

Ad valorem tariff equivalents for cotton and peanuts were calculated by using the price-gap method. Ad valorem tariff equivalents for sugar and SCPs were calculated by using the price-gap method and actual tariffs.[11] The tariff equivalent for tobacco was calculated by using the actual in-quota tariff.[12]

The rents generated by TRQs can affect the welfare changes associated with TRQ liberalization. The analysis here is based on the assumption that foreign exporters capture all of the quota rents and that the duties collected from U.S. tariffs are equal to those observed in 1999 trade statistics. Appendix D discusses in detail the derivation of the price gaps in the CGE model.

---

[8] At the hearing before the Commission, the National Milk Producers Federation testified that contrary to the simulations performed in this report, U.S. Government trade policy "seeks multilateral or regionally phased reductions, rather than unilateral elimination of measures that restrict trade." See testimony of Peter Vitaliano, National Milk Producers Federation, transcript of hearing, Dec. 4, 2001, Washington D.C., p. 144. The purpose of this report, however, is not to propose any trade policy action; rather, its purpose is to provide balanced information for the trade policy community.

[9] A price gap for a commodity is defined for this analysis as the difference between the domestic and world prices for that commodity. The methodology for developing estimates of these price gaps is documented in appendix D.

[10] Federal milk marketing orders, which set prices for fluid milk in the United States, were not explicitly modeled.

[11] The sugar-containing sectors in the CGE model include products/establishments that are not covered by the TRQs. Thus, the ad valorem tariff equivalents applied to the SCPs sectors reflect the trade weight of sugar-containing imports relative to all imports for each sector.

[12] The Commission makes appropriate adjustments to estimated price wedges to reflect the fact that the definitions of the specific products under the TRQs may be much finer than the input-output categories used in the model. For a complete documentation of the methodology see appendix D.

In the USITC CGE model, simulations are constructed as if both TRQs and domestic support policies for the same products were removed and should be interpreted in that context. Most U.S. agricultural commodities that are covered by TRQs are supported by government programs that prevent domestic prices from falling below certain levels. Government price support programs vary between commodities, and include government commodity purchases, nonrecourse loans, marketing orders, and production quotas. The specific methods of price support are discussed later in this chapter. If the domestic support programs remained in place and unchanged, the U.S. Government would be required to acquire massive stocks of these commodities through the CCC to prevent domestic price declines in the face of rising imports. This result would be prohibitively expensive and may also be in violation of U.S. commitments under the internal support provisions of the URAA.[13]

Each of the following sections provides a brief overview of each sector, the trade barriers in that sector, an evaluation of the level of import restraints in 1999, an examination of previous analysis of these restraints, and an assessment of the impacts of border measures.

Dairy Products

Import restraints are applied to several milk products, including fluid milk and cream, butter, cheese, powdered milk products, ice cream, infant formula, and animal feeds containing milk. Table 4-1 presents the value of shipments, level of employment, and trade for certain dairy products during 1997-99. U.S. shipments averaged $65 billion per year during 1997-99, with fluid milk and cream accounting for about 38 percent of such shipments; cheese for 35 percent; dry/concentrated milk products, 14 percent; ice cream, 10 percent; and butter, 3 percent.

U.S. trade in dairy products is relatively small in comparison to the domestic market. In 1999, for example, the total value of dairy imports was $1,325 million, representing about 2 percent of the total value of dairy shipments, while dairy exports, valued at $887 million, represented about 1 percent of such shipments. More than 95 percent of dairy imports consisted of cheese, casein/caseinates, and milk protein concentrates (MPC) in 1999, while major dairy exports were cheese and whey.[14]

[13] The National Milk Producers Federation testified that real-life food and agricultural markets are more complicated than their model representations. The analytical exercises performed in this report, though, provide policy impacts of qualitative value that can be useful in policy evaluation. See testimony of Peter Vitaliano, National Milk Producers Federation, before the USITC, transcript of hearing, Dec. 4, 2001, Washington, D.C.

[14] Casein, caseinates, and MPC have not been produced in the United States since the early 1950s. After USDA established a price-support program for milk, U.S. butter and powder producers realized greater returns from drying their skim milk into nonfat dry milk and selling it to the government intervention agency, the CCC, than from processing it into casein and MPC. Therefore, domestic supplies of casein have since been furnished from imports.

Table 4-1
Dairy: Summary data, 1997-99

Item	1997	1998	1999
Shipments *(million dollars)*:			
Butter	1,370	1,950	1,600
Cheese	20,330	23,790	24,530
Dry/condensed milk products	9,190	8,810	9,880
Fluid milk and cream	22,220	26,360	25,390
Ice cream	5,900	6,180	6,530
Employment *(FTEs)*:			
Butter	1,800	1,800	1,800
Cheese	37,000	37,500	38,000
Dry/condensed milk products	16,000	15,800	15,700
Fluid milk and cream	58,200	57,500	56,500
Ice cream	20,000	19,700	19,500
Imports *(million dollars):*			
Butter	19.3	61.4	32.9
Cheese	541.0	629.6	715.1
Dry/condensed milk products	476.1	595.8	541.7
Fluid milk and cream	8.5	13.3	17.0
Ice cream	0.2	0.3	18.0
Exports *(million dollars)*:			
Butter	25.9	14.2	4.5
Cheese	123.6	117.0	130.1
Dry/condensed milk products	637.0	644.5	651.6
Fluid milk and cream	34.3	26.6	16.3
Ice cream	83.3	82.2	84.7

Source: Shipments and employment: USITC estimates based on USDOC, Bureau of Census, *2000 Census of Manufacturers*; Milk Industry Foundation, *Milk Facts: 2000 Edition*, Washington, DC, November 2000; National Cheese Institute, *Cheese Facts*: *2000 Edition,* Washington, DC, August 2000; and International Ice Cream Association, *The Latest Scoop: 2000 Edition*, Washington, DC, Sept. 2000. Imports and exports: USDA, FAS, *Dairy, Livestock, and Poultry: U.S. Trade and Prospects*, March 2000.

Nature of Trade Barriers[15]

In the United States, milk is marketed under a complex system of federal, state, and local laws and regulations. Programs at the Federal level include domestic price supports,[16] milk marketing orders,[17] import controls, export subsidies and supports, as well as domestic and international food aid programs.[18] These programs are used to influence the use and availability of milk in the domestic market in order to affect the level and volatility of producer prices and incomes. A consequence of government intervention has been to raise U.S. domestic prices substantially above world market prices.[19] Owing to the incentives created by the price gap between domestic and world markets, border controls have been necessary to prevent imports from lowering domestic dairy prices, and undermining government support programs.

Since 1995, TRQs have been used to control imports of dairy products that previously had been subject to absolute quotas.[20] TRQs are applied to several dairy products, including fluid milk and cream (fresh, condensed, and

[15] Much of this discussion draws from Jonathan R. Coleman and Devry S. Boughner, "Tariff Rate Quotas in the U.S. Dairy Industry," *Bringing Agriculture into the GATT: Issues in Reforming Tariff-Rate Import Quotas in the Agreement on Agriculture in the WTO*, International Agricultural Trade Research Consortium, Commissioned Paper No. 13, University of Minnesota, 2000.

[16] Under the system, market prices for butter, cheddar cheese, and nonfat dried milk are supported through purchases of domestic surpluses by the CCC. The CCC is a government-owned and operated corporation within USDA. Under the FAIR Act, dairy supports were to have been eliminated by 1999 and replaced by a recourse loan for dairy processors. However, in the face of lower prices, USDA appropriation measures extended the program through 2001. Proposed legislation by the House of Representatives would extend the program through 2011.

[17] Federal milk marketing orders regulate handlers that sell milk or milk products within an order region, by requiring them to pay not less than an established minimum price for the Grade A milk they purchase from dairy producers, depending on how the milk is used. This classified pricing system requires handlers to pay a higher price for milk used for fluid consumption (Class I) than for milk used in manufactured dairy products such as yogurt, ice cream, cheese, butter and nonfat dry milk (Class II, Class III and Class III-A products).

[18] For a detailed discussion of U.S. dairy policy, K.W. Bailey, *Marketing and Pricing of Milk and Dairy Products in the United States* (Ames, IA: Iowa State University Press, 1997); D.P. Blayney, J.J. Miller, and R.P. Stillman, *Dairy: Background for 1995 Farm Legislation*, USDA, Economic Research Service, Agricultural Economic Report No. 705, April 1995, 11-21; and D.A. Sumner and T. Cox, "FAIR Dairy Policy," *Contemporary Economic Policy*, vol. XVI, 1998, pp. 58-68.

[19] For example, between 1997 and 1999, the average U.S. price of butter was 82 percent higher than the world price, while U.S. cheese prices were 44 percent higher and nonfat dry milk prices were 57 percent higher.

[20] The TRQs, introduced in 1995 under the URAA, replaced the existing dairy quotas that had been imposed under section 22 of the Agricultural Adjustment Act of 1933. The section 22 quotas had originally been designed to limit imports of dairy products to a quantity equivalent to approximately 2 percent of the U.S. production of milk.

evaporated), butter, cheese, milk powders, whey products, chocolate containing butterfat, infant formula, ice cream, and animal feeds containing milk. Imports subject to TRQs – mainly cheese – amounted to $564 million annually during 1997-99, while the ratios of imports to domestic consumption for all major categories were 5 percent or less.

Over half the value of the dairy products imported into the United States between 1997 and 1999 were not subject to TRQs, including certain varieties of cheese (mainly cheese made of sheep's milk), milk protein concentrates, and whey protein concentrates.[21] These products faced fairly low specific and/or ad valorem tariffs. For example, the average ad valorem equivalent across all nonquota imports was 1 percent during 1997-99, with cheese at 4 percent, and whey protein concentrate at 5 percent. Casein, accounting for almost 30 percent of all dairy imports, is imported duty free. In general, dairy imports not subject to TRQs represent more than 95 percent of domestic consumption, indicating that U.S. production of these products is negligible or nonexistent.

Most U.S. dairy product imports are subject to price-based special safeguards (SSGs).[22] The additional duties applied under the SSG provisions increase as the value of imports declines.[23] This import value is determined by the U.S. Customs Service, and defined as the price actually paid or payable for merchandise, excluding U.S. import duties, freight, insurance, and other charges. Price-based SSGs are applied automatically and do not have to be formally announced when in effect, as in the case of volume-based SSGs.

---

[21] Dairy trade volumes may also be estimated in terms of milk equivalents, which provides a common denominator for aggregating different types of dairy products. According to a statement provided by Peter Vitaliano of the National Milk Producers Federation to the USITC, total tariff-only items represented about one-half of total U.S. dairy imports in 1999.

[22] Under Article 5 of the URAA, countries may apply SSGs to products whose nontariff measures have been converted into duties, and that are designated for SSG treatment in their schedules. Special safeguards take the form of temporary additional duties and are typically applied to products particularly sensitive to trade. The Agreement on Agriculture permits SSGs to prevent low prices or import surges from injuring a domestic industry, although no determination of injury is required). There are two types of SSGs—price-based and volume-based. Price-based SSGs allow additional duties to be imposed on imported products when prices fall below a fixed trigger price (based on average prices during 1986-88), and are imposed on a shipment-by-shipment basis. Volume-based SSGs allow additional duties to be imposed if actual imports exceed a certain trigger level of imports, based on average consumption and import levels over the previous 3 years. In either case, SSGs are applied on a tariff line basis and may be applied only to over-quota tariff rates. SSGs are published in chapter 9904 of the Harmonized Tariff Schedule of the United States.

[23] For example, U.S. SSG provisions for cheddar cheese require that with an import value of less than 29.5 cents per pound, an SSG of 57.2 cents per pound is added to the over-quota tariff of 57.3 cents per pound. Thus, the overall tariff is 114.5 cents per pound. As the value increases, the SSG declines and reaches zero when the value reaches 83.9 cents per pound. Note that the SSG allows the overall value of imports (import value plus over-quota tariff and SSGs) to remain in a fairly small range (134.5 cents per pound to 142.5 cents per pound).

In addition to tariff measures, importers argue that there are significant nontariff barriers to trade in dairy products. For example, several industry representatives indicate that TRQ administration—the method by which in-quota TRQ quantities are allocated among importers—is costly and cumbersome, and serves as a significant barrier to entry for firms wishing to operate in the United States. About three-quarters of the dairy products subject to TRQs require a license to be imported into the United States. The licensing authority is the USDA's Foreign Agricultural Service (FAS), which allocates licenses annually to importing firms that conduct business in the United States and have an office and an agent in the United States. However, because firms are not required to be of U.S. origin, foreign firms are also eligible to apply for licenses.[24]

For certain products with TRQs, importers must obtain an import licence issued by the USDA to receive the in-quota rate. A typical license will identify the product, the country from which the product may be imported, and the maximum quantity that may be imported. Many licenses are country specific. However, an "other country" license allows the importer to source the product up to a certain quantity from any country other than those under country-specific TRQs.[25] An "any country" license allows an importer to source imports up to a certain quantity of a particular product from any country in the world, including those with country-specific licenses. There are also two types of licenses—historical and nonhistorical. Historical licenses are renewable annually and are valid for the same product from the same country. A license will be renewed as long as the importer has met the requirements of the regulation. Nonhistorical licenses are not renewable. Importers may reapply for an identical nonhistorical license for the next year, but the licenses are issued through a lottery-type system.[26] Certain dairy products for which there are TRQs may be imported without a license under a first-come, first-served system administered by the U.S. Customs Service.[27] No licenses are required to import at the much higher over-quota duty rates.

[24] The New Zealand Dairy Board exports large amounts of dairy products to the United States under the TRQ regime, but also imports products because the Board has purchased subsidiary companies that own import licenses in the United States.

[25] For example, in 1999 the TRQ for butter was 6,377 tons (HTS chapter 4, Additional U.S. Note 6). Country-specific licenses were issued to importers sourcing 151 tons of product from New Zealand and 96 tons of production from the EU. Other country licenses for countries other than New Zealand or the EU totaled 74 tons. Any country licenses accounted for the remaining tonnage (6,056 tons), and could be sourced from all eligible countries, including New Zealand and the EU.

[26] There are also designated licenses for cheese imports issued to importers who have met the regulation's qualification standards and have been designated by the government of the exporting country to receive a license. Not all countries participate in the designation process.

[27] These products may be brought in at the in-quota rate until a specified TRQ is filled, and once the TRQ is filled, importers must pay the over-quota rate. The items covered under the first-come, first-served system include: dairy products from Mexico;

In addition to licensing, U.S. imports of dairy products are also subject to various health and sanitary regulations. For example, U.S. imports of fluid milk products are prohibited unless accompanied by a valid permit issued by the U.S. Secretary of Health and Human Services under the provisions of the Import Milk Act of 1927.[28]

Restrictiveness of Trade Barriers

Overall, the TRQ system has been highly effective in making over-quota imports uncompetitive in the U.S. market. For example, in 1999, the U.S. price of butter ($1.23 per pound) was significantly higher than the price of imports at the in-quota tariff ($0.71 per pound), but lower than the price of imports at the over-quota tariff ($1.37 per pound). Similarly, for cheddar cheese and nonfat dry milk (NDM), the over-quota tariff was sufficient to deter imports above the TRQ level. Evidence of the restrictiveness of barriers is provided by TRQ fill rates during the 1997-99 period, as detailed in table 4-2.

Table 4-2
Dairy products: Tariff-rate quota percentage fill rates, 1997-99

Product	1997	1998	1999	Average
		Percent		
Butter	97	99	98	98
Butter substitutes	100	98	99	99
Nonfat dry milk	87	96	98	94
Wholemilk powder	100	97	98	98
Dried buttermilk/whey	43	39	39	40
Cheese	79	86	95	87
Fluid milk	53	98	97	82
Evaporated & condensed milk	51	76	67	65
Infant formula	3	100	100	68
Ice cream	1	1	69	23

Source: USDA, FAS, "Dairy Monthly Imports," various issues.

TRQs for the major internationally traded dairy products—butter, NDM, wholemilk powder, and cheese – were almost completely filled. The TRQs for butter substitutes and fluid milk also appear to be restrictive, as indicated by a ratio of imports to TRQs of nearly 100 percent.[29] This conclusion is supported

[27]—*Continued*
certain dairy products from Israel; cheddar cheese from Canada (made from unpasteurized milk and aged nine months or more); fluid milk or cream (fresh or sour); milk or cream (condensed or evaporated and in airtight containers); dried buttermilk or whey; infant formula; ice cream; and animal feed containing milk.

[28] 44 Stat. 1101.

[29] Over-quota imports for 1999 were the following: butter, 606 tons; butter substitutes, 2,203 tons; nonfat dry milk, 256 tons; and whole milk powder, 252 tons.

by major world exporters of dairy products who argue that the U.S. import restraints are binding, and also by the fact that major U.S. producer and processor groups have not expressed concern over excessive imports.[30]

In a few product categories, such as dried buttermilk and whey, the rates fluctuated and/or were lower, indicating that TRQs were not constraining for imports that are unable to compete with domestically produced goods.[31] The quotas also do not appear to be binding for condensed and evaporated milk (65 percent fill), and ice cream (23 percent fill). However, because the licensing system involves allocation of country-specific quantitative limits, it is difficult to gauge the extent to which quotas are binding. For example, in 1999, the TRQ quantity on condensed and evaporated milk and cream in airtight containers was 6,057 tons, compared with actual imports of only 4,071 tons. Thus, only two-thirds of the total TRQ was filled, suggesting the quota was not a binding constraint. However, the Netherlands completely filled its allocation of 488 tons, while other country-specific quotas were not filled.[32] Some importers argue that low fill rates are evidence that the licensing system is a significant nontariff barrier to trade. Most quotas are not completely filled even though U.S. prices are significantly above international prices.[33]

TRQ administration may have led to imports falling short of TRQ quantities. Reasons for this include the assignment of country specific licenses to countries that may not produce or export the product, or are high-cost producers, as in the case of the ice cream TRQ allocated to Jamaica; the allocation of TRQs in insufficient volume to make transporting economically viable, such as 100 tons of infant formulas and 100 tons of cream powder; the difficulty in forming long-term business relationships among importers, exporters, and end-users for products administered by "first-come, first-served" systems; the reallocation methods for country-specific quotas, which are

[30] New Zealand Dairy Board, written submission to the USITC, for Investigation No. 332-325, June 10, 1998, and industry representatives, telephone interviews with USITC staff, July 1998.

[31] For example, the fluid milk quota of 11.4 million liters was not filled. This is largely because imports for most countries (except Canada and Mexico) cannot be transported to the United States at a sufficiently low cost to make them competitive. Milk market regulation in Canada also makes the U.S. market unattractive to Canadian producers.

[32] For example, Denmark used none of its 5,604-ton allocation.

[33] A low quota fill rate does not necessarily mean that the TRQ is acting as a nontariff barrier to trade. For instance, if there is insufficient domestic demand for the product at prevailing world market prices, imports may not reach the TRQ quantity level. In 1995, the in-quota price of butter (i.e., the world price plus the in-quota tariff) exceeded the U.S. price by several cents per pound, limiting imports and resulting in a TRQ fill rate of only 6 percent. During 1997-99, the U.S. price exceeded the in-quota price, and, consequently, the fill rates were much higher in those years. Low quota fill rates might be the result of other border issues, such as sanitary and phytosanitary regulations. However, U.S. dairy imports do not appear to be reduced because of these requirements, since many suppliers can meet the U.S. standards.

complicated; and the failure of importing firms to surrender unused amounts to be used for reallocation.[34]

Previous Work

In 1999, the Commission estimated, based on 1996 data, that removal of the dairy TRQs would cause imports of dry/condensed milk products, butter, and cheese to increase by 12.4, 13.1, and 13.7 percent, respectively.[35] As a result of increased imports, real prices of these commodities would decline by 0.1 to 1.0 percent, and domestic supply of dairy products would decline by 0.05 to 0.1 percent. The estimated overall effect of liberalizing the dairy TRQs amounted to a welfare gain of $152 million a year.

In a study published in 1999, Zhu, Cox, and Chavas assessed the impacts of full free trade in the world dairy sectors.[36] The authors included analyses of import, export, and domestic policies. They found that relative to 1989-94 world dairy market conditions, full free trade would cause the world average prices to decline by 7.9 percent for cheese, 8.5 percent for butter, 2.9 percent for whole milk powder, and 6.5 percent for skim milk powder. The world average price of milk would decline by 7.1 percent, but the world price of casein, a dairy product subjected to few trade restrictions, would increase by 14.3 percent. Current dairy policies allow productive resources to be attracted to casein production. But under free trade, a more efficient resource allocation would be established, and resources would leave casein production and enter other dairy industries. The authors found that the U.S. price of butter would increase by 29.9 percent, while prices would decline by 1.5 percent for cheese, 3.6 percent for whole milk powder, and 14.4 percent for skim milk powder. The authors estimated the United States would gain $180 million annually in economic welfare.

In a recent study, Shaw and Love used a partial equilibrium model of global dairy markets to examine the effects of increased market access for these products.[37] In their model, the authors doubled dairy product quotas and

---

[34] For additional reasoning, see Boughner, D.S. and H. de Gorter, "The Economics of 2-tier Tariff-Rate Import Quotas: The Agreement on Agriculture in the WTO and U.S. Dairy Policy," paper presented at the International Agricultural Trade Research Consortium Annual Meeting, St. Petersburg, FL, Dec. 13-15, 1998 (revised April 1999).

[35] USITC, *The Economic Effects of Significant U.S. Import Restraints, Second Update 1999*, May 1999.

[36] Yong Zhu, Thomas L. Cox and Jean-Paul Chavas, "An Economic Analysis of the Effects of the Uruguay Round Agreement and Full trade Liberalization on the World Dairy Sector," *Canadian Journal of Agricultural Economics*, vol. 47, No. 5, December 1999, pp. 187-200.

[37] Ian Shaw and Graham Love, *Impacts of Liberalizing World Trade in Dairy Products*, Australian Bureau of Agricultural and Resource Economics, Research Report 01.4, Canberra, Australia, May 2001.

cut in half the tariff rates. They found that relative to 1999, the value of the global cheese trade increased by 39 percent, butter trade increased by 37 percent, and milk powder trade increased by 14 to 25 percent. The main markets to increase imports were the European Union, the United States, and Japan. The European Union and the United States also increased their exports. The gross value of U.S. production fell by 1.2 percent for milk and by 1.4 percent for dairy products.

The Effects of Liberalization

The CGE model base case estimates show that liberalizing the dairy TRQs and eliminating domestic price supports in 1999 results in an economic welfare gain of $109 million to the U.S. economy.[38] Declining dairy product prices contribute to an economic welfare gain under liberalized trade.[39] The base case estimates show that the largest real price declines are about 1.7 percent for butter and 1.0 percent for cheese. Real prices decline by 0.1 percent for dry or condensed dairy products and ice cream. Table 4-3, part A presents the base case model estimates of employment, output, trade, and price effects of unrestricted imports in the U.S. dairy market.

The upstream dairy farm sector declines by less than 1 percent in output and employment, which translates to declines of $60.8 million in output and a loss of 240 FTE jobs. Employment and output are estimated to decline in all the dairy manufacturing sectors, with the butter sector experiencing the largest proportional decline of about 1.7 percent. In all liberalized dairy markets, imports increase and exports decline. The model estimates show that the cheese sector experiences the largest absolute trade change: U.S. cheese imports increase by about $142 million, a 22 percent rise.

In the base case, output and employment in the rest of agriculture also decline. Sectors such as feed grains are negatively affected by the contraction in dairy farming. With the exception of wholesale and retail trade, the rest of the U.S. economy expands as resources leave dairy manufacturing and dairy farming for other sectors in which the United States has a comparative advantage. The model estimates that overall U.S. employment grows by about 400 FTE jobs due to removing the U.S. dairy TRQs.

[38] The introduction to this chapter discusses linkages between trade and domestic agriculture policies and the interpretation of the simulation results presented in this section.

[39] The change in the composite price of a dairy product is an appropriately weighted average of the changes in the real prices of domestic and imported varieties of the same product. In this simulation, the decline in the price of imports is bigger than the decline in the domestic price and it is largely driven by the trade policy being removed. See the "CGE Data" section, appendix D, for a discussion of how dairy policies were quantified.

Table 4-3
Dairy: Selected economic effects of TRQ removal, 1999

Sector	Employment		Output		Imports		Exports		Composite price[3]
	FTE[1]	*Percent*	*Value[2]*	*Percent*	*Value[2]*	*Percent*	*Value[2]*	*Percent*	*Percent*
A. Base case scenario and base parameters; economywide welfare gain of $109 million due to the elimination of import restraints.									
Liberalized sectors:									
Butter	-30	-1.7	-17.6	-1.7	17.0	54.1	-0.04	-1.0	-1.7
Cheese	-240	-0.6	-134.6	-0.6	142.4	22.2	-0.6	-0.5	-1.0
Dry/condensed milk products	-30	-0.2	-15.4	-0.2	14.6	2.5	-1.1	-0.2	-0.1
Ice cream and frozen desserts	-50	-0.2	-13.8	-0.2	11.9	30.2	-0.2	-0.2	-0.1
Fluid milk	0	(5)	-0.66	(5)	1.9	7.1	-0.02	(5)	(5)
Upstream sector:									
Dairy farms	-240	-0.3	-60.8	-0.3	-0.2	-0.3	-0.1	-0.2	(5)
Rest of economy:									
Agriculture	-10	(5)	-19.1	(5)	-1.1	(5)	0.9	(5)	(5)
Forestry, Fisheries	10	(5)	1.2	(5)	-0.4	(5)	0.3	(5)	(5)
Construction	20	(5)	-0.2	(5)	(4)	(4)	(4)	(4)	(5)
Processed foods	40	(5)	12.4	(5)	-2.4	(5)	0.8	(5)	(5)
Durable manufacturing	400	(5)	94.9	(5)	-40.9	(5)	23.6	(5)	(5)
Nondurable manufacturing	50	(5)	-2.8	(5)	-11.2	(5)	2.4	(5)	(5)
Finance, insurance, and real estate	20	(5)	7.1	(5)	-0.9	(5)	0.9	(5)	(5)
Mining	10	(5)	4.7	(5)	-2.7	(5)	0.2	(5)	(5)
Other services	490	(5)	27.7	(5)	-2.4	(5)	3.2	(5)	(5)
Transportation, communications, and utilities	50	(5)	7.8	(5)	-7.1	(5)	3.9	(5)	(5)
Wholesale and retail	-100	(5)	-12.4	(5)	(4)	(4)	(4)	(4)	(5)

Table 4-3—*Continued*
Dairy: Selected economic effects of TRQ removal, 1999

Sector	Employment		Output		Imports		Exports		Composite price[3]
	FTE[1]	Percent	Value[2]	Percent	Value[2]	Percent	Value[2]	Percent	Percent
B. Alternative Scenario 1 - base case substitution elasticity; import supply elasticity of 50; economywide welfare gain of $128 million due to the elimination of import restraints.									
Liberalized sectors:									
Butter	-30	-1.7	-17.6	-1.7	17.0	54.1	-0.04	-1.0	-1.7
Cheese	-260	-0.7	-149.8	-0.7	160.4	25.0	-0.7	-0.5	-1.1
Dry/condensed milk products	-30	-0.2	-15.4	-0.2	14.6	2.5	-1.1	-0.2	-0.1
Ice cream	-50	-0.2	-13.8	-0.2	11.9	30.2	-0.2	-0.2	-0.1
Fluid milk	0	(5)	-0.66	(5)	1.9	7.1	-0.02	(5)	(5)
Upstream sector:									
Dairy farms	-260	-0.3	-66.6	-0.3	-0.2	-0.3	-0.1	-0.3	(5)
Rest of economy	1,010	(5)	123.1	(5)	-68.9	(5)	38.4	(5)	(5)
C. Alternative Scenario 2 - substitution elasticity of 5; import supply elasticities of 50; economywide welfare gain of $219 million due to the elimination of import restraints.									
Liberalized sectors:									
Butter	-470	-26.8	-273.7	-26.8	17.2	563.8	-0.7	-15.2	-3.6
Cheese	-2,690	-7.2	-1,533.8	-7.2	1,091.0	169.9	-8.0	-6.1	-1.6
Dry/condensed milk products	-20	-0.1	-8.9	-0.1	33.6	5.6	-4.5	-0.7	-0.1
Ice cream	-190	-0.8	-47.7	-0.8	42.0	106.8	-0.6	-0.7	-0.1
Fluid milk	-100	-0.1	-32.2	-0.1	9.6	36.7	-0.2	-0.5	(5)
Upstream sector:									
Dairy farms	-2,610	-2.9	-666.7	-2.9	-1.8	-2.8	-1.4	-2.7	(5)
Rest of economy	7,240	(5)	1,068.4	(5)	-847.3	-0.1	448.1	(5)	(5)

[1] Full-time equivalents.
[2] In millions of dollars in base year prices.
[3] Real price of the composite good (i.e., imports and domestic production).
[4] Not applicable or nontraded sector.
[5] Less than 0.05 percent in absolute value.

Note.—Base case scenario Armington elasticities for every sector in the model are specified in appendix D, table D-1; all price wedges and methodology are specified for each restraint on pp. D-16 and D-17, table D-2.

Source: USITC estimates.

In the CGE model, the response of dairy product imports to relative price changes is determined by substitution elasticities between domestic and imported varieties of the same dairy product as well as by import supply elasticities.[40] It is possible that the estimated import supply elasticity for these products is biased. For example, because import supply elasticities were estimated using data from a market distorted by country-specific quotas, the estimated parameters could be biased downward. If dairy products were supplied freely from the entire world market, a larger import supply elasticity could be expected.[41] In the base case, the import supply elasticity for cheese is 7.143. For the alternative scenarios, 50 is used, the same value applied in the other dairy sectors. This alternative import supply elasticity is equivalent to assuming an essentially flat import supply curve. The results of this scenario can be found in table 4-3, part B.

The overall impacts of trade liberalization are similar to the base case results. As expected, with a larger import supply elasticity for cheese, U.S. cheese imports increase by more without affecting the world price of cheese as much as in the base case. Thus, the composite price of cheese declines by more relative to the base case.[42]

The parameter estimates relied upon for the base case simulation suggest that the imported dairy varieties are not close substitutes for the domestic varieties. However, one might expect that imported butter is indeed a close substitute for domestic butter. Because the estimates of the substitution elasticities were empirically estimated using trade and price data within a market distorted by a complex quota system, it is possible that the estimates have been biased downward. To consider the possibility that certain products are much better substitutes than in the base case, the Commission performs an alternative simulation of liberalization of dairy products with an assumed substitution elasticity of 5. The results appear in table 4-3, part C.[43] As

[40] For a complete list of substitution elasticities used in the model, see appendix table D-1. For recent estimates of Armington elasticities and a discussion of the issues, see Michael P. Gallaway, Christine A. McDaniel, and Sandra A. Rivera, "Industry-level estimates of U.S. Armington elasticities," USITC, Office of Economics Working Paper No. 2000-09-A, September 2000, found at Internet address *ftp://ftp.usitc.gov/pub/reports/studies/ec200009a.pdf*, retrieved Dec. 31, 2001.

[41] Recent studies have made different assumptions about the nature of the import supply elasticities. For a discussion on this phenomenon, see "The Effects of Liberalization" section for sugar, later in this chapter.

[42] In the base case, import supply elasticities for other dairy products are 50, except for cheese. In table 4-3, parts B and C the import supply elasticity is 50 for all products. For estimates of import supply elasticities, see Kenneth A. Reinert and David W. Roland-Holst, "Parameter Estimates for U.S. Trade-Policy Analysis," April 1991.

[43] In the base case, the elasticities of substitution between domestic and imported dairy products are between 1.0 and 1.9 (appendix table D-1). In table 4-3, part C, all dairy product substitution elasticities are increased to 5, an *assumed* value that is about twice as large as that used in several recent trade analyses. See K. Huff, H. Hanslow, T. Hertel, and M. Tsigas, "GTAP Behavioral Parameters" in T.W. Hertel, editor, *Global Trade Analysis: Modeling and Applications* (NY: Cambridge University Press, 1997).

expected, if imported dairy products are assumed to be close substitutes to domestic products, trade liberalization leads to considerably larger increases in imports and larger declines in domestic production. In this example, the U.S. butter producing sector declines by about 27 percent.

The results in table 4-3 suggest that the net benefits of trade liberalization increase when imports are closer substitutes for domestic products. For example, the economic welfare gain increases from $109 million (base case simulation) to $219 million (alternative scenario 2). In comparing different results, those scenarios under which dairy trade are most sensitive to the elimination of import restraints are also the very same scenarios under which the economy as a whole would most benefit from such elimination.[44]

Sugar and Sugar Containing Products

The sugar sector consists of three 4-digit SIC categories: raw cane sugar (2061), refined cane sugar (2062), and refined beet sugar (2063).[45] Sugar is used as an input in the manufacture of a multitude of food items. Thus, the sugar-containing product sector spans several 4-digit SIC categories.[46] In the current study, the sugar sector will serve as the primary focus, with a secondary discussion on the SCP sector that is covered by the applicable import restraints, because of the quantity of sugar contained within the products.

Sugar is a large part of the U.S. consumer's diet. According to the USDA, Economic Research Service (ERS), the United States is the third largest consumer of sugar in the world behind the EU and Brazil.[47] In 1999, sugar comprised approximately 43 percent of the total U.S. consumption of sweeteners.[48] Of the sugar consumed in the United States, approximately 80 percent is produced domestically. U.S. sugar production remains an important contributor to U.S. agricultural GDP and employment. In 1999, sugar

[44] The Commission also examined the sensitivity of results to the assumption that U.S. dairy exports are imperfect substitutes with domestically consumed dairy products (see the "Trade Equilibrium" section, appendix D). Without this assumption, the implications of trade liberalization are similar to those presented in table 4-3, part A. The composite price declines by about 1.7 percent for butter and 1.0 percent for cheese. Output declines by 1.7 percent for butter and 0.6 percent for cheese. Imports increase by 54 percent for butter and 30 percent for ice cream. Economic welfare improves by $106 million. U.S. butter exports, however, increase by 3.9 percent. This result is intuitively appealing: trade liberalization causes U.S. dairy product prices to decline; thus, U.S. dairy exports become more competitive in world markets.

[45] Sugarcane and sugar beet production (SIC category 0133) are not formally included in the sugar sector, as the import restraint is applied to the manufactured product.

[46] SIC categories for SCPs include candy and other confectionery products (2064), chocolate and cocoa products (2066), chewing gum (2067), bread and other bakery products (2051), cookies and crackers (2052), and frozen bakery products (2053).

[47] USDA, ERS, *Sugar and Sweetener Situation and Outlook Report*, January 2001.

[48] USDA, FAS, *Sweetener Market Data Yearbook*, fiscal year 1999.

production approached $6 billion, consisting of $1.7 billion from raw cane sugar production, $2 billion from cane-sugar refining, and $2.2 billion from refined beet sugar production (table 4-4). In that same year, estimated combined employment in the three sectors totaled 17,289 full-time equivalent jobs.[49]

The United States is one of the largest producers of sugar. In 1999, the United States held a 5.8-percent share and was the fifth largest producer, trailing only Brazil, the EU, India, and China. U.S. production levels of sugar (on a refined basis) increased by 4 percent during 1997-99, from 8.26 million metric tons to 8.6 million metric tons.[50] The United States is a net importer of sugar and exports very little sugar onto the world market.[51] U.S. sugar producers have no incentive to export sugar at low world market prices, as domestic U.S. prices are nearly 2.5 times the world price, because of U.S. sugar policies.

The United States imports mostly raw cane sugar to maintain cane refining capacity utilization. In 1999, imports of raw sugar totaled $173 million, while imports of refined sugar totaled only $11 million (table 4-4). The total value of imports of raw and refined sugar fell significantly, by 65 percent, between 1997 and 1999. Declining world prices and the tightening of the TRQ for sugar were the major contributing factors to the decline in the value of U.S. imports. World prices fell by 46 percent for raw sugar and by 36 percent for refined sugar during 1997-99, while the combined TRQ allocations for raw and refined sugar fell by 44 percent during the same period.[52] During 1997-99, the import penetration ratio for the volume of sugar, fell from 28.4 percent to 18.2 percent.[53]

Nature of Trade Barriers

U.S. sugar trade barriers are derived from both domestic and trade policies. Under certain market conditions, the trade policy (i.e., the administration of the TRQ) has the potential to offset the intended effects of the domestic policy (i.e., a guaranteed floor price for U.S. producers).

---

[49] Estimated employment in the upstream sectors, the growing of sugarcane and sugar beets (SIC 0133), was 44,015 workers in 1999 (table 4-4).

[50] USDA, ERS, *Sugar and Sweetener Situation and Outlook Report*, January 2000.

[51] Almost all exports of U.S. sugar fall under the refined sugar re-export program that allows cane sugar refiners and manufacturers using refined sugar as an input to import raw cane sugar at or slightly above world prices. However, the equivalent quantity of imported sugar is re-exported within a given time period. The refined sugar re-export program is designed to ensure the competitiveness of U.S. sugarcane product exports on the world market while offering U.S. cane sugar refiners access to the raw material to maintain capacity utilization of their refineries.

[52] USITC, *Industry & Trade Summary: Sugar*, publication 3405, March 2001.

[53] The import penetration ratio is the ratio of imports to U.S. consumption. USITC, *Industry & Trade Summary: Sugar*, publication 3405, March 2001.

Table 4-4
Sugar: Summary data, 1997-99[1]

Item	1997	1998	1999
Production *(million dollars)*:			
Raw cane sugar[2]	1,404	1,604	1,744
Cane sugar refining [3]	1,673	1,742	1,995
Refined beet sugar [3]	2,105	2,105	2,234
Employment *(FTEs)*:			
Raw cane sugar [4]	5,334	5,123	4,921
Cane sugar refining [4]	4,051	4,007	3,964
Refined beet sugar [4]	8,464	8,434	8,404
Sugarcane production[5]	20,608	20,163	19,728
Sugar beet production[5]	25,064	24,672	24,287
Imports *(million dollars)*:			
Raw cane sugar[6]	526	368	173
Refined sugar[7]	7	14	11
Exports *(million dollars)*[8]	61	44	45

[1] Values are reported for fiscal years beginning Oct. 1 of the previous year and ending Sept. 31 of the reported year.

[2] Valued at the U.S. domestic price for raw sugar.

[3] Valued at the U.S. domestic wholesale price for refined beet sugar.

[4] The three subsectors of the sugar sector correspond to 4-digit SIC categories: raw cane sugar (SIC 2061), cane sugar refining (SIC 2062), beet sugar (SIC 2063). Employment numbers were estimated by USITC staff based on employment figures reported by LMC International. Employment numbers include only direct employment by the industry and are reported full-time equivalent employees.

[5] Sugarcane and sugar beet production (SIC 0133) are not formally included in the sugar sector, as the import restraint is applied to the manufactured product.

[6] Valued at the world price for refined sugar.

[7] Includes both refined cane sugar and refined beet sugar and is valued at the world price for refined sugar.

[8] The value includes exports of cane and beet sugar, including those refined sugar exports under the sugar re-export program.

Source: USDA, ERS, *Sugar and Sweetener Situation and Outlook Report*, January 2001; USDOC, U.S. Census Bureau, 1997 Economic Census, *Manufacturing Industry Series*, September 1999; LMC International, "The Importance of the Sugar and Corn Sweetener Industry to the U.S. Economy," August 1994 (revised August 2001).

U.S. domestic sugar policy

With the enactment of the 1996 FAIR Act, the domestic policy for sugar was designed to maintain a guaranteed floor price for U.S. producers through the administration of a loan rate purchase program.[54] In accordance with the FAIR Act, the loans were nonrecourse,[55] stipulated on the requirement that the sugar TRQ was set at above 1.5 million short tons.[56] If the annual TRQ allocation did not exceed 1.5 million short tons, the loans were converted to recourse loans and the producers were required to pay a 1-cent-per-pound forfeiture penalty.[57]

U.S. trade policy for sugar

The U.S. trade policy for sugar is guided not only by the minimum import level required for the application of nonrecourse loans established under the FAIR Act, but also by the U.S. market access commitments made under both the NAFTA and the URAA. To keep the U.S. domestic price sufficiently above the fixed loan rates, the United States administers a system of TRQs for raw and refined sugar, blended sugar syrups, and SCPs for Mexico under NAFTA and for WTO member countries in accordance with the URAA.

NAFTA TRQs.—The U.S. schedule of concessions under the NAFTA granted Mexico its own preferential TRQs for raw or refined sugar, blended sugar syrups, and SCPs. The level of the TRQs for raw and refined sugar for Mexico and the precise conditions under which Mexico may ship sugar are contained in a side agreement to NAFTA.[58]

Over the period 1997-99, TRQ levels for Mexico increased by 6 percent for both blended sugar syrups and SCPs containing more than 65 percent by dry weight of sugar; both TRQs increased from 1,639 metric tons to 1,739 metric tons.[59] In addition, the TRQ allocated to Mexico for SCPs containing

[54] The loan rate was fixed at 18 cents per pound for raw sugar and 22.9 cents per pound for refined sugar. If the market price exceeded the loan rate at the time of sale, then the processor would simply sell the sugar on the open market and repay the amount of the loan to the government. Otherwise, if the domestic price fell below the loan rate, the producers could forfeit their sugar under loan to the CCC.

[55] The producers were not required to pay a forfeiture penalty.

[56] Equal to 1.36 million metric tons.

[57] The 1.5-million short ton requirement was repealed in 2001 with the enactment of the Agricultural Appropriations Bill.

[58] The provisions and the validity of the side letter have been brought into question by Mexico, causing the United States and Mexico to enter into extensive negotiations over the quantity of sugar Mexico is allowed to ship to the U.S. under the raw and refined sugar TRQs.

[59] SCPs containing over 65 percent by dry weight of sugar may only be imported if packaged for retail sale.

over 10 percent by dry weight of sugar (but not more than 65 percent) increased by 6 percent as well, from 13,977 metric tons to 14,828 metric tons.[60]

In addition to the preferential TRQ access, Mexico is granted preferential in-quota and over-quota tariff rates. Other countries are granted preferential in-quota rates, but Mexico is the only country that is granted preferential over-quota tariff rates. Nevertheless, in 1999, the preferential over-quota rates on sugar of approximately 159 percent ad valorem equivalent offered to Mexico remained high enough to preclude over-quota imports.

URAA TRQs.—The United States scheduled separate TRQs for raw sugar, refined sugar, SCPs, and blended sugar syrups under the Agreement on Agriculture[61] and a TRQ for cocoa powder containing sugar.[62] Imports within the quota are dutiable at a low (generally zero) in-quota tariff rate, while imports beyond the quota are dutiable at a higher (generally prohibitive) over-quota tariff rate. Also, over-quota imports are subject to an additional special safeguard tariff that is inversely related to the value of the imported product. The higher-valued imports are assessed lower safeguard tariffs. Thus, the actual effective level of the tariff on imports beyond the quota is the over-quota tariff plus the special safeguard tariff. Mexico and Canada are exempt from special safeguard duties under NAFTA.

The raw sugar TRQ is allocated on a country-specific basis among sugar exporting nations in proportion to their average market share of U.S. imports during the selected base period 1975-81. In total, 40 nations hold shares of the U.S. raw sugar TRQ. The Dominican Republic, Brazil, the Philippines, and Australia hold the largest shares of the TRQ, and combined hold more than 50 percent of the total TRQ allocation. Under Uruguay Round commitments, the United States is required to allocate at least 1.12 million metric tons annually. During 1997-99, the actual TRQ allocations exceeded the scheduled minimum requirements. Noticeably, the raw sugar TRQ allocation levels trended downward during the period. Raw sugar TRQ allocation levels equaled 2.1 million metric tons in 1997, 1.6 million metric tons in 1998, and 1.16 million metric tons in 1999. Most of the TRQ-holding countries receive duty-free, in-quota access. In 1999, the ad valorem equivalent for the over-quota tariff rate for raw sugar was approximately 257 percent, and was thus prohibitive.[63]

The level of the refined sugar TRQ scheduled with the WTO is 22,000 metric tons; however, during 1997-99, the actual annual allocation totaled

---

[60] SCPs containing over 10 percent and less than 65 percent by dry weight of sugar may only be imported in bulk.

[61] These TRQs are all provided for in the Additional U.S. Notes to chapter 17 of the HTS and pertinent subheadings.

[62] This TRQ is provided for in additional U.S. notes of chapter 18 of the HTS.

[63] This includes the special safeguard tariff assessed on over-quota imports of raw sugar.

25,000 metric tons. The TRQ was allocated partly to Mexico and Canada; Mexico received 2,954 metric tons, Canada received 10,300 metric tons, and the remaining 11,746 metric tons were allocated on a first-come, first served basis. Practically all in-quota imports entered duty free in 1999 and over-quota imports were assessed a prohibitive average over-quota tariff of 198 percent.[64]

The TRQ allocation for SCPs containing over 10 percent by dry weight of refined sugar, but less than 65 percent, totals 64,709 metric tons, of which Canada receives 90 percent. Canada allocates export licenses for their portion of the TRQ, and only a few exporters own the right to export from Canada to the United States within the TRQ. The remaining 10 percent of the TRQ is allocated on a first come, first-served basis. The SCP TRQ for articles containing more than 65 percent by dry weight of refined sugar is zero, meaning that all imports are dutiable at the over-quota tariff rate. The TRQ for cocoa powder containing sugar is 2,313 metric tons, which is less than 0.1 percent of domestic consumption, and is allocated on a first come, first served basis. In 1999, the ad valorem equivalent of the over-quota tariff for all SCPs was approximately 40 percent.

The blended sugar syrup TRQ quantity is zero, making all imports dutiable at the over-quota rates, which are compound duties (i.e., specific plus ad valorem) based on the total sugar content in the syrup. Thus, the ad valorem equivalent for over-quota imports of blended syrups in 1999 is indeterminate.

Restrictiveness of Trade Barriers

The application of TRQs in this sector results in a great disparity between the U.S. domestic price and the world price of sugar. In 1999, the U.S. domestic price exceeded the world price by 213 percent for raw sugar and 175 percent for refined sugar. Those foreign suppliers that own the right to ship within the TRQ are able to achieve the higher U.S. price as opposed to the low world price of sugar. Thus, the TRQs are essentially filled each year. High fill rates are not always indicative of restrictiveness. However, the high fill rates for sugar do indicate that the TRQs are restricting the flow of trade to the United States, since some foreign suppliers are willing but unable to serve the U.S. market. High-cost, inefficient producers are able to ship sugar to the United States under the TRQs at preferential in-quota rates, while low-cost, efficient producers are precluded from shipping because of the prohibitively high over-quota tariffs.[65] During 1997-99, the TRQs for raw and refined sugar became even more restrictive, as the allocated levels were reduced to the WTO

[64] This includes the special safeguard tariff assessed on over-quota imports of refined sugar.

[65] David W. Scully shows that the current allocation of the U.S. global quota for sugar imports causes the import supply for the United States to have a steeper slope than the global supply curve and that the marginal cost is greater than the world price (see David W. Scully, "Auctioning Tariff Quotas for U.S. Sugar Imports," *Sugar and Sweetener Situation and Outlook Report*, ERS, USDA, May 1998, pp. 17-22).

minimum. Overall, it is TRQ allocations that determine which countries will ship sugar and SCPs to the United States, not economic factors.

Opponents of the U.S. sugar program argue that the high price of U.S. sugar resulting from the restrictiveness of trade barriers (and domestic price supports) is encouraging food manufacturers that use sugar as an input to close plants in the United States and to relocate facilities to other countries.[66] The claim that high U.S. sugar prices are the sole factor for movement across the border to countries such as Mexico is disputed by supporters of the U.S. sugar program, who cite other factors such as lower wages and decreased tax burdens as primary reasons for relocating plants outside the United States.[67] Buzzanell determined in a recent study that while sugar is the leading ingredient by volume for the U.S. confectionery industry, per unit costs for sugar are the lowest of all ingredients used by the industry. In addition to lower sugar costs, Buzzanell said the shift in production from the United States to Mexico's maquiladora industry can be attributed to low labor costs and highly attractive rules of operation.[68]

Previous Work

Numerous studies have assessed the effects of the U.S. sugar program. In 1993, a study by the General Accounting Office (GAO) concluded that the sugar program cost U.S. sugar buyers about $1.4 billion per year.[69] In that report, the loss was partially offset by gains to sugar producers of $561 million and fructose producers of $548 million. Thus, according to the GAO, the net cost imposed by the sugar program on the U.S. economy was $291 million a year. Following the GAO study, Polopolus concluded that costs to sugar buyers resulting from the sugar program tend to be overstated because the present world price is distorted by "...extensive intervention of practically all governments of the world in their domestic sugar markets."[70] In 1998, Haley confirmed Polopolus' assertion and concluded that the 1993 GAO study

[66] Written statement of the Coalition for Sugar Reform before the USITC, Jan. 10, 2002, p. 1. See also Mark A. Groombridge, "America's Bittersweet Sugar Policy," Trade Briefing Paper No. 13, Center for Trade Policy Studies, Dec. 4, 2001.

[67] See testimony of Jack Roney, Director of Economics and Policy Analysis, American Sugar Alliance, before the USITC, hearing transcript, Dec. 4, 2001, p. 196.

[68] Peter Buzzanell, "U.S. Confectionery Companies: The Move to Mexico–Encouraged by What Cost?" Paper prepared for the American Sugar Alliance, Aug. 31, 2001.

[69] United States General Accounting Office, *Sugar Program: Changing Domestic and International Conditions Require Program Changes*, GAO/RCED-93-84, Washington, DC, April 1993.

[70] Polopolus, L.C., "Dispelling the World Price and Sugar Subsidy Myths," Food and Resource Economics Department, Institute of Food and Agricultural Sciences, University of Florida, Staff Paper SP 93-19, August 1993.

overestimated the net costs of the U.S. sugar program.[71] Haley estimated that the sugar program costs U.S. sugar buyers about $674 million a year, while U.S. sugar producers gained $437 million and fructose producers gained $203 million a year because of the sugar program. Haley's work suggests that the net cost of the sugar program to the U.S. economy is $33 million a year.

In June 2000, the GAO issued an update of the 1993 report, and concluded that the costs of the U.S. sugar program to sugar buyers are increasing annually.[72] The GAO estimated the cost to domestic sweetener users (i.e., sugarcane refiners, food manufacturers, and final consumers) at approximately $1.5 billion in 1996 and $1.9 billion in 1998, nearly a 27-percent increase.[73] The Coalition for Sugar Reform asserts that the increased cost has been borne inequitably by industrial users, as well as by final consumers.[74]

The increased cost of the sugar program is positively correlated with the drop in the world price of sugar. The lower the world price, the higher are the costs of the program. In the 2000 study, the GAO estimated that the U.S. sugarcane and sugar beet producers together received $800 million in benefits in 1996 and $1 billion in 1998. The GAO estimated that net losses to the economy from the sugar program increased to $900 million in 1998.[75] Schmitz criticized the 2000 GAO study for several reasons, including the "highly unrealistic" assumption of 100 percent pass through of benefits to U.S. consumers from the removal of the sugar program;[76] inaccurate adjustments in

---

[71] Haley, Stephen, "Modeling the U.S. Sweetener Sector: An Application to the Analysis of Policy Reform," International Agricultural Trade Research Consortium, Working Paper #98-5, August 1998, found at *http://www1.umn.edu/iatrc/workpap.html*.

[72] United States General Accounting Office, *Sugar Program: Supporting Sugar Prices Has Increased Users' Costs While Benefitting Producers*, GAO/RCED-00-126, Washington, DC, June 2000.

[73] In testimony before the Commission, Jack Roney, Director of Economics and Policy Analysis of the American Sugar Alliance, defines sugar users as food manufacturers that use sugar as an input and consumers as the final consumer of the product. Mr. Roney argued on behalf of the American Sugar Alliance that the concentration of benefits from the removal of the sugar program would be with the food and manufacturing companies, not the final consumers (hearing transcript, p. 196).

[74] Written statement of the Coalition for Sugar Reform before the USITC, Jan. 10, 2002, p. 1.

[75] The American Sugar Alliance, a national coalition of growers, processors, and refiners of sugarcane and sugar beets and producers of corn sweetener, disagreed with the GAO's analysis of the U.S. sugar program, arguing that the analysis was fundamentally flawed. See testimony of Jack Roney, Director of Economics and Policy Analysis, American Sugar Alliance, before the USITC, hearing transcript, Dec.4, 2001, p. 167.

[76] Schmitz argues that pass-through of benefits would be roughly 25 percent to 35 percent, at most.

output (i.e., output is not responsive to price changes); and an unrepresentative world price based on the removal of the U.S. policies and retention of trade distorting policies of other major players in the world market, as well.[77]

In 1999, the Food and Agriculture Organization published a study by Michael Wohlgenant on the effects of trade opening on the global sugar market.[78] Wohlgenant found that removal of trade barriers for sugar among all countries would cause the world market price of sugar to increase by 43.2 percent (compared to the base price of US$0.12 per pound for 2005). The United States, Japan, and India would experience the largest increases in imports; U.S. imports of sugar would increase by 34.6 percent. Wohlgenant decomposed the impacts of global trade liberalization. He assessed the impact of complete trade liberalization on the part of developed counties and found that the world price of sugar would increase by 9.8 percent.[79] He also assessed the impact of complete trade liberalization on the part of developing counties and found that the world price of sugar would increase by 16.7 percent.[80]

A 1999 study by Sheales, Gordon, Hafi, and Toyne used a partial equilibrium model of the global sugar market to estimate the impacts of liberalization in sugar.[81] Sheales et al. found that full sugar market liberalization in the United States would lift world prices by 17 percent. Removal of the sugar program would reduce the domestic price of sugar, saving U.S. sugar buyers an estimated $1.6 billion a year (in 1998-99 dollars). The net gain to the U.S. economy as a whole would be an estimated $456 million.

In its previous import restraints report, the USITC estimated an overall net welfare gain of $986 million from removal of the TRQs on sugar and sugar containing products in 1996.[82] In the same analysis, imports increased by $601 million and domestic sugar production declined by $556 million.

---

[77] Andrew Schmitz, written comments on *Sugar Program: Supporting Sugar Prices Has Increased Users' Costs While Benefitting Producers*, GAO/RCED-00-126, Washington, DC, June 2000.

[78] Michael K. Wohlgenant, *Effects of trade liberalization on the world sugar market*, (Rome: Food and Agriculture Organization of the United Nations, 1999).

[79] The developed countries under consideration were the United States, Canada, European Union, other Western Europe, Australia, New Zealand, Japan, South Africa, and Israel.

[80] The developing countries under consideration were Brazil, China, India, Indonesia, and the Republic of Korea.

[81] Terry Sheales, Simon Gordon, Ahmed Hafi and Chris Toyne, *Sugar: International Policies Affecting Market Expansion*, Australian Bureau of Agricultural and Resource Economics, Research Report 99.14, Canberra, Australia, November 1999.

[82] USITC, *The Economic Effects of Significant Import Restraints, Second Update 1999*, publication 3201, May 1999.

The Effects of Liberalization

The model base case estimates show that liberalizing the sugar and sugar-containing products TRQs and eliminating domestic price supports in 1999 results in an estimated economic welfare gain of $420 million to the U.S. economy.[83] Declining sugar and sugar containing product prices contribute to an economic welfare gain from liberalizing sugar sector.[84] In particular, the base case estimates show that the real sugar prices in the United States would decline by about 6.2 percent. The real prices of sugar-containing products would decline by less than 1 percent. Table 4-5, part A presents the base case model estimates of employment, output, trade, and price effects of unrestricted imports in the U.S. sugar market.

The upstream sugar crops farm sector would decline by about 9.4 percent in output and employment, which translates to declines of $240.1 million in output and displacement of 350 FTE workers. Employment and output were estimated to decline by about 9.4 percent in sugar manufacturing, which translates to a loss of about 2,390 FTE jobs and a drop of $748.9 million in output. Employment and output reductions in the sugar-containing sectors are significantly smaller, about 0.2 percent. In both sugar manufacturing and sugar-containing products sectors, generally imports increase and exports decline. The model estimates show that U.S. sugar imports would increase by $435.8 million, a 108 percent increase.

Generally, the rest of the U.S. economy would expand as factors reallocate away from sugar manufacturing and sugar crops farming and into other sectors. The model estimates that overall domestic employment would grow by about 140 FTE jobs after removing the U.S. sugar TRQs.

In the CGE model, the response of sugar and sugar containing product imports to relative price changes is determined by substitution elasticities between domestic and imported varieties of the same products and by import supply elasticities.[85] It is possible that the estimated import supply elasticity for

---

[83] The 1999 welfare impact of the sugar TRQs is smaller than the previously cited estimate by the USITC for 1996 because of several factors. The most significant factor is that the analysis of 1996 sugar TRQs showed substantially larger imports relative to 1999. The price gaps applied in the analysis of 1996 are similar to those used here for analyzing restraints in 1999.

[84] The change in the composite price of sugar is an appropriately weighted average of the changes in domestic and imported sugar prices. In this simulation, the import price decline is larger than the domestic price decline and is largely driven by the trade policy being removed. See the "CGE Data" section, appendix D for a discussion of quantifying sugar policies.

[85] For a complete list of substitution or Armington elasticities used in the model, see appendix table D-1. For recent estimates of Armington elasticities and a discussion of the issues, see Michael P. Gallaway, Christine A. McDaniel, and Sandra A. Rivera, "Industry-level estimates of U.S. Armington elasticities," USITC, Office of Economics Working Paper No. 2000-09-A, Sept. 2000, found at Internet address *ftp://ftp.usitc.gov/pub/reports/studies/ec200009a.pdf,* retrieved Dec. 31, 2001.

Table 4-5
Sugar: Selected economic effects of TRQ removal, 1999

Sector	Employment		Output		Imports		Exports		Composite price[3]
	FTE[1]	Percent	Value[2]	Percent	Value[2]	Percent	Value[2]	Percent	Percent
A. Base case scenario, base parameters; economywide welfare gain of $420 million due to the elimination of import restraints.									
Liberalized sector:									
Sugar manufacturing	-2,390	-9.4	-748.9	-9.39	435.8	108.0	-11.2	-7.4	-6.2
Upstream sector:									
Sugar crops	-350	-9.4	-240.1	-9.36	-0.3	-9.0	-0.3	-9.0	0.01
Rest of economy:									
Agriculture	100	(6)	28.4	(6)	-3.2	(6)	6.8	(6)	(6)
Forestry, Fisheries	30	(6)	4.1	(6)	-1.1	(6)	0.9	(6)	(6)
Construction	0	(6)	-1.8	(6)	(4)	(4)	(4)	(4)	(6)
Wet corn milling	0	(6)	-1.2	(6)	1.0	0.5	(6)	(6)	(6)
Other processed foods[5]	-20	(6)	0	(6)	79.3	0.3	3.8	(6)	-0.1
Durable manufacturing	1,160	(6)	298.8	(6)	-97.0	(6)	70.6	(6)	(6)
Nondurable manufacturing	210	(6)	36.5	(6)	-29.1	(6)	8.9	(6)	(6)
Finance, insurance, and real estate	100	(6)	90.7	(6)	-2.3	(6)	3.5	(6)	(6)
Mining	20	(6)	9.3	(6)	-8.4	(6)	0.4	(6)	(6)
Other services	1,610	(6)	124.8	(6)	-4.7	(6)	9.4	(6)	(6)
Transportation, communications, and utilities	-230	(6)	-24.2	(6)	-23.8	(6)	8.1	(6)	(6)
Wholesale and retail	-80	(6)	-4.7	(6)	(4)	(4)	(4)	(4)	(6)
B. Alternative Scenario 1 - base case substitution elasticity; import supply elasticity of 50; economywide welfare gain of $508 million due to the elimination of import restraints.									
Liberalized sector:									
Sugar manufacturing	-2,880	-11.3	-899.9	-11.3	553.3	137.1	-13.5	-9.0	-7.53
Upstream sector:									
Sugar crops	-420	-11.2	-288.5	-11.2	-0.4	-10.8	-0.4	-10.8	0.01
Rest of economy:									
Wet corn milling	0	(6)	-1.0	(6)	1.0	0.5	0.1	(6)	(6)
Other processed foods[5]	50	(6)	21.6	(6)	74.6	0.3	6.0	(6)	-0.1
All other sectors	3,340	(6)	650.6	(6)	-186.9	(6)	130.7	(6)	(6)

C. Alternative Scenario 2 - substitution elasticity of 5; import supply elasticities of 50; economywide welfare gain of $1,020 million due to the elimination of import restraints.

Liberalized sector:									
Sugar manufacturing	-13,180	-51.7	-4,125.7	-51.7	2,446.7	606.3	-70.2	-46.4	-15.0
Upstream sector:									
Sugar crops	-1,940	-51.6	-1,322.5	-51.6	-1.7	-50.1	-1.7	-50.1	0.01
Rest of economy:									
Wet corn milling	-10	-0.1	-3.5	(6)	3.1	1.5	0.9	0.1	(6)
Other processed foods[5]	310	(6)	129.5	(6)	85.9	0.3	28.4	0.1	(6)
All other sectors	16,580	(6)	3,389.8	(6)	-1,443.6	-0.1	905.2	0.1	(6)

[1] Full-time equivalents.
[2] In millions of dollars in base year prices.
[3] Price of the composite good (i.e., imports and domestic production).
[4] Not applicable or nontraded sector.
[5] Impacts for sectors covering sugar-containing products have been aggregated with impacts for other processed foods.
[6] Less than 0.05 percent in absolute value.

Note.—Base case scenario Armington elasticities for every model sector are specified in appendix D, table D-1; all price wedges and methodology are specified for each restraint on pp. D-16 through D-17.

Source: USITC estimates.

these products is biased. For example, because import supply elasticities were estimated using data from a market distorted by country-specific quotas, the estimated parameters could be biased downward. Thus, if sugar were supplied freely from the entire world market, a larger import supply elasticity could be expected. In the base case, the import supply elasticity for sugar is 6.667. For the alternative scenarios, 50 is used, the same value applied in many other commodities. This alternative import supply elasticity is equivalent to assuming an essentially flat import supply curve. The results of this scenario can be found in table 4-5, part B.[86]

The overall impacts of trade liberalization are similar to the base case results. As expected, with a larger import supply elasticity for sugar, U.S. sugar imports increase by more without affecting the world sugar price as much as in the base case. Thus, the composite price of sugar and sugar containing products declines by more than in the base case.

The parameter estimates relied upon for the base case simulation suggest that imported sugar is not a close substitute for domestic sugar. However, one might expect that imported sugar is indeed a close substitute for domestic sugar. Because the estimates of the substitution elasticities were empirically estimated using trade and price data within a market distorted by a complex quota system, it is possible that the estimates have been biased downward. To consider the possibility that certain products are much better substitutes than in the base case, the Commission performs an alternative simulation of liberalization of sugar and sugar containing products with an assumed substitution elasticity of 5. The results appear in table 4-3, part C.[87] As expected, if imported sugar is assumed to be a close substitute to domestic sugar, trade liberalization leads to considerably larger increases in imports and larger declines in domestic production. For example, the U.S. sugar manufacturing sector declines by about 52 percent.

The results in table 4-5 suggest that the net benefits of trade liberalization increase as sugar imports become more price-sensitive. In the base case, the economic welfare gain is $420 million. With the import supply elasticity set to 50 in alternative scenario 1, economywide welfare gain increases to $508

[86] In the base case, the import supply elasticity for manufactured sugar is 6.667 and the import supply elasticities for sugar containing products are 50. In the sensitivity analysis reported in table 4-5, parts B and C. the import supply elasticity for manufactured sugar has been increased to 50.

[87] In the base case, the elasticities of substitution between domestic and imported sugar is 1.7 and the elasticities of substitution between domestic and imported sugar containing products range from 1.1 to 2.7 (appendix table D-1). In table 4-5, part C, the sugar and all sugar containing products substitution elasticities are increased to 5, an *assumed* value that is about twice as large as that used in several recent trade analyses. See K. Huff, H. Hanslow, T. Hertel, and M. Tsigas, "GTAP Behavioral Parameters" in T.W. Hertel, editor, *Global Trade Analysis: Modeling and Applications* (NY: Cambridge University Press, 1997).

million. Increasing the substitution elasticity to 5 in alternative scenario 2 yields an economywide welfare gain of $1,020 million.[88]

Peanuts

Since 1934, the United States has had programs designed to increase or stabilize domestic peanut prices. Edible peanuts produced by domestic quota holders within the national poundage quota may be placed on loan with the CCC at the quota support price, and quota peanuts sold into the domestic market tend to sell at prices close to the quota support price.[89] Peanuts grown in the United States by farmers who do not have quotas and by quota holders in excess of their poundage quotas (known as additional peanuts) cannot be sold into the edible market, but must be exported, sold into the domestic crush market, or placed under loan with the area growers' association at a substantially lower support price.[90] Some elements of the peanut program were modified by the FAIR Act, which established U.S. farm policy for marketing years (MY)[91] 1996-2001, but the basic structure remains in place.[92]

Table 4-6 presents data on U.S. production, imports, and exports of peanuts during MY 1997-99. The United States produced approximately $1 billion of peanuts annually, representing about 5 percent to 6 percent of global

[88] The Commission also examined the sensitivity of assumption that U.S. sugar exports are imperfect substitutes with domestically used sugar (see the "Trade Equilibrium" section, appendix D). Without that assumption, the implications of trade liberalization are similar to those presented in table 4-5, part A. The composite price of sugar declines by 6.2 percent; output and employment in sugar manufacturing decline by 8.9 percent; imports of sugar increase by 109 percent; and economic welfare improves by $407 million. Sugar exports, however, increase by 11 percent. This result is intuitively appealing: trade liberalization causes U.S. sugar prices to decline and thus U.S. exports become more competitive in world markets.

[89] The national poundage quota was 1,133,000 short tons (1,027,900 metric tons (mt)) in marketing year 1997, rising to 1,166,990 short tons (1,058,700 mt) in marketing year 1998, and 1,180,000 short tons (1,070,500 mt) in marketing year 1999. The poundage quota was also 1,180,000 short tons in marketing year 2000 and marketing year 2001. The annual poundage quotas, going back to 1978, can be found on the Internet at *http://www.peanut-shellers.org/Facts/Poundage/poundage.html*, retrieved October 25, 2001.

[90] The support level for peanuts produced within the national poundage quota was $610 per short ton during marketing year 1997-99. Additional peanuts received domestic support of $132 per short ton in marketing year 1997 and $175 per short ton in marketing year 1998 and marketing year 1999. See support levels found at Internet address *http://www.peanut-shellers.org/Facts/Poundage/poundage.html,* retrieved Oct. 25, 2001.

[91] The marketing year for peanuts is August 1 through July 31. For example, MY 1997 runs from Aug. 1, 1997 through July 31, 1998.

[92] The national poundage quota was lowered under the FAIR Act, from 1,350,000 short tons (1,224,700 mt) in marketing year 1995 to 1,100,000 short tons (998,000 mt) in MY 1996.

Table 4-6
Peanuts (farmers' stock basis[1]): Summary data, 1997-99[2]

Item	1997	1998	1999
Production *(million dollars)*	1,002	1,125	973
Employment *(FTEs)*	([3])	([3])	([3])
Imports[4] *(million dollars)*	71	77	74
Exports *(million dollars)*	222	184	223

[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] The marketing year for peanuts is Aug. 1 through July 31.

[3] Not available.

[4] Includes imports of peanut butter and peanut paste.

Source: Production and employment: "Oil Crops Outlook," USDA, Economic Research Service (ERS), Sept. 17, 2001, Dec. 13, 2000, and Dec. 13, 1999; Imports and exports: Compiled from USDOC official statistics.

production.[93] Roughly 20 percent of U.S. production, valued at $200 million, is exported annually. In contrast, only about $75 million worth of imports enter the country each year, including shipments of peanut butter and peanut paste. The United States remains a net exporter of peanuts due to favorable climatic conditions for growing peanuts in a number of Southern States. U.S. farmers holding quota allocations have an incentive to overproduce to ensure they meet their allocation each and every year. Furthermore, any additional quota would be allocated on the basis of which farmers produce additional peanuts. Certain farmers overproduce to ensure they will receive future peanut quotas. Most of this overproduction is eventually exported.

Nature of Trade Barriers

Limitations on peanut imports into the United States have been in effect since 1953. These limitations were carried out under the authority of section 22 of the Agricultural Adjustment Act.[94] Starting in 1995, section 22 quotas were replaced by a TRQ, as required by the URAA. Under that agreement, in 1995, imports of peanuts and certain peanut products became subject to an annual TRQ quantity of 30,393 mt (shelled basis), with the quota year (QY)

[93] China and India are by far the largest world producers of peanuts, together producing approximately 65 percent of global output.

[94] For additional background on both the U.S. domestic peanut program and the import quotas in effect before 1995, see *Peanuts: Report to the President on Investigation No. 22-52 Under Section 22 of the Agricultural Adjustment Act, as Amended*, USITC publication 2369, March 1991, pp. A-2 through A-16.

running from April 1 through March 31.[95] This TRQ trigger level increased each year during MY 1997-99 (table 4-7). Note that Argentina was allocated its share of the TRQ based on historical trade flows when the TRQ was established in 1995. The rates of duty on imports within the TRQ are substantially lower than the duties on over-quota imports (table 4-8). Imports of peanut butter and peanut paste also became subject to a TRQ, starting Jan. 1, 1995. The original TRQ quantity of 19,150 mt gradually increased to 20,000 mt in 2000.[96] More than 70 percent of the quota for peanut butter and peanut paste is allocated to Canada, and nearly 20 percent is allocated to Argentina.

Restrictiveness of Trade Barriers

The TRQs on peanuts and certain peanut products (table 4-7) were completely or essentially filled during each QY during the MY 1997-99 period. These fill rates indicate that foreign producers would ship additional quantities to the United States under the in-quota tariffs, if given the opportunity. Imports of peanut butter from Canada filled or essentially filled Canada's country-specific TRQ for peanut butter and peanut paste during 1997-99;[97] Argentina averaged a fill rate of nearly 95 percent of its country-specific quota over the same period. The remainder of the peanut butter and peanut

[95] Imports of peanuts and certain peanut products from Mexico are not subject to the overall TRQ. However, such imports from Mexico are subject to a TRQ under NAFTA. Imports under the NAFTA TRQ trigger quantity enter duty-free, but quantities above the limitation are subject to a higher rate of duty. The TRQ level for 1995 was 3,478 mt and will increase annually through 2007. Beginning in 2008, imports from Mexico will not be subject to TRQ limitations and will be free of duty if of Mexican origin. See Robert Skinner, "Issues Facing the U.S. Peanut Industry During the Seattle Round of the World Trade Organization," *Oil Crops Situation and Outlook*, USDA, ERS, October 1999, p. 41, for more information on over-quota duty rates and TRQ quantities for imports from Mexico.

[96] In 1997, in-quota imports of peanut butter and peanut paste were dutiable at 0.6 cents per kilogram; in 1998 and 1999, in-quota imports entered free of duty. Over-quota imports from NTR countries are dutiable at 135.7 percent; over-quota imports from non-NTR countries are dutiable at 155.0 percent. Imports of peanut butter and peanut paste from Mexico are not subject to the TRQ established under the URAA, but they are subject to NAFTA provisions. Under NAFTA, imports from Mexico must be made with peanuts of Mexican origin to qualify as Mexican peanut butter and peanut paste. See David Skully, "U.S. Tariff-Rate Quotas for Peanuts," *Oil Crops Situation and Outlook*, USDA, ERS, October 1999, p. 50.

[97] The QY for the TRQ on peanut butter and peanut paste is a calendar year.

Table 4-7
WTO and NAFTA tariff-rate quota quantities for peanuts, except peanut butter and peanut paste, 1997-2000

Year[1]	Mexico[2] (NAFTA TRQ)	Argentina (WTO TRQ)	Other (WTO TRQ)	Total NAFTA and WTO TRQs
		Metric tons		
1997	3,690	33,365	6,033	43,088
1998	3,801	36,877	7,024	47,702
1999	3,915	40,388	8,015	52,318
2000	4,032	43,901	9,005	56,938

[1] For Mexico, the QY is a calendar year; for all other countries, it is an Apr. 1 through Mar. 31 marketing year.

[2] NAFTA provides for expanding TRQs on "peanuts (ground nuts), shelled or not shelled, blanched or otherwise prepared or preserved (except peanut butter), that are qualifying goods entered under HTS subheadings 9906.12.01, 9906.12.04, and 9906.20.03 in any calendar year." Peanuts are charged against the quota on the basis of 75 kilograms of peanuts shelled for each 100 kilograms of peanuts in the shell.

Source: Robert A. Skinner, "Issues facing the U.S. peanut industry during the Seattle Round of the World Trade Organization," *Oil Crops Situation and Outlook*, USDA, ERS, October 1999, p. 41; and 2001 Harmonized Tariff Schedule of the United States.

Table 4-8
U.S. import tariff rates for peanuts, except peanut butter and peanut paste, 1997-2000

Year	In-shell peanuts, in-quota[1]	In-shell peanuts, over-quota rate, NTR	Shelled peanuts, in-quota[2]	Shelled peanuts, over-quota rate, NTR
	Cents/kg	*Ad valorem percent*	*Cents/kg*	*Ad valorem percent*
1997	9.35	178.3	6.6	143.4
1998	9.35	173.4	6.6	139.5
1999	9.35	168.6	6.6	135.7
2000	9.35	163.8	6.6	131.8

[1] HTS subheading 1202.10.40.

[2] HTS subheading 1202.20.40. Certain peanut products under HTS subheadings 2008.11.25 and 2008.11.45 also have an in-quota duty of 6.6 cents per kilogram.

Source: Harmonized Tariff Schedule of the United States.

paste TRQ, totaling 1,850 mt and allocated to a large group of developing countries on a first come, first served basis, was filled at a rate far below 50 percent of the available in-quota quantity. This fill rate indicates either a lack of capacity among developing countries to fill the demand or an in-quota quantity that is not sufficiently large enough for economical shipment by foreign suppliers.

Previous Work

A 1993 study by the GAO found that the peanut program creates a social welfare loss of $53 million to $57 million.[98] In 1999, the Commission concluded that removal of the peanuts TRQ would lead to a 6.7 percent increase in domestic consumption of peanuts; the net welfare gains from removal of the program were estimated at $8 million.[99]

The Effects of Liberalization

The simulation results are presented in table 4-9 and show the estimated impact of removing the TRQ. Commission estimates, using the COMPAS model, suggest that removal of the TRQ would cause imports to increase by 35.7 percent and real prices to fall by 4.4 percent.[100] As a result of lower domestic prices, domestic sales by volume of U.S.-produced peanuts would decline by 1.84 percent. The net welfare impact of removing the peanuts TRQ is a gain of $2.2 million.

Table 4-9
Peanuts: Selected economic effects of TRQ removal, 1999

Item	Estimate
Change in composite price *(percent)*	-4.4
Output change:	
Value *(million dollars)*	-49.6
Volume *(percent)*	-1.8
Imports change:	
Value *(million dollars)*	9.8
Volume *(percent)*	35.7
Welfare *(million dollars)*	2.2

Source: USITC estimates.

Cotton

During marketing years (MY) 1997-99, the United States produced about 16.6 million bales of cotton annually, representing about 18.8 percent of global production.[101] U.S. textile mills annually consumed 10.7 million bales and an average of 6.2 million bales were exported. Exports of U.S. cotton accounted

[98] GAO, *Peanut Program: Changes Are Needed to Make the Program Responsive to Market Forces*, GAO/RCED-93-18, February 1993.

[99] USITC, *The Economic Effects of Significant Import Restraints, Second Update 1999*, publication 3201, May 1999.

[100] See appendix D for further discussion of the COMPAS model.

[101] The MY for cotton is August 1 through July 31. For example, MY 1997 runs from Aug. 1, 1997 through July 31, 1998. A bale of cotton weighs approximately 498.5 lbs., including packaging materials. Each bale contains approximately 480 lbs. of cotton.

for 18 percent to 28 percent of world trade in cotton over the 3-year period, making the United States the world's largest raw cotton exporter.[102] In contrast, only a small volume of imports entered the country each year. Table 4-10 presents data on production and trade in cotton for MY 1997-99. In MY 1999, the value of production was estimated at $4.2 billion, with exports of $1.7 billion. Imports generally represent between 0 and 5 percent of the volume of U.S. consumption.[103] Imports' share of consumption remained in the high end of this range in MY 1998 due to higher imports and a sharp drop in United States harvested area brought on by lower world cotton prices.[104]

The 1996 FAIR Act governs U.S. domestic programs in the cotton sector. The FAIR Act was designed to keep U.S. cotton competitive in world and domestic markets and maintain a better balance between production and total use by giving producers more flexibility to respond to market prices. The 1985 Food Security Act provides most of the guiding principles and provisions of the current cotton program. It provided the marketing loan program credited with the significant turnaround in the overall health of the U.S. cotton economy since the mid-1980s.[105]

Table 4-10
Cotton: Summary data,[1] marketing years 1997-99

Item	1997	1998	1999
Production *(million dollars)*	7,042	4,914	4,203
Product acreage *(1,000 hectares[2])*	5,425	4,324	5,433
Imports *(million dollars)*	4	130	34
Exports *(million dollars)*	2,810	1,534	1,672

[1] Production data are used instead of shipment data and acreage data are used instead of employment data because they are more meaningful for an agricultural commodity.

[2] One hectare equals 2.471 acres.

Source: Compiled from official statistics of the USDA, FAS, Cotton: World Markets and Trade, found at Internet address *http://fas.usda.gov/cotton/*, and Cotlook Ltd., Cotlook A - Index, found at *www.cotlook.com/*, retrieved Nov. 21, 2001.

[102] According to USDA data, Uzbekistan was the second largest and Australia the third largest world exporters of cotton in MY 1999. Added together, Uzbekistan and Australia export approximately 700,000 more bales than the United States (6.9 million bales vs. 6.2 million bales). See USDA, FAS, *Cotton: World Markets and Trade*, Dec. 1999, table 5.

[103] Imports were 0.1 percent of the quantity consumed in 1997, 4.3 percent in 1998, and 0.7 percent in 1999. See John Fry, *Industry & Trade Summary: Cotton*, USITC publication 3391, January 2001, table B-6.

[104] Ibid.

[105] USDA, FAS, *Cotton: Background to the 1995 Farm Legislation*, Agricultural Economic Report, No. 706, April 1995, iii and 13-14; and USDA, ERS, "Provisions of the 1996 Farm Bill," *Agricultural Outlook*, April 1996, p. 9.

Nature of Trade Barriers

Cotton imports are controlled by TRQs and two mechanisms for expanding quotas for imports at low tariffs: limited import quotas and special import quotas.[106] TRQs, limited import quotas, and special import quotas are allocated for various staple lengths. Most of the TRQ amounts are administered on a first-come, first-served basis, although limited in-quota quantities are allocated to specific countries based on historical shipments.[107] Limited import quotas were established in the FAIR Act. The global import quota for upland cotton is expanded whenever the average monthly price of the base quality of cotton in designated spot markets exceeds 130 percent of the average price in these markets for the preceding 36 months. The quota is expanded by an amount that is equal to 21 days of domestic mill consumption of upland cotton (seasonally adjusted) in the most recent 3 months for which data are available.[108] Special import quotas for upland cotton apply when, for any consecutive 4-week period, the weekly average price quotation for the United States-Northern Europe price exceeds the Northern Europe price by more than 1.25 cents per pound.[109] The quota is then expanded by an amount that is equal to one week's domestic mill consumption of upland cotton at the seasonally adjusted rate (more than 200,000 bales, at current annual consumption) for the most recent 3 months for which data are available.[110] Total imports per marketing year under the special import quotas cannot exceed 5 weeks' use by domestic mills, which is approximately 1 million bales (218,000 mt).[111] Limited import quotas are not permitted if a special import quota is in effect.

---

[106] The TRQs replaced absolute quotas previously imposed under section 22 quotas of the Agricultural Adjustment Act. Both the special import quota and the limited global import are considered in-quota quantities for purposes of various trade agreements, so these imports are not subject to over-quota tariffs. See HTS chapter 99 and pertinent subheadings for more information.

[107] For example, India and Pakistan are granted approximately 909 (mt) of the 20,207 mt TRQ under HTS subheading 5201.00.14 for cotton, not carded or combed, having a staple length under 28.575 mm, with exceptions. For more information on cotton TRQ amounts, see WTO Schedule XX (the U.S. national schedule) and HTS chapter 52.

[108] Limited global import quotas are not permitted if a special import quota is already in effect. See USDA, ERS, *Provisions of the Federal Agriculture Improvement and Reform Act of 1996*, Agricultural Information Bulletin, No. 729, Sept. 1996, p. 12, and John Fry, *Industry & Trade Summary: Cotton*, USITC publication 3391, January 2001, p. 40.

[109] In addition, the projected ratio of U.S. ending stocks to total cotton use for the marketing year must be more than 16 percent. USDA, FAS releases United States - Northern Europe and Northern Europe prices each week at Internet address *http://www.fsa.usda.gov.*

[110] USDA, ERS, *Provisions of the Federal Agriculture Improvement and Reform Act of 1996*, Agricultural Information Bulletin, No. 729, September 1996, p. 12.

[111] John Fry, *Industry & Trade Summary: Cotton*, USITC publication 3391, January 2001, p. 40.

Limited import quotas and special import quotas are permitted under WTO rules because they facilitate rather than limit trade relative to the existing TRQs. They are implemented in response to market conditions in which the U.S. price is high relative to the world price or relative to the recent past and U.S. textile mills want additional imports beyond the TRQs established under the URAA.[112] U.S. mills then purchase additional imports at low tariff rates to remain cost-competitive with foreign textile producers.

TRQs were created by proclamation for cotton imports after the United States signed the Agreement on Agriculture, which entered into force on January 1, 1995. In-quota imports became subject to existing, pre-Uruguay Round tariff rates, while over-quota cotton tariffs were set at 36.9 cents per kilogram for cotton and 9.2 cents per kilogram for cotton waste. These tariffs were reduced by the minimum percentage required (15 percent) in equal annual installments over the 6-year implementation period, to 31.4 cents per kilogram (approximately 30 percent ad valorem equivalent) and 7.8 cents per kilogram, respectively, in 2000.[113] Under the minimum access provisions of the URAA, in-quota imports were set at 3 percent for a 1986-88 base period of U.S. domestic consumption, rising to 5 percent of base-year consumption by the end of the implementation period. Under NAFTA, Mexico was granted an in-quota amount totaling 10,000 mt.

Restrictiveness of Trade Barriers

The various TRQs in place for cotton imports entering the United States are generally filled on a first-come, first-served basis. Approximately 3 percent of the total in-quota quantities are allocated country-by-country, all under the TRQ for short staple cotton in HTS subheading 5201.00.14. Of the four fill rates for TRQs in 1999, two were zero, one was 5.8 percent (HTS subheading 5201.00.60), and the fourth was 36.7 percent (HTS subheading 5201.00.14). The low fill rates are attributable largely to two conditions. First, in the case of long and extra-long staple cotton TRQs (HTS subheadings 5201.00.34 and 5201.00.60), the United States imports very little because U.S. growers produce sizable quantities every year; in fact, domestic supply far outstrips the demand from U.S. textile mills. Second, filling the short staple cotton TRQ is somewhat hampered by country-specific quotas, most of which are too small to be commercially viable.[114] Country-specific in-quota allocations account for 12.6 percent of the short staple TRQ.

---

[112] Wayne Bjorlie, Director, Fibers Group, USDA, FAS, interview by USITC staff, May 22, 2000.

[113] USDA, FAS, *Cotton Factsheet: An Overview of the Agricultural Provisions of the Uruguay Round*, at Internet address *http://www.fas.usda.gov/itp/policy/gatt/cotton.html*, retrieved Oct. 4, 2001.

[114] Two extreme examples are Iraq, which receives 88 kg; and Haiti, which receives 107 kg, of the 20,207 mt TRQ under HTS subheading 5201.00.14 – cotton, not carded or combed, having a staple length under 28.575 mm. See notes to ch. 52 of the HTS of the United States.

Taken together, special quota imports accounted for over 83 percent of total U.S. imports in 1999, by value, and accounted for a similar percentage of U.S. imports in 1997 and 1998. These facilitating quotas greatly expanded market access for foreign cotton in the United States. The value of imports under all TRQs totaled approximately 13 percent of imports in 1999. Nearly all U.S. imports enter duty free, whether through special quota imports, under HTS subheadings (e.g., 5201.00.12) or from certain countries, like Mexico, receiving duty-free treatment (e.g., Mexican cotton under HTS subheading 5201.00.80).[115] Over-quota imports are minimal, due in large part to the 31.4 cents per kg tariff charged on those entries.

Previous Work

In the 1995 update of this report, removal of the 1993 cotton quota resulted in an estimated 12.7 percent increase in imports of cotton in the United States; the domestic supply of cotton declined by less than 0.05 percent. The economywide costs of the cotton program were estimated at $300,000 per year. In 1999, however, the Commission determined that prevailing market conditions made it difficult to evaluate the TRQ. A more recent study, Reeves, et al., used a partial equilibrium model of production, consumption, and trade in fibers, textiles and apparel to examine the implications of U.S. policies.[116] The authors' results suggest that elimination of subsidies to U.S. cotton producers resulted in a 12 percent decline in U.S. cotton production from its 1999 level.

The Effects of Liberalization

The model estimates show that the overall effect of liberalizing the cotton TRQs and eliminating domestic price supports in 1999 is an economic welfare gain of $4 million to the U.S. economy. Contributing to the gain in economic welfare is the decline in real cotton prices as a result of liberalization. In particular, the model estimates show that real cotton prices in the United States would decline by about 0.1 percent. Table 4-11 presents the model estimates of employment, output, trade and price effects of unrestricted imports in the U.S. cotton market.

Due to lower U.S. cotton prices, the downstream textiles manufacturing sectors would expand output and employment by $8.9 million and 97 FTE jobs, respectively. The model estimates show that U.S. imports of cotton would increase by about 5.2 percent.

The rest of the U.S. economy would not be affected very much by liberalizing cotton trade. The model estimates that overall employment in the U.S. economy would grow by 16 FTE jobs due to removing the U.S. cotton TRQs.

---

[115] John Fry, *Industry & Trade Summary: Cotton*, USITC publication 3391, January 2001, p. 38.

[116] George Reeves, David Vincent, Derek Quirke, and Stephen Wyatt, *Trade Distortions and Cotton Markets: Implications for Australian Cotton Producers*, Cotton Research and Development Corporation, Canberra ACT Australia, April 2001.

Table 4-11
Cotton: Selected economic effects of TRQ removal, 1999

Sector	Employment		Output		Imports		Exports		Composite price[3]
	FTE[1]	*Percent*	*Value[2]*	*Percent*	*Value[2]*	*Percent*	*Value[2]*	*Percent*	*Percent*
Liberalized sector:									
Cotton farming	-83	-0.2	-11.7	-0.2	10.3	5.2	-1.0	-0.1	-0.1
Downstream sector:									
Textile manufacturing	97	(5)	8.9	(5)	-2.4	(5)	1.4	(5)	(5)
Rest of economy:									
Agriculture	0	(5)	0.4	(5)	-0.0	(5)	0.1	(5)	(5)
Forestry, Fisheries	0	(5)	0.1	(5)	-0.0	(5)	0.0	(5)	(5)
Construction	0	(5)	-0.0	(5)	(4)	(4)	(4)	(4)	(5)
Processed foods	0	(5)	0.7	(5)	-0.1	(5)	0.1	(5)	(5)
Durable manufacturing	10	(5)	3.6	(5)	-1.2	(5)	0.9	(5)	(5)
Nondurable manufacturing	0	(5)	-0.2	(5)	-0.3	(5)	-0.0	(5)	(5)
Finance, insurance, and real estate	-10	(5)	0.1	(5)	-0.0	(5)	0.0	(5)	(5)
Mining	-0	(5)	0.1	(5)	-0.1	(5)	0.0	(5)	(5)
Other services	-10	(5)	0.2	(5)	-0.0	(5)	0.0	(5)	(5)
Transportation, communications, and utilities	0	(5)	0.8	(5)	-0.1	(5)	0.1	(5)	(5)
Wholesale and retail	0	(5)	0.4	(5)	(4)	(4)	(4)	(4)	(5)

[1] Full-time equivalents.
[2] In millions of dollars in base year prices.
[3] Price of the composite good (i.e., imports and domestic production).
[4] Not applicable.
[5] Less than 0.05 percent in absolute value.

Note.—The Commission conducted sensitivity analysis of the effects to crucial economic parameters and the results are discussed in the "The Effects of Liberalization" section.

Source: USITC estimates.

The simulation results presented in table 4-11 are sensitive to the response of imports and exports to relative price changes (see Appendix D). The response of imports and exports to relative price changes are determined by transformation and substitution elasticities between domestic and exported or imported varieties of the same good. There is substantial uncertainty regarding the size of those elasticities. If trade in a commodity does not change much when relative prices change substantially, the elasticities are small. One would expect that estimates of those elasticities would be large for quite homogeneous commodities (e.g., butter or sugar). Yet, empirical estimates of elasticities are relatively small.[117] The simulation results in table 4-11 are based on elasticities that are relatively small (see Appendix D).

Consequently, the Commission conducted sensitivity analysis to examine the implications of liberalization in the cotton market under larger trade elasticities. In the first case, the Commission assumes that U.S. exports are perfect substitutes with domestically used commodities. The implications of trade liberalization are similar to those presented in table 4-11; exports of cotton, however, increase by 0.01 percent.[118] In the second case, the first assumption is held and it is assumed that the elasticity of substitution between imported and domestic cotton is higher than that in the base case presented in table 4-11 (i.e., in the second case the Armington elasticity is set at 5). The implications of trade liberalization are the following: U.S. cotton farming would decline by 0.46 percent; U.S. imports of cotton would increase by 11.6 percent; U.S. exports of cotton would increase by 0.01 percent; the composite price of cotton in the United States would decline by 0.12 percent; and the net economic welfare impact is a gain of $3 million.

Tobacco and Tobacco Products

The United States is a leading world producer, consumer, and trader of tobacco and tobacco products, with U.S. leaf tobacco and cigarettes generally regarded as among the highest quality products worldwide. U.S. production of unmanufactured tobacco,[119] primarily flue-cured and burley, totaled $2.4 billion, 8 percent of world production[120] in 1999 (table 4-12). Exports

[117] For recent estimates of Armington elasticities and a discussion of the issues, see Michael P. Gallaway, Christine A. McDaniel, and Sandra A. Rivera, "Industry-level estimates of U.S. Armington elasticities," USITC, Office of Economics Working Paper No. 2000-09-A, September 2000, found at Internet address *ftp://ftp.usitc.gov/pub/reports/studies/ec200009a.pdf*, retrieved Dec. 31, 2001.

[118] This result is intuitively appealing: trade liberalization causes U.S. cotton prices to decline and thus U.S. exports become more competitive in world markets.

[119] Unmanufactured tobacco is an intermediate product that has undergone processing including curing, de-stemming, and redrying.

[120] USITC estimates using data from USDA, FAS, *Tobacco: World Markets and Trade*, October 1998.

Table 4-12
Tobacco: Summary data, 1997-99

Item	1997	1998	1999
Production *(million dollars)*:			
Unmanufactured tobacco	3,129	3,447	2,370
Cigarettes	28,258	31,814	38,484
Employment *(FTEs)*:			
Unmanufactured tobacco	5,085	([1])	([1])
Cigarettes	21,302	([1])	([1])
Imports *(million dollars)*:			
Unmanufactured tobacco	1,089	771	711
Cigarettes	39	54	106
Exports *(million dollars)*:			
Unmanufactured tobacco	1,553	1,449	1,294
Cigarettes	4,409	4,166	3,231

[1] Not available.

Source: USDOC, Annual Survey of Manufactures, 1999: Value of Product Shipments, March 2001, p. 18; USDOC, 1997 Economic Census, Manufacturing-Industry Series: "Tobacco Stemming and Redrying," Sept. 2, 1999, and "Cigarette Manufacturing," June 16, 1999; and USITC Dataweb.

totaling $1.3 billion and representing 43 percent of U.S. production were shipped primarily to the EU and Japan.[121] A TRQ is applied to certain categories of U.S. tobacco imports used in the production of cigarettes consumed in the United States, mainly semiprocessed flue-cured and burley leaf tobacco.[122] Imported tobacco is generally blended with U.S. leaf to manufacture cigarettes; tobacco subject to the TRQ is used in higher proportions in lower-quality discount cigarettes. Imports of leaf totaled $711 million in 1999, consisting of three basic categories of tobacco. These included flue-cured and burley tobacco subject to the TRQ ($280 million),

[121] The EU and Japan account for approximately 68 percent of U.S. exports of unmanufactured tobacco. Calculated by USITC staff using data from USDA ERS found at Internet address *http://www.ers.usda.gov/Briefing/tobacco/Data/table9.pdf*, retrieved Oct. 1, 2001.

[122] Generally, more than 90 percent of tobacco imported under the TRQ is classified in HTS subheading 2401.20.85, threshed or similarly processed tobacco. Other categories of tobacco and tobacco products subject to the TRQ include: 2401.10.63 unmanufactured tobacco (whether or not threshed or similarly processed), tobacco refuse, not stemmed or stripped; 2401.20.33 not stemmed or threshed partly or wholly stemmed/stripped; 2401.30.33 tobacco stems not cut, ground, or pulverized; 2401.30.35 stems cut, ground or pulverized; 2401.30.37 other includes cut, ground, and pulverized; 2403.10.60 manufactured and manufactured tobacco substitutes, reconstituted tobacco, tobacco extracts and essences; 2403.91.45 homogenized and reconstituted tobacco; 2403.99.60 extracts and essences.

oriental (Turkish) type tobacco ($249 million),[123] and other tobacco[124] including cigar wrapper and filler tobaccos ($182 million).

U.S. cigarette production totaled 606 billion pieces in 1999, representing a 16-percent drop in output during the 1997-99 period, while the value of production rose by 36 percent, to $38 billion, as manufacturers raised prices to recoup losses incurred by the 1998 "Master Settlement Agreement" resolving lawsuits with state governments. U.S. exports of cigarettes, totaling $3.2 billion in 1999, declined by 27 percent during 1997-99, as U.S. manufacturers increased investment and production in foreign markets, particularly in Europe and Asia.

U.S. demand for cigarettes has dropped steadily over the last two decades as a result of increased health awareness, smoking restrictions, and steadily rising prices.[125] During the 1996-1999 period, U.S. per capita consumption of cigarettes fell by 14 percent,[126] as increased state and Federal taxes and manufacturer price increases continued to put upward pressure on prices.

Production of tobacco in the United States is restricted by an annual marketing (production) quota set by the USDA. The quota is based on domestic cigarette manufacturers' purchasing intentions, expected export demand, and stock levels. Under this program, approved by grower (quota-holder) referendum, a no-net-cost fee is assessed for each pound of tobacco marketed that funds a stabilization or price support program managed by the USDA's CCC and grower cooperatives.[127] Tobacco lots that do not receive bids above the support price are guaranteed by a system of non-recourse loans.[128] The tobacco program elevates the price of U.S.

---

[123] Oriental type tobaccos are not subject to the TRQ and are imported duty-free. Oriental leaf, primarily imported from Turkey and from Greece, is a flavoring tobacco blended with flue-cured and burley tobaccos to produce the "American blend" type cigarette.

[124] Includes $25 million of imported cigarette tobacco from Mexico and Canada.

[125] Retail prices for cigarettes increased 44 percent from December 1997 to December 1999 (base month = December 1997). Producer prices rose 194 percent during the same period, while the producer price index measured from the base year 1982 through 1999 increased 432 percent. U.S. Department of Labor, Bureau of Labor Statistics, CPI (series Id: CUUR0000SEGA01) and PPI (series Id: WPU152101) for "cigarettes," found at Internet address *http://www.bls.gov*, retrieved, Oct. 10, 2001.

[126] USITC estimate that uses per capita consumption data from USDA, ERS, "Tobacco Situation and Outlook," April 2001, p. 5.

[127] Referendums are held every 3 years by farmers of certain tobacco types, e.g., flue-cured and burley. For flue-cured growers, see "Flue Cured Tobacco Cooperative, Who We Are," found at Internet address *http://www.ustobaccofarmer.com/whowwearepage.html*, retrieved Oct. 16, 2001. The no-net-cost fee assessment is 5 cents for flue-cured and 2 cents for burley. The assessment is split equally between growers and buyers.

[128] For details on the tobacco program, see Jasper Womach, *Tobacco Price Support: An Overview of the Program*, Congressional Research Service, Report to Congress, May 7, 2001.

tobacco leaf higher than world levels and makes imported tobacco more competitive in the U.S. market, despite the superior U.S. leaf quality.[129]

Beginning in 1999, the marketing of flue-cured tobacco shifted from an auction process to direct contract marketing, whereby tobacco growers enter into production contracts with cigarette manufacturers and leaf dealers for specific types and grades of tobacco. Tobacco marketed under this system is not assessed grading, auction, and warehouse fees, but is still subject to the marketing quota and no-net-cost stabilization assessments. According to industry representatives, nearly 80 percent of the flue-cured tobacco was produced under direct contract during 2001.[130] Burley tobacco production also is beginning to be produced under the direct contracting system. The implications of direct contracting on the marketing quota and price support stabilization program have yet to be determined.[131]

Declining U.S. cigarette consumption resulted in substantial reductions of the U.S. tobacco marketing quota during the 1997-99 period, with the basic quota for flue-cured falling by 31 percent; and the basic marketing quota for burley declining by 36 percent.[132] U.S. demand for imported tobacco similarly declined by 42 percent during the period. In addition, tobacco producing countries such as Brazil, Zimbabwe, and Malawi are increasing quality and production levels of flue-cured and burley tobacco that are taking market share from higher-cost U.S. leaf in many export markets. This further dampens U.S. leaf production.

Nature of Trade Barriers

The TRQ was established by presidential proclamation effective September 13, 1995, and applies to imports of unmanufactured leaf tobacco and manufactured tobacco used in the production of cigarettes destined for domestic consumption, mainly flue-cured and burley.[133] TRQ allotments were negotiated with supplier countries based on production levels and market share and specify the maximum quantity that may be imported during the quota-year, September 13 through September 12 the following year. The TRQ was required

[129] Prices for U.S.-produced flue-cured and burley average about $1/kg higher than the highest quality leaf produced in other countries.

[130] U.S. industry representative, USITC staff telephone interview, Oct. 23, 2001.

[131] Direct contracting is almost exclusively used in Brazil and other leading tobacco countries, except for Zimbabwe and Malawi where tobacco is auctioned at centralized auction centers.

[132] USITC estimate using data on flue-cured and burley tobacco marketing quota from the USDA, ERS, "Tobacco Situation and Outlook," April 2001, p. 17. The basic quotas stabilized during 2001, at a level slightly higher than the 2000 levels.

[133] The proclamation also abolished duties on oriental, cigar binder and filler tobacco.

in order to replace a WTO-inconsistent domestic content rule.[134] Country allocations for QY 1999 are provided in table 4-13. The U.S. Customs Service tracks the quantity of imports from the countries of origin on a first-come, first-served basis. Other than the country-by-country allotments, no quota import rights or licenses are issued to exporters or importers of tobacco.

Table 4-13
Tobacco: TRQ in-quota quantities allocated and imports, metric tons, 1999

Country	Allocation	Actual imports
Argentina	11,000	10,289
Brazil	80,200	43,331
Chile	2,750	0
EU	10,000	4,388
Guatemala	9,625	3,040
Malawi	12,000	8,016
Philippines	3,000	142
Thailand	7,000	6,664
Zimbabwe	12,000	2,352
Other countries or areas	3,000	3,000
Total	150,575	81,222

Source: U.S. Customs Service.

The total 1999 TRQ quantity of 150,575 metric tons (mt) is divided into 10 specific allocations including nine country/trading group allotments, and a residual allocation of 3,000 mt (2 percent) for all other countries. Brazil is the dominant quota holder, accounting for over 80,200 mt, or 53 percent, while other leading producers Zimbabwe and Malawi are each provided 12,000 mt.

In-quota duties for unmanufactured tobacco (HTS heading 2401), the bulk of tobacco subject to the TRQ, ranged from 24.6 cents per kg to $1.01 per kg in 1999, with most in-quota tobacco (HTS subheading 2401.20.85) entering the United States subject to a duty of 38.6 cents per kg (10 percent ad valorem equivalent).[135] All over-quota imports are subject to a 350-percent ad valorem duty, though a drawback program exists for all imports (in-quota and over-quota) which are re-exported either as unmanufactured tobacco or in cigarettes.[136] Canada, Mexico, and Israel are not subject to the quantitative restrictions set forth in the TRQ, pursuant to trade agreements.

[134] U.S. imports of unmanufactured leaf tobacco increased dramatically in the early 1990s, rising over 150 percent during the 1990-92 period. In response to the rise in tobacco imports, an amendment to the Omnibus Budget Reconciliation Act of 1993 was attached by Senator Ford of Kentucky, requiring all domestically produced cigarettes to contain at least 75 percent domestically produced tobacco whether the products were for domestic consumption or export. When the URAA was adopted, this rule was ruled inconsistent with the agreement, which led to the establishment of the TRQ in 1995.

[135] USITC calculations using statistics from the USITC Dataweb.

[136] Under the previous domestic content regime, domestic producers were assessed penalties for imported leaf content in excess of 25 percent, whether the cigarettes were consumed domestically or exported.

Restrictiveness of Trade Barriers

The TRQ on tobacco is not restrictive for most leading world exporters, primarily because the in-quota quantities allocated to tobacco exporting countries were negotiated and set at high levels, based on a period of unusually high imports from 1992 though 1993, when U.S. imports of tobacco totaled more than $1 billion. The rise of imported tobacco during that period was fueled by strong U.S. demand for discount cigarettes with a higher proportion of lower-cost imported leaf.[137] In 1993, discount cigarettes accounted for 37 percent of the U.S. cigarette market; since then, consumption of discount cigarettes has fallen to 27 percent, as consumers appear to be shifting demand to premium branded products principally composed of domestic tobacco and as overall cigarette consumption falls.[138]

Quota levels were not binding for 7 of the 10 country allocation holders in 1999 (table 4-14). Brazil has not filled its quota since the implementation of the TRQ. In 1999, Brazil filled only 54 percent of its allocation. Other leading suppliers include Zimbabwe, at 20 percent, and Malawi, at 67 percent. These two countries also failed to fill their allocations. However, Argentina filled 96 percent of its allocation and Thailand filled 94 percent of its allocation. But it is unlikely that substantial additional tobacco would be imported from these suppliers if they were provided higher quota allocations, given declining U.S. domestic demand and decreasing volumes of U.S. cigarette exports.[139]

Table 4-14
Tobacco: TRQ percentage fill rates, quota years, 1998-2000[1]

Country/quota-year	1998	1999	2000
Argentina	76.1	93.5	92.4
Brazil	56.9	54.0	60.2
Chile	0	0	0
EU	42.1	43.9	45.8
Guatemala	22.0	30.4	24.4
Malawi	52.3	66.8	76.7
Philippines	1.6	4.8	20.5
Thailand	51.9	95.2	82.9
Zimbabwe	38.6	19.6	34.1
Other countries	100.0	100.0	100.0

[1] The QY runs from Sept. 13 through Sept. 12 of the following year (e.g., 1998 refers to Sept. 13, 1997 through Sept. 12, 1998). Percentage fill rates provided in USITC, *Import Restraints, Second Update,* Publication 3201, p. 74, are provided on base years different from those in this table.
Source: U.S. Customs Service.

[137] Discount cigarettes average about 20 percent imported leaf, compared to premium brand cigarettes that may contain as much as 10 percent, while certain brands such as industry standard "Marlboro" may contain only imported oriental leaf.

[138] In the 1997-2000 period, the share of discount cigarettes averaged slightly more than 25 percent. See USDA, ERS, "Tobacco Situation and Outlook," April 2001, p. 5; see also John C. Maxwell, "Shrinking Market," *Tobacco Reporter*, October 2000, p. 18.

[139] U.S. industry representative, telephone interview by USITC staff, Oct. 18, 2001.

The TRQ regime appears to be more restrictive for countries that were not provided quantity allocations when the TRQ was established in 1995. The residual or "other countries" allocation usually fills soon after the beginning of the QY on September 13. China and India and other tobacco exporting countries may be restrained from exporting more leaf to the United States. However, the relatively low quality of filler-type tobacco that these countries currently produce is not directly competitive with producers that have allocations, so little excess demand is restrained by the TRQ.

Previous Work

In 1999, Commission staff did not assess the impact of the TRQs on tobacco and tobacco products because the total quota level for tobacco TRQs was not filled in 1996 and fell well below what could be considered the binding range, i.e., 71 percent. On an individual country basis, Argentina, Malawi, Thailand, Chile and certain other countries filled their allocations in 1996. The share of the total quota quantity allocated to these countries amounted to 24 percent. Thus, it was determined that there was a likelihood that the restricted import supply from these countries could have had some effect on overall import prices in 1996. An ad valorem tariff equivalent, however, was not computed because the price-gap method does not capture price differentials that result from quality differences, which represents a significant factor in determining tobacco prices.

The Effects of Liberalization

As discussed, the TRQ on unmanufactured tobacco is not restrictive for most leading world exporters, but in this section, the Commission examines the impacts of removing the in-quota tariff rate for unmanufactured tobacco and the tariff rate for cigarettes, which is relatively large.[140] The CGE model estimates show that the overall effect of trade liberalization is an economic welfare gain of $5 million to the U.S. economy. Contributing to the gain in economic welfare is that real prices of unmanufactured tobacco and cigarettes fall as a result of liberalization. In particular, the model estimates show that the price of unmanufactured tobacco declines by 0.84 percent and the price of cigarettes declines by 0.03 percent (table 4-15). Table 4-15 presents the model estimates of employment, output, trade, and price effects of unrestricted imports in the U.S. unmanufactured tobacco and cigarette markets.

The upstream tobacco farm sector declines by about 0.7 percent in output and employment, which translates to a decline of $14 million in output and a loss of 103 FTE jobs.[141] Employment and output were estimated to decline by

[140] The cigarette sector is identified as a high-tariff sector in chapter 6. However, because of strong linkages between cigarettes and the tobacco sector, the cigarette sector liberalization is included with the tobacco and tobacco products analysis.

[141] The small estimated impact on the tobacco farm sector is not surprising given the long-run nature of the CGE model used, the fact that the over-quota tariff is not restricting U.S. imports of tobacco, and that the marketing (production) quota for tobacco is based on expected tobacco market conditions.

Table 4-15
Tobacco: Selected economic effects of TRQ removal, 1999

Sector	Employment		Output		Imports		Exports		Composite price[3]
	FTE[1]	Percent	Value[2]	Percent	Value[2]	Percent	Value[2]	Percent	Percent
Liberalized sectors:									
Tobacco	-110	-2.8	-66.6	-2.81	55.5	12.4	-12.2	-0.9	-0.8
Cigarettes	-20	-0.1	-32.9	-0.1	27.7	23.5	-2.4	-0.1	(5)
Downstream sector:									
Other tobacco products	0	(5)	6.7	(5)	-0.5	-0.2	0.6	0.1	-0.1
Upstream sector:									
Tobacco farming	-100	-0.7	-13.6	-0.7	-2.1	-0.7	-0.4	-0.7	(5)
Rest of economy:									
Rest of agriculture	20	(5)	3.9	(5)	-0.8	(5)	1.8	(5)	(5)
Forestry, Fisheries	10	(5)	1.0	(5)	-0.4	(5)	0.2	(5)	(5)
Construction	10	(5)	0.1	(5)	(4)	(4)	(4)	(4)	(5)
Processed foods	10	(5)	2.6	(5)	-1.4	(5)	0.6	(5)	(5)
Durable manufacturing	370	(5)	91.4	(5)	-35.6	(5)	22.3	(5)	(5)
Nondurable manufacturing	110	(5)	20.3	(5)	-8.7	(5)	4.0	(5)	(5)
Finance, insurance, and real estate	10	(5)	2.7	(5)	-0.8	(5)	0.8	(5)	(5)
Mining	10	(5)	4.4	(5)	-2.2	(5)	0.2	(5)	(5)
Other services	-90	(5)	-11.9	(5)	-1.8	(5)	1.1	(5)	(5)
Transportation, communications, and utilities	60	(5)	10.1	(5)	-6.1	(5)	3.4	(5)	(5)
Wholesale and retail	50	(5)	1.2	(5)	(4)	(4)	(4)	(4)	(5)

[1] Full-time equivalents.
[2] In millions of dollars in base year prices.
[3] Price of the composite good (i.e., imports and domestic production) faced by consumers.
[4] Not applicable or nontraded good.
[5] Less than 0.05 percent change in absolute value.

Note.—The Commission conducted sensitivity analysis of the effects to crucial economic parameters and the results are discussed in the "The Effects of Liberalization" section.

Source: USITC estimates.

2.8 percent in the unmanufactured tobacco sector, which translates to a loss of 114 FTE jobs and $66.6 million in output. Imports of unmanufactured tobacco increase by 12.4 percent. The employment, output, and imports impacts for cigarettes are substantially smaller than those for unmanufactured tobacco because imports of cigarettes account for a substantially smaller portion of the U.S. market than unmanufactured tobacco does.

Output and employment in the rest of the U.S. economy expand as resources leave tobacco farming and tobacco manufacturing to be employed in other sectors. The model estimates that overall employment in the U.S. economy grows by 320 FTE jobs as a result of removing the U.S. tobacco TRQs.

The simulation results presented in table 4-15 are sensitive to the response of imports and exports to relative price changes (see appendix D), as was discussed in the sections on dairy, sugar, and cotton. As was the case with these products, the simulation results for tobacco, which are presented in table 4-15, are based on relatively small elasticities of substitution and transformation between domestic and imported or exported varieties of the same product.

As was the case with other commodities analyzed in this report, the Commission conducted sensitivity analysis to examine the implications of liberalization in the tobacco and cigarettes markets using larger trade elasticities. In the first case, the Commission assumed that U.S. exports are perfect substitutes with domestically used commodities. For this case, the implications of trade liberalization are similar to those presented in table 4-15. U.S. exports of unmanufactured tobacco and cigarettes, however, increase by small amounts. In the second case, the first assumption is held and it is assumed that the elasticity of substitution between imported and domestic unmanufactured tobacco and cigarettes is higher than that in the base case presented in table 4-15 (the relevant Armington elasticities are set at 5). The implications of trade liberalization are the following: U.S. imports of unmanufactured tobacco increase by 41 percent and imports of cigarettes increase by 42 percent. The composite price of unmanufactured tobacco declines by 0.83 percent and the composite price of cigarettes declines by 0.03 percent.

Ethyl Alcohol

Ethyl alcohol for fuel use, commonly known as ethanol, is a clear, colorless, liquid fuel produced from a variety of potential feedstocks, including sugarcane, corn, sorghum, and others.[142] In the United States, the majority of

[142] For the purposes of this study, ethyl alcohol and ethanol will be used interchangeably.

the ethanol produced is derived from corn.[143] Ethanol has a higher octane rating than gasoline and can be mixed with gasoline to reduce the level of hydrocarbon created by fuel combustion in gasoline engines.

Production capacity in the United States in 1999 totaled approximately 2 billion gallons, of which 74 percent was utilized.[144] In total, the U.S. ethanol industry employed 1,268 production workers in 1999 (table 4-16). The United States is a net importer of ethanol and did not export any ethanol during the 1997-99 period. In terms of 1999 world production, the United States ranked second, behind Brazil, capturing 21 percent of world production. In that same year, Brazil accounted for a 42 percent share of world production.[145]

Table 4-16
Ethyl alcohol for fuel use: Summary data, 1997-99

Item	1997	1998	1999
Shipments *(million dollars)*:			
Ethyl alcohol, fuel use, dry milling[1]	458	397	422
Ethyl alcohol, fuel use, wet milling[2]	1,123	973	1,033
Employment *(FTEs)*:[3]			
Ethyl alcohol manufacturing	1,037	1,093	1,268
Imports *(million dollars)*:			
Ethyl alcohol, fuel use (nonsynthetic)[4]	22	26	42
Exports *(million dollars)*	0	0	0

[1] Corresponds to NAICS classification code 32519303.
[2] Corresponds to NAICS classification code 32519301.
[3] Includes employment of production workers in all denatured ethyl alcohol production facilities.
[4] HTS subheadings for ethyl alcohol for fuel use are 2207.10.60 and 2207.20.00. The imports in the table do not reflect imports of synthetic ethyl alcohol, which also enters under those two subheadings.

Sources: USDOC, U.S. Census Bureau, *Statistics for Industry Groups and Industries, Annual Survey of Manufactures, 1999*, May 2001; USDOC, U.S. Census Bureau, *Value of Product Shipments, Annual Survey of Manufactures, 1999*, March 2001; U.S. Customs, Quota Branch, weekly postings at electronic bulletin board; LMC International, Ltd., *LMC Commodity Bulletin, Ethanol Prices*, October 2001.

Nature of Trade Barriers

The trade barriers for ethanol stem from both the domestic and trade policies for ethanol. In fact, trade policy is used to counteract the benefits derived from the application of the domestic policy, as explained in the next section.

[143] There are two different processes used in the United States to produce ethanol from corn: dry corn milling and wet corn milling. Corresponding North American Industry Classification System (NAICS) codes for the dry and wet milling production of fuel-grade ethanol are 32519303 and 32519301, respectively (See Office of Management and Budget, NAICS, 1997).

[144] "Ethanol: Clean Air, Clean Water, Clean Fuel," *Industry Outlook 2001*, Annual publication, Renewable Fuels Association, Washington, DC, 2001.

[145] "World Ethanol Production, 2001," *International Molasses and Alcohol Report*, July 31, 2001, F.O. Licht, Kent, England.

U.S. domestic ethanol policy

In the United States, a federal excise tax of 18.4 cents per gallon is assessed on motor fuels. A partial exemption from the federal excise tax on motor fuels is provided for ethanol that is derived from renewable resources and used as fuel. Ethyl alcohol that is derived from petroleum, natural gas, or coal is not eligible for the tax exemption. The value of the tax exemption depends on the quantity and type of ethanol blended in a gallon of fuel. In 1999, the tax exemption was 54 cents per gallon of ethanol. Thus, gasoline blended with 10 percent ethanol would receive a tax exemption equal to 5.4 cents per gallon. The tax exemption has been deemed an implicit subsidy for ethanol production in the United States,[146] although some domestic producers of ethanol have stated that it is just a differential tax, meaning that ethanol is simply assessed a lower tax rate.[147] Fuel distributors that blend ethanol with gasoline can earn an income tax credit as well. A distributor cannot file for both the partial tax exemption and the income tax credit, however. Generally, the blenders tend to select the partial tax exemption.[148] U.S. distributors of gasoline blended with ethanol receive the partial tax exemption whether or not the ethanol is produced domestically or imported, so a trade barrier exists to ensure that the United States is not subsidizing foreign production of ethanol.

U.S. trade ethanol policy

The United States administers three trade policy tools for imports of ethyl alcohol for fuel use: tariffs, a TRQ, and an additional excise tax for imports outside of the TRQ that essentially operates as a prohibitive over-quota tariff rate.

Tariffs.—Tariffs applied to ethyl alcohol for fuel use are found in chapter 22 of the HTS. The product enters under HTS subheading 2207.10.60 or 2207.20.00. The column 1-general rate of duty is the NTR rate of duty applied to countries with NTR status.[149] The column 1-special rate of duty applies to those eligible countries with NTR status that can receive preference under a free-trade agreement such as NAFTA or under a preferential trading arrangement such as the Andean Trade Preference Act (ATPA) or the CBERA. Preferential duty-free access under HTS subheadings 2207.10.60 and 2207.20.00 is offered to countries with Generalized System of Preference (GSP) status; Canada; African Growth and Opportunity Act countries;

[146]GAO, "Tax Incentives for Petroleum and Ethanol Fuels," Sept. 25, 2000.

[147] Ethanol industry representative, USITC staff interview, Sioux Falls, SD, Oct. 18, 2001.

[148] GAO, "Tax Incentives for Petroleum and Ethanol Fuels," Sept. 25, 2000.

[149] Ethyl alcohol has an import tariff of 2.5 percent.

CBERA countries; Israel; and ATPA countries. Mexico receives a preferential rate of 0.6 percent for exports to the United States under HTS subheading 2207.20.00.

Tariff-rate quota.—CBERA countries receive duty-free access to the U.S. market for only a fixed quantity of imports, that is, an effective TRQ. In-quota imports from CBERA countries enter free of duty; the over-quota imports are assessed a tariff rate of 2.5 percent ad valorem under HTS subheading 2207.10.60 and 1.9 percent for HTS subheading 2207.20.00. Duty free TRQs do not apply to non-CBERA countries, which means that non-CBERA imports are dutiable as well as subject to an additional excise tax on imports.

The Commission determines the TRQ amount for CBERA countries annually under section 7 of the Steel Trade Liberalization Program Implementation Act of 1989.[150] Section 7 of the Steel Act concerns local feedstock requirements for fuel-ethyl alcohol imported into the United States from CBERA countries.[151] The TRQ quantity is the maximum amount of ethyl alcohol allowed with a zero-percent local feedstock ratio from CBERA countries at the in-quota, duty-free tariff rate. Beyond the TRQ level, more stringent feedstock requirements are placed on imports from CBERA countries. For imports beyond the TRQ, the feedstock requirements are 30 percent for the first 35 million gallons that enter after the TRQ, and 50 percent for volumes higher than the TRQ, plus 35 million gallons. The Act requires the USITC to make an annual determination of U.S. domestic consumption of ethyl alcohol and then to determine the TRQ or the "base quantity of imports" for CBERA countries. The TRQ is the greater of 60 million gallons or 7 percent of domestic consumption. The USITC determined U.S. domestic consumption for 1998 to be 1.34 billion gallons; thus, the TRQ quantity was set at 94.1 million gallons (7 percent of 1.34 billion gallons) for 1999.[152]

Additional excise tax on imports.—An additional excise tax is assessed on ethyl alcohol imports from non-CBERA countries and over-quota imports from CBERA countries.[153] The additional tax of 14.27 cents per liter applies to all imports except TRQ imports from CBERA countries, Canada, Israel, and Mexico.[154] The additional excise tax on imports equals 54 cents per gallon, which is the precise level of the partial federal excise tax exemption offered for ethanol that is derived from renewable resources and used as fuel. The level of the excise tax on imports exactly offsets the domestic federal tax exemption to ensure against subsidizing foreign production of ethanol.

[150] 19 U.S.C. 2703.

[151] Local feedstock means hydrous ethyl alcohol which is wholly produced or manufactured in any U.S. insular possession or designated beneficiary country.

[152] The TRQ was set at 80.3 million gallons in 1998 and 79.7 million gallons in 1997.

[153] This additional duty is found in chapter 99, subchapter 1 of the HTS. The applicable tariff subheading for the extra duty is 9901.00.50.

[154] National Import Specialist, U.S. Customs Service, USITC staff telephone interview, July 16, 2001. Consult the Tax Reform Act of 1986 for more information.

CBERA countries are exempt from paying the additional excise tax on TRQ imports, and so are implicitly subsidized on the production of their ethanol. The TRQ permits imports of CBERA ethanol with a zero-percent feedstock ratio, so it is possible for these countries to import hydrous ethyl alcohol from a third country, process it into anhydrous ethyl alcohol, and export the final product to the United States. Thus, almost the entire product could be derived from a non-CBERA country.

Restrictiveness of Trade Barriers

The tariffs on ethanol are quite low and therefore not restrictive. However, the application of the TRQ solely for CBERA countries, coupled with the assessment of the additional 14.27-cent-per-liter excise tax on imports for non-CBERA countries, is restrictive for non-CBERA exports. The entire trade policy system mirrors a country-specific TRQ regime whereby the excise tax on imports operates as a prohibitive over-quota tariff that discourages imports of ethanol beyond the TRQ. The TRQ appears not to have been restrictive for CBERA countries, because the fill rates were quite low from 1997 through 1999, averaging about 39 percent over the period.

The Effects of Liberalization

Ethyl alcohol is imported from CBERA countries into the United States free of duty. Those imports are substantially below the quota for CBERA countries, which implies that it is not economical for producers in CBERA countries to export more to the U.S. market. Thus, removal of the quota on CBERA imports would not have an impact on real U.S. imports and domestic prices.[155] The border measure for ethyl alcohol imports into the United States from other, non-CBERA countries is 57.4 percent and there are no imports from those countries.[156] Removal of that border measure would result in imports to the United States, and some of those imports could displace CBERA imports or U.S. production. An assessment of these impacts should include domestic economic policies, such as the fuel excise tax exception given to U.S. producers of ethyl alcohol. Removal of border measures on U.S. imports of ethyl alcohol implies removal of the fuel excise tax exception for U.S. producers of ethyl alcohol. Under such a policy change, U.S. production and imports of ethyl alcohol might drop dramatically.

[155] The Commission annually reports the impact of CBERA preferences. In its 1997 report, the Commission found that CBERA preferences cause U.S. production of ethyl alcohol to decline between 0.03 and 1.29 percent. See table 3-5 in USITC, *Report on the Impact on the United States of the Caribbean Basin Economic Recovery Act, Thirteenth Report 1997*, publication 3132, Sept. 1998.

[156] Ethyl alcohol has an import tariff of 2.5 percent, plus an excise tax of 14.27 cents per liter.

Canned Tuna

Canned tuna is one of the most valuable seafoods in the U.S. market, with U.S. production in 1999 reaching $946 million and imports totaling $458 million (table 4-17). Most U.S. production takes place in American Samoa, where two large canneries account for almost all U.S. production. Minor production occurs in a small cannery in southern California and another in Puerto Rico. Three companies produce U.S. canned tuna: U.S.-owned StarKist and Bumble Bee and foreign-owned Chicken of the Sea.[157]

Table 4-17
Canned tuna: Summary data, 1997-99

Item	1997	1998	1999
Production *(million dollars)*	918.7	983.0	945.8
Employment[1] *(1,000 FTEs)*	10.5	11.4	11.6
Imports *(million dollars)*	345.5	389.2	458.5
Exports *(million dollars)*	15.0	11.5	5.8

[1] Commission estimate.

Source: USDOC official statistics, except as noted.

The United States is the world's largest tuna producer and the largest importer. Imports, which come mainly from low-cost sources, such as Thailand, account for about one-third of U.S. apparent consumption. Exports account for about 1 percent of domestic production.

This sector has two principal products: canned tuna packed in oil and canned tuna packed in water. Production costs are nearly identical; producers can switch production within a cannery from one product to the other at small cost. Wholesale and retail prices of the two products also are identical. About 13 percent of U.S. production is tuna packed in oil and 87 percent is packed in water. About 99 percent of imported tuna is packed in water.

Nature of Trade Barriers

Tuna packed in oil is subject to a simple tariff of 35 percent ad valorem. However, tuna packed in water is subject to a TRQ with a two-tiered tariff of 6 percent when the aggregate quantity imported does not exceed 20 percent of the "U.S. pack" (production) in the preceding year, and 12.5 percent when this quota is exceeded.

The quota of 20 percent of the preceding year's domestic pack is allocated on a global first-come, first-served basis. The U.S. pack on which it is based

[157] StarKist, with 44 percent of U.S. sales in 1999, is a subsidiary of H.J. Heinz Co., of Pennsylvania. Bumble Bee, with 23 percent of U.S. sales, is a subsidiary of ConAgra Foods, of Nebraska. Van Camp, maker of Chicken of the Sea brand tuna, with 17 percent of U.S. sales, is a subsidiary of Thai Union, a large tuna producer in Thailand. The market percentages indicated include the firms' imports as well as domestic production. The remaining market share includes imports by other firms.

does not include production in American Samoa. As a result, the reported domestic pack is very small and the resulting quota is filled quickly, usually within the first month.[158] There have been no significant administrative changes in this TRQ in many years.

The TRQ reportedly creates significant costs to importers and to U.S. Customs beyond the added duty.[159] Because the quota is generally filled within one month and the tariff gap is 6.5 percent, importers stockpile large quantities of canned tuna in U.S. Customs bonded warehouses in late December, to be released once the new calendar year begins. Industry sources report that this creates a substantial burden for them beyond the cost of the over-quota duty.[160] An additional burden for both the industry and U.S. Customs is the fact that the reported U.S. production on which they base the quota is not available for several months into the new year. Thus, U.S. Customs typically must estimate the quota it begins to administer each January. This may result in either over- or under-charged duties, if the estimate is under or over the actual production reported later in the year. Industry sources report delays of as much as a year in receiving refunds for overcharged duties on canned tuna.

Restrictiveness of Trade Barriers

As noted, the tuna TRQ is allocated globally and has generally filled quite rapidly each year for several years. In 1999, of total imports subject to the TRQ, 23 percent entered under quota and 77 percent entered over quota.

The Effects of Liberalization

The impacts of the TRQ on canned tuna is estimated by simulating removal of the TRQ on water-packed tuna and the 35 percent tariff on oil-packed tuna. Total imports of water-packed tuna exceed the quota; thus, the over-quota tariff of 12.5 percent is assumed to be the relevant tariff rate for this analysis.

Commission estimates, using the COMPAS model, suggest that removal of the two trade policies discussed here would cause imports of canned tuna to increase by 10.2 percent (see table 4-18); oil-packed tuna imports would increase by about 33 percent and imports of water-packed tuna would increase by about 10 percent.[161] As a result of increased imports, real prices of canned tuna would drop 3.6 percent. As a result of lower domestic prices, the volume of domestic sales of U.S. produced canned tuna would decline by about 1.6 percent. The net welfare impact of removing the canned tuna border measures is a gain of $1.6 million.

---

[158] See testimony of Christopher Lischewski, President, Bumble Bee Seafoods, before the USITC, transcript of hearing, Dec. 4, 2001, p. 113.

[159] Ibid, 133-134. See also, questions by Commissioner Hillman, 165-166; Commissioner Miller, p. 194; and Vice Chairman Okun, p. 208.

[160] Including U.S. tuna canners, who are among the largest importers.

[161] See appendix D for a discussion of the COMPAS model.

Table 4-18
Canned tuna: Selected economic effects of TRQ removal, 1999

Item	Estimate
Change in composite price *(percent)*	-3.6
Output change:	
Value *(million dollars)*	-33.2
Volume *(percent)*	-1.6
Imports change:	
Value *(million dollars)*	12.0
Volume *(percent)*	10.2
Welfare *(million dollars)*	1.6

Source: USITC estimates.

Beef

The analysis in this sector applies to fresh, chilled, or frozen beef that falls under Standard Industrial Classification (SIC) 2011.[162] The United States is the world's largest-volume beef producer, with production exceeding 26.7 billion pounds in 1999. The United States was the leading-volume importer of beef during the 1997-99 period and the second largest-volume exporter (table 4-19).[163] Imports accounted for 11 percent of total U.S. beef consumption in 1999, up from 9 percent in 1997.

Table 4-19
Beef: Summary data, 1997-99

Item	1997	1998	1999
Shipments *(million dollars)*	24,243	23,634	27,333
Employment *(1,000 FTEs)*	73	71	72
Imports *(million dollars)*	1,406	1,607	1,896
Australia	354	465	504
New Zealand	328	328	334
Total from countries with quota allocations	797	877	968
Exports *(million dollars)*	2,433	2,251	2,597

Note.–U.S. imports include those applicable to the tariff-rate quota and include imports from Canada and Mexico. See Chapter 2, Additional U.S. Note 3, *Harmonized Tariff Schedule of the United States, 1999.*

Source: U.S. beef shipments estimated by the USITC using Federally inspected livestock slaughter, average dressed weight, and wholesale beef prices statistics of USDA. See USDA, National Agricultural Statistics Service, *Livestock Slaughter*, Annual Summaries and USDA, ERS, *Agricultural Outlook*, Sept. 2000, and June-July 2001. Employment data for beef industry estimated by the USITC based on the share of meat production accounted for by beef times total meat packing production workers, as reported by the American Meat Institute, *Meat & Poultry 2000 Facts*, p. 32.

[162] This sector also includes veal.

[163] USDA, FAS, *Livestock, and Poultry: World Markets and Trade,* Beef and Veal Summary Tables, found at Internet address *http://www.fas.usda.gov/dlp/circular/2002/02-03LP/toc.htm*, retrieved October 3, 2001.

Most U.S.-produced and -exported beef is derived from grain-fed cattle, much of which is used for table beef and typically grade Choice.[164] By comparison, the bulk of U.S. imports of fresh, chilled, or frozen beef is derived from grass-fed animals.[165] The imported beef is generally leaner than U.S. grain-fed beef and consists primarily of frozen, boneless beef used in manufacturing food products such as beef patties.[166] Imported lean beef is often mixed with higher fat content meat trimmings from domestic grain-fed animals[167] to produce manufactured hamburger meat for fast food retail outlets. Import interests contend that such imports rarely compete with U.S. grain-fed beef.[168] Meat and Livestock Australia contends that much of the Australian beef exported to the United States is used by the food service sector in fast food chains and that such imported beef complements U.S. grain-fed beef.[169]

Nature of Trade Barriers

Since the implementation of the URAA on Jan. 1, 1995, U.S. imports of most fresh, chilled, or frozen beef became subject to TRQs. The United States agreed to an annual TRQ of 656,621 metric tons (1.5 billion pounds) product weight, and an additional 20,000 metric tons each from Uruguay and Argentina when those countries were found by the U.S. Secretary of Agriculture to be free of Foot-and-Mouth (FMD) and Rinderpest diseases.[170] The TRQ has country-specific quota quantities allocated to Australia, New Zealand, Japan,

[164] Table beef is beef that is a final good, ready for cooking and consumption without further processing. U.S. consumption of table beef is primarily sourced from domestically raised cattle. The USDA grading system for live cattle and carcasses of beef consist of two components—quality grading and yield grading. The official U.S. quality grades for cattle and beef carcasses are Prime, Choice, Select, Standard, Commercial, Utility, Cutter, and Canner. These quality grades represent the various degrees of marbling and firmness of a given carcass, as well as the maturity of the carcass.

[165] An exception would be U.S. imports of Canadian beef, which are typically derived from grain-fed animals.

[166] Prehearing brief of New Zealand Meat Producers Board, Mar. 10, 1997, p. 4, and cited in USITC, *Cattle and Beef: Impact of the NAFTA and Uruguay Round Agreements on U.S. Trade*, publication 3048, investigation No. 332-371, July 1997, p. 2-14.

[167] USITC, Industry & Trade Summary, *Live Cattle and Fresh, Chilled, or frozen Beef and Veal*, publication 2625, April 1993, 14-15.

[168] Prehearing brief of New Zealand Meat Producers Board, Mar. 10, 1997, p. 4, and cited in USITC, *Cattle and Beef: Impact of the NAFTA and Uruguay Round Agreements on U.S. Trade*, publication 3048, investigation No. 332-371, July 1997, p. 2-14.

[169] Meat and Livestock Australia Ltd. is a private, non-profit corporation that represents the interests of Australian beef and sheepmeat industries. See Meat and Livestock Australia, *US as a beef market*, found at Internet address *http://www.mla.com*, retrieved Oct. 3, 2001.

[170] Uruguay was found to be free of the diseases in mid-November 1995, as was Argentina in 1997. See 60 *FR* 55440 (Nov. 1, 1995) and 62 *FR* 34385 (June 26, 1997).

Uruguay, and Argentina, as shown in table 4-20.[171] Imports from Mexico and Canada are not subject to this TRQ.

The in-quota tariffs on U.S. beef imports are relatively low at 2.5 percent ad valorem in 1999. U.S. imports of fresh, chilled, or frozen beef are subject to TRQs and the over-quota rates are relatively high at 27.2 percent ad valorem in 1999.[172]

Table 4-20
Beef: TRQ In-quota quantities allocated by countries and TRQ percentage fill rates, 1997-99

Country	Quantity		Fill rates		
	Metric tons	1,000 pounds	1997	1998	1999
			Percent		
Canada	([1])	([1])	([2])	([2])	([2])
Mexico	([1])	([1])	([2])	([2])	([2])
Australia	378,214	833,819	56	75	76
New Zealand	213,402	470,471	90	93	87
Japan	200	441	4	5	8
Uruguay	20,000	44,092	99	67	99
Argentina	20,000	44,092	27	36	100
All other	64,805	142,871	48	27	32
Total	696,621	1,535,786	75	75	77

[1] No limit.
[2] Not applicable.

Source: For in-quota allocations see Chapter 2, Additional U.S. Note-3, *Harmonized Tariff Schedule of the United States,* 2001, p. 2-1. To convert metric tons to 1,000 pounds multiply by 2.204622. Percent quota filled derived by taking actual imports as reported by USDOC and dividing into quota allocations.

[171] U.S. imports of beef are also subject to nontariff measures. The Federal Meat Inspection Act generally only allows U.S. imports of beef from countries that enforce inspection and other requirements that are at least equal to those applied at U.S. Federally inspected establishments. Also, most U.S. imports of fresh, chilled, or frozen meat, including beef, are limited to countries that the U.S. Secretary of Agriculture has found to be free of FMD and Rinderpest diseases. In addition, the USDA restricts cattle and cattle products, including beef imports, from countries where Bovine Spongiform Encephalopathy (BSE, referred to as Mad Cow Disease) is known to exist, as well as from countries that apply less restrictive import measures than those applied in the United States and/or because the regions have inadequate surveillance programs. See 21 U.S.C. 661 and 21 U.S.C. 620.

[172] See Additional U.S. Note (#3), ch. 2, HTS. The aggregate quantity of beef entered under HTS subheadings 0201.10.10, 0201.20.10, 0201.20.30, 0201.20.50, 0201.30.10, 0201.30.30, 0201.30.50, 0202.10.10, 0202.20.10, 0202.20.30, 0202.20.50, 0202.30.10, 0202.30.30, and 0202.30.50 is subject to TRQs.

Restrictiveness of Trade Barriers

Some industry interests contend that the over-quota rates of duty are high enough to make import costs prohibitive.[173] In contrast, the total TRQ has not been filled since its implementation in 1995.

Overall, the quota fill rate was 1.2 billion pounds, representing about 77 percent of the 1.5 billion pounds maximum TRQ quantity in 1999. Argentina and Uruguay essentially filled their country quota allocations in 1999; nevertheless, such imports combined only accounted for 6 percent of the total TRQ. U.S. imports of fresh, chilled, or frozen beef from Argentina and Uruguay subsequently were prohibited because of an Argentinian outbreak of foot and mouth disease in August 2000 and an Uruguayan outbreak in April 2001.[174] The prohibitions remain in effect.

Among the largest-volume suppliers, New Zealand filled 87 percent of its quota in 1999 and Australia filled 76 percent of its quota. In recent years, the increase in beef exports from Australia and New Zealand primarily reflects the relative strength of the U.S. dollar on international exchange markets. Meat and Livestock Australia Ltd. reports that the low relative value of the Australian dollar resulted in increased beef exports to the United States in 1999.[175] Australian beef exports compete on a price basis with U.S. domestic lean beef. The depreciation of the Australian dollar during the past 18 months from US$0.65 (AU$1.04)[176] to US$0.51 (AU$0.97) has effectively lowered Australian beef prices by 22 percent in U.S. dollar terms.[177] New Zealand faced similar prices given the relative strength of the U.S. dollar. In addition, it is reported that some U.S. importers that would normally source beef imports from Argentina and Uruguay are now looking to import Australian or beef because of the FMD outbreaks in those South American countries.[178]

---

[173] Meat and Livestock Australia Ltd. and the Meat Importers Council of America contend that the over-quota rates are trade prohibitive. See USITC, *Cattle and Beef: Impact of the NAFTA and Uruguay Round Agreements on U.S. Trade*, publication 3048, investigation No. 332-371, July 1997, p. 6-3.

[174] The prohibition of Argentine fresh, chilled, or frozen beef into the United States began in August 2000 and lasted until early January 2001. Additional outbreaks were reported in mid-March 2001 and the prohibition was reinstated. See USDA, FAS, *GAIN Report* AR1049, Aug. 3, 2001. For the Uruguayan prohibition, see USDA, Animal and Plant Health Inspection Service, *Foot and Mouth Disease, Uruguay, Short Report*, Apr. 26, 2001, and USDA, APHIS, press release, *USDA Prohibits Beef from Argentina*, June 1, 2001.

[175] This statement also is true for 2000. See Meat and Livestock Australia Ltd., *US as a beef market*, found at Internet address *http://www.mla.com*, retrieved Oct. 3, 2001.

[176] February 2000 exchange rate: 1 Australian dollar was worth 62.8 U.S. cents. August 2001 exchange rate: 1 Australian dollar was worth 52.5 U.S. cents. Found at Internet address *http://www.federalreserve.gov/releases/H10/Hist*, retrieved Nov. 27, 2001.

[177] "Bullish prices for beef and lamb set to stay," Sept. 4, 2001, found at Internet address *http://www.pestgenie.com.au/news*, retrieved Oct. 3, 2001.

[178] Meat and Livestock Australia Ltd., *US as a beef market*, found at Internet address *http://www.mla.com,* retrieved Oct. 3, 2001.

U.S. beef imports from Australia and New Zealand are significantly influenced by rainfall and resulting pasture conditions in these two countries. In periods of drought, pastures are inadequate and cattle herd size may be reduced by increasing slaughtering rates, thereby resulting in higher beef production and exports. When rainfall increases, animals may be kept from slaughter to build up herd numbers, resulting in reduced beef production and exports in the short run.[179]

As stated earlier, the bulk of U.S. beef imports are derived from grass-fed animals supplied principally by Australia and New Zealand, and as such are not close substitutes for U.S. grain-fed beef production. Grain-fed Canadian beef, however, accounted for about 38 percent of U.S. beef imports in 1999. There is no limit to the quantities that may enter from Canada and Mexico subject to in-quota rates of duty; therefore, such imports likely would not be affected if the TRQ were eliminated.

Previous Work

In 1999, Commission staff did not assess the impact of the meat TRQs. Only 58 percent of the total quota level for meat TRQs was filled in 1996, well below the binding range. Uruguay was the only country to fill its allocation, but Uruguay accounted for only 3 percent of the total quota quantity. Thus, the Commission determined that the elimination of the TRQs in 1996 would not have had a significant effect on the overall price of meat imports subject to the TRQs.

The Effects of Liberalization

The total quota quantity for beef under TRQs was not filled in 1999 and fell below what could be considered a binding range (table 4-20). Argentina and Uruguay were the only countries to fill or come close to filling their allocations of 20,000 metric tons each (table 4-20). However, the determination of the quota level for Argentina and Uruguay was based on health considerations (i.e., foot and mouth disease). Consequently, it is unlikely that the elimination of the TRQs in 1999 would have had a significant effect on the overall real price of beef imports subject to the TRQs. Similarly, the effects on U.S. net welfare, domestic output, imports, and exports would be small or negligible, had the TRQs been eliminated.[180]

Olives

The olives covered in this study include five HTS provisions, one of which is olives provisionally preserved in a state unsuitable for immediate

[179] USITC, Industry & Trade Summary, *Live Cattle and Fresh, Chilled, or Frozen Beef and Veal*, publication 2625, April 1993, p. 15.

[180] The effects of tariff liberalization for this sector were not considered because the in-quota tariff was not significant, as defined in chapter 1.

consumption. The other four provisions cover olives prepared or preserved otherwise than by vinegar or acetic acid and not frozen. The United States is a small- to moderate-size global producer of processed olives, a position of less importance than a decade or two ago. The decline in the number of U.S. canneries, in part because of increasing imports of comparable products, has resulted in less domestic production and a greater reliance on imports. U.S. production fluctuates on about a 3-year cycle and production during the later part of the 1990s was close to production levels in previous periods (table 4-21).

Table 4-21
Olives: Summary data, 1997-99

Item	1997	1998	1999
Production *(million dollars)*[1]	66.4	41.1	56.3
Employment *(1,000 FTEs)*	([2])	([2])	([2])
Imports *(million dollars)*[3]	8.2	7.3	7.7
Exports *(million dollars)*[4]	7.7	7.4	7.1

[1] Data are the estimated values at the grower level of olives utilized for all forms of processing (including but not restricted to those comparable items imported for consumption), as opposed to an estimated value of production for finished goods, which is more comparable but not available.

[2] Not available.

[3] Data include HTS subheadings 0711.20.18, 2005.70.02, 2005.70.06, 2005.70.16, and 2005.70.91.

[4] Data include Schedule B Nos. 0711.20.0000 and 2005.70.0000.

Note.–The export subheadings included here cover all processed olives, not simply those items covered in the import schedule. There are a number of other processed olive subheadings not covered by a TRQ and, therefore, not included here. Thus, import and export data may not be directly comparable.

Source: Production data compiled by the USITC from *Noncitrus Fruits and Nuts 2000 Preliminary Summary*, USDA, National Agricultural Statistics Service, FR Nt 1-3 (01)a, January 2001, pp. 22-23; and *Fruit and Tree Nuts Situation and Outlook Yearbook*, USDA, ERS, FTS-287, October 1999, p. 28; exports and imports compiled by the USITC from USDOC official statistics.

In recent years, overall import quantities are believed to have accounted for 10-20 percent of overall consumption, with the import share of consumption much greater for certain styles of canned olives. The United States is not a significant exporter of canned olives.

Nature of Trade Barriers

The TRQs on olives, negotiated under the URAA, specify the maximum import amounts allowable from all countries under a lower tariff, without country-by-country allocations or the need for quota import rights or licenses. Imports of these products are not subject to any further restrictions apart from ordinary U.S. Customs Service requirements.

Imports of provisionally-preserved, not-pitted, green olives, packed in a saline solution in containers each holding more than 8 kilograms (drained

weight)[181] and certified by the importer to be used for re-packing or sale as green olives (HTS subheading 0711.20.18) are grouped together for quota purposes with olives, prepared or preserved otherwise than by vinegar or acetic acid and not frozen, in a saline solution, green in color, not pitted, other than ripe, and packed in containers each holding more than 8 kilograms and certified by the importer to be used for re-packing or sale as green olives (HTS subheading 2005.70.06), with the aggregate quantity of olives entered under these two subheadings together not exceeding 4,400 metric tons in any calendar year. Imports of green olives prepared or preserved in a saline solution, not pitted, ripe, and packed in containers each holding less than 13 kilograms under HTS subheading 2005.70.02, are covered in an aggregate quantity not to exceed 730 metric tons entered in any calendar year. Imports of green olives prepared or preserved in a saline solution, place packed, and stuffed, in containers each holding no more than 1 kilogram under HTS subheading 2005.70.16, are covered in an aggregate quantity not to exceed 2,700 metric tons entered in any calendar year. Imports of green olives prepared or preserved but not in a saline solution, and packed in containers each holding less than 13 kilograms under HTS subheading 2005.70.91, are covered in an aggregate quantity not to exceed 550 metric tons entered in any calendar year.[182]

Restrictiveness of Barriers

The existing TRQs on certain canned olives are not believed to be import restrictive. The quantities allocated under quota are generally two to three times larger than quantities actually entered and have seldom if ever been filled. Also, the difference in tariff rates between under- and over-quota amounts is not significant.

The Effects of Liberalization

The total quota level for olives TRQs was not filled in 1999, falling well below what could be considered a binding range. Consequently, it is unlikely that elimination of the TRQs in 1999 would have a significant effect on the overall real price of those olive imports. Similarly, the effects on U.S. net welfare, domestic output, imports, and exports are likely to be small or negligible, had the TRQs been eliminated.[183]

[181] Drained weight is the actual weight of the contents of the container after all packing solutions have been removed from the container. All references to container weights will be assumed to be drained weights.

[182] The within-quota and over-quota duty rates for the olives covered here are as follows: HTS 0711.20.18, 3.7 cents/kg; HTS 0711.20.28, 6.2 cents /kg.; HTS 2005.70.02, 5.4 cents/kg; HTS 2005.70.04, 4.3 cents/kg.; HTS 2005.70.06, 3.7 cents/kg. and 4.3 cents/kg; HTS 2005.70.16, 5.4 cents/kg; HTS 2005.70.18, 7.6 cents/kg.; HTS 2005.70.91, 5.5 cents/kg; and HTS 2005.70.93, 9.2 cents/kg.

[183] The effects of tariff liberalization for this sector were not considered because the in-quota tariff, as defined in chapter 1, was not significant.

Section 201 Border Measures

Wheat Gluten

Wheat gluten is a byproduct of flour milling that is used to provide the binding properties needed in baking and a variety of other food applications. About 80 percent of wheat gluten is used in baking, with the remainder used in the pet food industry. The U.S. wheat gluten industry consists of 4 producers, with 128 production workers and total industry shipments of $99.4 million for the MY 1999 (see table 4-22).[184] U.S. shipments rose steadily from 1997 to 1999, increasing almost 40 percent during this period. Total domestic consumption of wheat gluten in 1999 was 364.8 million pounds, with a value of $224 million.[185] In MY 1999, the U.S. industry had a market share of 44.4 percent, with the remainder coming from imports.[186] U.S. imports in calendar year 1999 were valued at $91.1 million, an increase of 38 percent since 1997 (table 4-22). The United States is not a major exporter of wheat gluten, with total exports valued at $9 million in 1999.

Table 4-22
Wheat gluten: Summary data, Marketing years 1997-99

Item	1997	1998	1999
Shipments[1] *(thousand dollars)*	71,152	82,376	99,361
Employment[1]	129	129	128
Imports *(thousand dollars)*	66,008	97,914	91,149
Exports *(thousand dollars)*	6,068	9,443	9,027

[1] Data given on a MY basis as the year ending on June 30 of the years indicated. For example, MY 1999 began on July 1, 1998 and ended on June 30, 1999.

Sources: USITC, *Wheat Gluten,* Investigation No. TA-204-2, Publication 3258, December 1999, table C-1; and USDOC official statistics.

Nature of Trade Barriers

Beginning on June 1, 1998, certain imports of wheat gluten were subject to a quantitative restriction in the form of an absolute quota. Prior to the quota, imports of wheat gluten for animal feeds were assessed a tariff of 2.9 percent in 1997 and 2.5 percent in 1998. For all other wheat gluten applications, the tariff was 7.4 percent in 1997 and 7.2 percent in 1998. In September 1997, the Commission initiated an investigation, on behalf of the Wheat Gluten Industry Council, under the Trade Act of 1974 (19 U.S.C. 2252) to determine whether increased imports of wheat gluten were a substantial cause of serious injury or

[184] The MY 1999 represents the year beginning on July 1, 1998 and ending on June 30, 1999.

[185] USITC, *Wheat Gluten,* Investigation No. TA-204-2, Publication 3258, December 1999, table C-1.

[186] Ibid.

threat of serious injury to the U.S. industry.[187] In January 1998, the Commission unanimously determined that increased imports of wheat gluten were a substantial cause of serious injury to the U.S. industry producing wheat gluten.

On May 30, 1998, the President imposed a quota on certain wheat gluten imports through Presidential Proclamation 7103, which begun on June 1, 1998. The quota was allocated on a country-specific basis for a duration of 3 years plus 1 day. The allocation of the quota was based on the average import shares that were in place between the MY ending June 30, 1993 and the marketing year ending June 30, 1995. The quota was allocated among the EU, Australia, and an "all other countries" category. Imports from countries subject to NAFTA and GSP treatment were excluded from the quota. The initial quota was set at 57.6 million kg and was to increase by 6 percent per year over the 3-year period. No imports over the quota are allowed, with any excess imports assessed against the following year's quota quantity.[188]

Restrictiveness of Trade Barriers

In the 1998 quota year (QY),[189] the worldwide quota was set at 57.6 million kg. It was allocated to Australia (28.3 million kg), the EU (24.5 million kg), and all other countries (4.7 million kg). The quota was scheduled to increase by 6 percent in the next two quota years. In the first quota year, however, the EU exceeded its quota by 5.4 million kg and Australia exceeded its quota by 27,000 kg. Importers and brokers apparently failed to identify wheat gluten as subject to the quota on U.S. customs forms, thereby resulting in the overage.[190] In response, the EU quota for QY 1999 was reduced by the overage amount, from 26.0 million kg to 20.6 million kg.[191] No reductions were made in the QY 1999 quota share for Australia. The QY 2000 quota allocation for the EU remained unchanged at 27.5 million kg.

---

[187] For more information on the Wheat Gluten Section 201 investigation, see USITC, *Wheat Gluten* Investigation No. TA-201-67, Publication 3088, March 1998; USITC, *Wheat Gluten* Investigation No. TA-204-2, Publication 3258, December 1999; and USITC, *Wheat Gluten: Extension of Action,* Investigation No. TA-204-4, Publication 3407, April 2001.

[188] On June 1, 2001 the President authorized $40 million in assistance to the industry for 2 years to complete its transition to competitiveness. This assistance was provided in lieu of extending the safeguard, thus imports are no longer subject to a quota.

[189] The quota year begins on June 1 and ends on May 31. For example, QY 1998 began on June 1, 1998 and ended on May 31, 1999.

[190] Ed Maixner, "Wheat gluten pours through Clinton quota," *Feedstuffs*, Apr. 12, 1999, p. 4.

[191] On May 28, 1999, the quota was amended to resolve the overage of wheat gluten imports from the EU that entered in the quota year 1998. Under Presidential Proclamation 7202, the EU allocation for QY 1999 was reduced by the volume of the overage in QY 1998. On May 26, 2000, the quota was amended through Presidential Proclamation 7314. The allotment for QY 2000 was allocated on a quarterly basis and Poland was placed in the "all other countries" category, instead of being exempt under the GSP as a result of a significant rise in wheat gluten imports.

In 1999, the quota was binding for both the EU and Australia (table 4-23). The quota for "all other countries" was not filled, however, because most countries in this category are not major producers of wheat gluten. U.S. imports of wheat gluten from Poland increased markedly during the 1997-99 period, from no imports in 1997 to $5.8 million in 1999, but were not subject to the quota during the first 2 years as a result of Poland's exclusion as a developing country under GSP. Poland was made subject to the quota in the third quota year, however. U.S. imports of wheat gluten also increased from Canada, which was not subject to the quota. In addition, allegations were made that foreign producers circumvented the quota by mixing wheat gluten with other products, which were classified under an HTS subheading not identified in the scope of the quota restriction. The industry has alleged that a 90/10 pre-mix product, consisting of 90 percent wheat gluten and 10 percent soybean meal, has been entering the United States as an animal feed product under HS 2309.90.10.50 rather than under the wheat gluten quota, despite this product having the same visco-elastic properties as wheat gluten.[192]

Table 4-23
Wheat gluten: Quota allocation and fill rate, quarter year 1998 and 1999[1]

Item		1998	1999
Australia	Quota Level *(thousand kg)*	28,315	30,014
	Fill Rate *(percent)*	100.1	100.4
European Union	Quota Level *(thousand kg)*	24,513	[2]20,581
	Fill Rate *(percent)*	126.0	100.7
All other countries	Quota Level *(thousand kg)*	4,693	4,975
	Fill Rate *(percent)*	40.3	63.1

[1] The QY begins on June 1 and ends on May 31. For example, QY 1998 began on June 1, 1998 and ended on May 31, 1999.

[2] Figures represent reduced quota level as a result of overage in previous quota year. Original quota level for QY 1999 was 25,983 thousand kg.

Sources: USITC, *Wheat Gluten: Extension of Action*, Publication 3407, April 2001, table II-3, and USDOC official statistics.

Because the quota is restrictive, it was filled rapidly in each of the first 2 years. For instance, the QY 1999 quota allocation for the EU was filled in 17 days. The rapid filling of the quota resulted in a surplus of gluten in the U.S. market shortly after the quota opened, causing prices to fall and disrupting the market. This was a factor behind the industry's request for a quarterly allocation of the quota in the third quota year.[193]

[192] USITC, *Wheat Gluten,* Publication 3258, December 1999, II-4 and II-8.

[193] *Milling and Baking News*, "President modifies wheat gluten import quotas; limits for Poland," June 6, 2000, p. 1, and *Inside U.S. Trade*, "Interagency Group Likely to Alter Wheat Gluten Quota," Apr. 26, 2000.

The Effects of Liberalization

In 1998, in connection with its recommendation to the President to impose import relief in the form of a quota, the Commission estimated the effects of its recommended quota on wheat gluten.[194] The quota proclaimed by the President was substantially the same as that recommended by the Commission.[195] For the current report, the Commission based its analysis of removing the quota on the original 1998 Commission estimates of the effects that imposition of a quota would have. Applying that analysis in reverse, the "removal" (absence) of the quota likely would have reduced real domestic wheat gluten prices by 3.1 percent to 7.7 percent from 1997 levels. Domestic sales of U.S. production would have declined by 12.3 percent to 16.5 percent; the overall real prices of wheat gluten in the U.S. market would have declined by 5.6 percent to 11.8 percent; and the overall U.S. expenditures on wheat gluten would have declined by $10.0 million to $22.8 million.

Lamb Meat

The analysis in this sector applies to fresh, chilled, or frozen lamb meat (SIC code 2011).[196] Table 4-24 contains summary data on shipments, employment, imports, and exports in the U.S. lamb-packing industry during the 1997-99 period. Shipments were valued at $423 million in 1999, while the sector provided approximately 800 full-time jobs.[197] U.S. fresh, chilled, or frozen lamb meat imports totaled $161 million in 1999, while exports were valued at $6 million.

Table 4-24
Lamb meat: Summary data, 1997-99

Item	1997	1998	1999
Shipments *(million dollars)*	462	373	423
Employment[1] *(FTEs)*	720	804	803
Imports *(million dollars)*	123	141	161
Exports[2] *(million dollars)*	6	7	6

[1] Average number of production and related workers employed by lamb meat packers.
[2] May include U.S. exports of fresh, chilled, or frozen mutton bone-in cuts and boneless mutton as these items are not separately provided for in *Schedule B*. See *Statistical Classification of Domestic and Foreign Commodities Exported from the United States: 1996 Edition Schedule B*.

Source: U.S. lamb shipment as reported in USITC, *Shifts in U.S. Merchandise Trade 2000*, Publication July 2001, p. C-3.

[194] USITC, *Wheat Gluten: Views of the Commission on Injury,* Publication 3088, March 1998, found at Internet address *ftp://ftp.usitc.gov/pub/reports/opinions/PUB3088.PDF,* retrieved Dec. 31, 2001.

[195] The principal difference is that the Commission recommended that the quota be imposed for a 4-year period, whereas the President imposed a quota for a period of 3 years and 1 day.

[196] Includes HTS subheadings 0204.10.00, 0204.22.20, 0204.23.20, 0204.30.00, 0204.42.20, and 0204.43.20.

[197] Reflects the average number of production and related workers employed by lamb meat packers; but does not include live lamb producers. USITC, *Lamb Meat,* Investigation No. TA-204-3, Publication 3389, January 2001, p. IV-12.

U.S. lamb meat shipments declined from 246 million pounds in 1997 to 241 million pounds in 1999.[198] However, U.S. lamb meat consumption increased from 307 million pounds in 1997 to 325 million pounds in 1999. Imports accounted for 26 percent of total U.S. lamb meat consumption in 1999, up from 20 percent in 1997. Australia and New Zealand account for virtually all U.S. lamb meat imports.

Domestic and imported lamb meat are frequently differentiated on the basis of three characteristics: (1) domestic lamb carcasses and the cuts derived from them are typically larger than imported carcasses and cuts; (2) domestic lamb meat is typically derived from animals that have been grain fed, whereas imported lamb meat is derived from animals that have been grass fed; and (3) domestic lamb meat is generally sold fresh or chilled, whereas imported lamb meat is often sold frozen. However, the volume of imported fresh, chilled lamb meat has increased since 1997. In 1999, it accounted for 54 percent of the lamb meat entering into the United States.

Nature of Trade Barriers

On July 7, 1999, following a unanimous USITC affirmative determination of threat of serious injury under section 201 of the Trade Act of 1974, the President imposed a TRQ on imports of fresh, chilled, or frozen lamb meat.[199] The President further directed the Administration to develop an effective assistance package to help the domestic sheep industry to make a positive adjustment to import competition.[200] Consequently, in January 2000, the U.S. Secretary of Agriculture announced a 3-year, $100 million assistance package for sheep and lamb farmers.[201]

The TRQ was applied to lamb meat imports from Australia, New Zealand, and all other countries except Canada, Mexico, Israel, and beneficiary countries under the CBERA and the ATPA. Except for Australia and New Zealand, as noted previously, these countries have accounted for a minor share of U.S. lamb meat imports. The safeguard TRQ provisions are set forth in HTS subheadings 9903.02.01 through 9903.02.06.

The safeguard applies to goods exported on or after July 22, 1999, and runs for a period of 3 years and 1 day. The in-quota tariff rate is 9 percent ad valorem for year 1 of the TRQ, 6 percent for year 2, and 3 percent for year 3. The rate of duty for over-quota imports is 40 percent ad valorem for year 1, decreasing to 32 and 24 percent, respectively, over the next 2 years. These rates are in lieu of the 1999 general rate of duty of 0.8 cent per kilogram.

---

[198] U.S. lamb meat shipments estimated by the staff of the USITC, using lamb slaughter and average carcass weight statistics of USDA, adjusted for changes in stocks. USITC, *Lamb Meat*, Publication 3389, January 2001, p. IV-6.

[199] *64 FR 37389*, Presidential Proclamation 7208, July 9, 1999.

[200] "*Action Under Section 203 of the Trade Act of 1974 Concerning Lamb Meat*," 64 *FR* 37393 July 12, 1999.

[201] USDA News Release, *Glickman Announces $100 Million Assistance Package for Sheep and Lamb Farmers*, Jan. 13, 2000.

The in-quota quantity in year 1 was 31,851,151 kg (70.2 million pounds), to be increased by 857,342 kg (1.9 million pounds) annually in the second and third years of relief. Individual country allocations were established for Australia and New Zealand, and an "other countries" category was established within the TRQ.

Table 4-25 shows U.S. in-quota import allocations and the percent of in-quota allocated quantities filled by imports from Australia, New Zealand, and other countries during the first year of the quota (July 22, 1999 through July 21, 2000).

Table 4-25
Lamb meat: TRQ in-quota quantities allocated and TRQ percentage fill rates, 1999-2000

Country	Allocations		In-quota quantity filled
	Kilograms	Pounds	
			Percent
Australia	17,139,582	37,786,300	100
New Zealand	14,481,603	31,926,461	93
Other countries	229,966	506,988	10
Total	31,851,151	70,219,748	96

Source: U.S. Customs Service official, telephone interview with USITC staff, Sept. 19, 2000.

The in-quota quantities are tracked through an export certificate program established by the United States Trade Representative and monitored by the U.S. Customs Service. Under the program, only lamb meat imports that have been issued an export certificate may enter at the in-quota duty rate. The Australian and New Zealand Government authorities administer the export certificates for lamb exports to the United States.

In October 1999, Australia and New Zealand filed a WTO challenge to the lamb meat safeguard. In December 2000, the WTO Dispute Settlement Body concluded that the United States failed to show that the safeguard measure was instituted in response to unforseen developments, as required by the GATT rules, and that the USITC failed to ensure in its injury analysis that injury caused by factors other than imports was not attributed to imports, as required by the Safeguards Agreement. The United States appealed this decision; however, the WTO Appellate Body upheld these conclusions and in May 2001 issued a decision finding certain aspects of the safeguard to be inconsistent with WTO rules.[202] The USTR announced it would end its TRQ safeguard on November 15, 2001, and would provide additional financial assistance to the U.S. lamb industry. [203]

[202] WTO, *Report of the Appellate Body: United States-Safeguard measures on imports of fresh, chilled or frozen lamb meat from New Zealand and Australia*, WT/DS177/AB/R, WT/DS178/AB/R, AB-2001-1, May 1, 2001.

[203] USTR, *Bush Administration Settles Lamb Safeguard Issue with Australia & New Zealand*, Aug. 31, 2001, found at Internet address *http://www.ustr.gov*, retrieved Sept. 10, 2001.

Restrictiveness of Trade Barriers

Australia filled its in-quota allocation during the first year of the import relief and New Zealand filled 93 percent of its quota.

The Effects of Liberalization

The estimated impact of the TRQ on lamb meat is simulated by removing the TRQ. Analysis of this TRQ is difficult because the TRQ was implemented in the middle of July 1999, and it is not possible to confirm how much of the $161 million of imports (table 4-26) came into the United States after the implementation of the TRQ. Trade data suggest that the value of U.S. imports of lamb meat for the months of August through December 1999 from all countries totaled $59.1 million.

Table 4-26
Lamb meat: Estimates of selected economic effects of TRQ removal, 1999

Item	1999
Change in composite price *(percent)*	-3.4
Output change:	
Value *(million dollars)*	-12.8
Volume *(percent)*	-1.4
Imports change:	
Value *(million dollars)*	6.9
Volume *(percent)*	12.7
Welfare *(million dollars)*	0.8

Source: USITC estimates.

Results of the COMPAS model suggest that removal of the lamb TRQ would cause the 1999 volume of lamb meat imports to increase by 12.7 percent. As a result of increased imports, the real price of lamb meat would drop 3.4 percent. As a result of lower domestic real prices, the sales volume of U.S. produced lamb meat would decline by about 1.4 percent. The net welfare impact of removing the lamb TRQ is a gain of $800,000.

CHAPTER 5
Services

Introduction

Imports of services into the United States are generally free of trade barriers. Trade restrictions (typically regulatory requirements) exist at the federal, state, and local levels, and are consistent with national treatment obligations under multilateral trade agreements if both domestic and foreign firms or persons face the same degree of restrictiveness. Federal regulations, examined here, include prohibitions or restrictions on domestic market access in certain sectors.

Previous investigations of services industries have identified the maritime transportation sector as a U.S. industry protected by import restraints. Air and truck transport also have restrictions limiting the access of foreign operators in the U.S. market. Within the trucking sector, lack of regulatory and enforcement harmonization between the United States and Mexico remains an important consideration. The original timetable under the NAFTA granting Mexico full cross-border access in trucking services has not been met, largely due to safety concerns about Mexican trucks and drivers operating in the United States.

Other service industries have measures in place that might be considered import restrictions, but the impediments are regulatory barriers not explicitly related to international trade policy. This chapter focuses primarily on the restraints within the transportation sector. It presents a quantitative simulation analysis of the cabotage restrictions within maritime transport. Trucking and air services also are examined; however, no formal quantitative analysis of these industries is presented. Financial, insurance, and banking sectors are heavily regulated industries that include significant international trade flows. These sectors and the relevant regulatory environments are described in the final portion of this chapter.

Maritime Transport

The United States protects U.S. flag vessels and shipbuilders from import competition in the U.S. domestic ocean borne trade, primarily through section 27 of the Merchant Marine Act of 1920, also known as the Jones Act.[1] The

[1] 46 U.S.C. 883, 19 CFR 4.80, and 4.80 (b).

Act requires that the transport of cargo between U.S. ports[2] be provided on vessels that are U.S.-built and -registered, and that are owned and crewed by U.S. citizens.[3] Also, the United States maintains several other cabotage laws that further restrict the participation of foreign vessels in U.S. domestic trades. These laws are designed to ensure the existence of a U.S. merchant fleet that can participate in domestic ocean borne commerce, and can assist in national defense during times of war and national emergency.[4] This report provides a quantitative assessment of the costs of specific Jones Act restrictions on coastwise or deep-sea domestic shipping.[5]

Current Operation of the Jones Act and Other U.S. Cabotage Laws

Aside from the Jones Act, the United States maintains cargo preference laws, which reserve the transport of certain types of U.S. cargo to vessels operating under the U.S. flag. For example, U.S.-flag vessels must transport at least 50 percent of government-owned cargo and all U.S. military cargo.[6]

[2] The transportation of merchandise between U.S. ports, either directly or via a foreign port, is known as cabotage.

[3] While many nations have a variety of cabotage restrictions, very few require the use of domestically built vessels. Most nations maintain cabotage restrictions on inland waterways, rivers, and lakes, for reasons of sovereignty and national security; however, the United States and several other countries also maintain coastal and noncontiguous cabotage restrictions. In a survey conducted by the U.S. Maritime Administration of 56 selected countries, it was reported that 40 countries maintain cabotage provisions with respect to their domestic waterways, and seven other countries restrict, but do not prohibit, the operation of foreign vessels in their domestic markets. U.S. Department of Transportation, Maritime Administration, *By the Capes Around the World: A Summary of World Cabotage Practices*, found at Internet address *http://www.marad.dot.gov/publications/pubs.html*, retrieved Nov. 5, 2001.

[4] The Jones Act does not preclude vessels that have received U.S. Government construction subsidies from the U.S. Government from operating in the U.S. domestic trade. Officials of the U.S. Department of Transportation, Maritime Administration, USITC staff telephone interview by USITC staff, Nov. 14, 2001.

[5] Coastwise or deep-sea domestic shipping refers to the transport of cargo by oceangoing vessels within the following three geographic areas: between the U.S. mainland and Alaska, Hawaii, Puerto Rico, and the U.S. Pacific Islands; along the Atlantic, Gulf, and Pacific Coasts, as well as between these coasts and the St. Lawrence Seaway; and between the Atlantic, Gulf, and Pacific Coasts via the Panama Canal. The inland trades, which include river, canal, and lakewise traffic, are not addressed in this analysis. U.S. Department of Transportation, Maritime Administration, "Domestic Shipping," found at *http://www.marad.dot.gov*, retrieved Aug. 13, 2001.

[6] This restriction is maintained under the Cargo Preference Act of 1954 (Public Law 83-664). In addition, the Food Security Act of 1985 (Public Law 99-198) requires that U.S.-flag vessels transport at least 75 percent of agricultural cargoes that are a part of foreign assistance programs administered by USDA and the U.S. Agency for International Development.

Additionally, freight that is transported in connection with loans provided by the Export-Import Bank also must be carried by U.S.-flagged vessels, unless a waiver is granted by the U.S. Maritime Administration permitting the recipient country of such cargo to transport it on vessels under its own flag.[7] Separately, the 1995 Alaska Power Administration Asset Sale and Termination Act requires that exports of Alaskan crude oil be transported solely by U.S.-flagged and U.S.-owned vessels, though such vessels may be constructed outside of the United States.[8]

The United States maintains several exemptions to the Jones Act and other cabotage laws.[9] These exemptions permit the transport of cargo between specific U.S. ports by certain vessels that do not comply with Jones Act restrictions.[10]

For example, ships that are constructed outside the United States,[11] but are registered under the U.S. flag, are permitted to operate between American Samoa, Guam, Midway, Wake, or Kingman Reef and other U.S. ports.[12] In addition, a foreign-built, foreign-flagged vessel that is salvaged in U.S. waters and subsequently rebuilt in the United States may operate in the U.S. domestic market, provided that the cost of rebuilding it is at least three times its assessed value at the point of salvage.[13] Moreover, a foreign-built, foreign-flagged vessel seized during war by U.S. citizens may subsequently be permitted to operate under the U.S. flag in the domestic maritime market.[14]

---

[7] Public Resolution No. 17. U.S. Department of Transportation, Maritime Administration, *Maritime Subsidies*, September 1993, pp. 162-163.

[8] Public Law 104-58.

[9] Laws similar to the Jones Act limit the ability of foreign vessels to transport passengers and conduct other kinds of marine activity, such as fishing, towing, salvaging, and dredging in U.S. waters. For a more detailed discussion of these laws, see USITC, *Import Restraints: Second Update 1999*, Publication 3201, May 1999.

[10] American Samoa is exempt from the Jones Act, as are the U.S. Virgin Islands (46 App. U.S.C. 877). The Commonwealth of the Northern Mariana Islands is also exempt, with the exception of activities reserved for the U.S. Government (48 U.S.C. 1664; Pub. L. 94-241, Article V). U.S. Department of Transportation, Maritime Administration, *By the capes: A Primer on U.S. Coastwise Laws*, found at *http://www.marad.dot.gov*, retrieved August 13, 2001.

[11] A U.S.-built vessel is one that is assembled entirely in the United States and whose hull and superstructure are made of components manufactured in the United States. With few exceptions, a U.S.-built vessel that has operated under a foreign flag loses its right to provide service in U.S.-domestic trades (46 U.S.C. 883). In addition, a U.S. vessel of at least 500 tons that has been reconstructed in a foreign shipyard is no longer permitted to operate in the U.S. domestic market (46 U.S.C. 883).

[12] Ibid.

[13] 46 U.S.C. 14.

[14] 46 U.S.C. 12106-08 (1904 Act).

Characteristics of the Jones Act Fleet

Three types of vessels are deployed in U.S. domestic (Jones Act) deep-sea trade: dry-cargo carriers, liners, and tankers. Dry-cargo carriers transport bulk freight. Liners, which include container, breakbulk, and roll-on/roll-off vessels, transport manufactured and nonmanufactured goods. Tankers carry petroleum and other liquid cargo.[15] As of July 1999, the Jones Act fleet operating in the U.S. deep-sea trade comprised 182 self-propelled vessels. Of this number, 97 vessels were tankers and 23 were containerships.[16] In 1999, Jones Act vessels carried 229 million short tons of cargo in U.S. coastal waters,[17] accounting for revenues of $1.8 billion (table 5-1).[18] According to the U.S. Army Corps of Engineers, in 1999 the largest share of Jones Act cargo consisted of petroleum and petroleum-based products (70.8 percent), followed by crude materials (7.4 percent), manufactured goods and manufacturing equipment (6.8 percent),

Table 5-1
U.S. domestic cargo sector for vessels 1,000 gross tons and larger: Total revenues and employment, by types, 1995-99

Item	1995	1996	1997	1998	1999
Revenues *(million dollars):*					
Oceanborne	2,774	2,782	2,169	2,115	1,828
Lakewise	585	579	615	612	549
Inland[1]	4,353	4,323	4,117	4,159	4,418
Total	7,712	7,684	6,901	6,886	6,795
Employment *(shipboard jobs):*					
Oceanborne[2]	9,400	8,800	9,242	8,506	9,036
Lakewise	1,935	1,736	1,764	1,635	1,344
Inland	13,725	13,710	([3])	([3])	([3])
Total	25,060	24,246	([3])	([3])	([3])

[1] Includes revenue figures for locks and channels.

[2] For vessels normally employed on longer voyages, one billet (position) may be filled by more than one seaman during a calendar year. The Maritime Administration uses a conversion ratio of 2.3. Therefore, 3,850 billets may provide employment for approximately 8,800 seamen during a calendar year.

[3] Not available.

Source: USDOT, Bureau of Transportation Statistics, *NTS Water Transport Profile 2000*; USDOT, Maritime Administration, "U.S. Merchant Marine Data Sheet," various editions; and Eno Transportation Foundation, Inc., *Transportation in America* (2000).

[15] The McGraw-Hill Companies and USDOC, ITA, *U.S. Industry & Trade Outlook 1999*, "Water Transportation," chap. 43, p. 17.

[16] No self-propelled dry cargo carriers operating in the U.S. coastal trades were recorded by the U.S. Maritime Administration in 1999. U.S. Department of Transportation, Maritime Administration, "Cargo-Carrying U.S.-Flag Fleet by Area of Operation as of July 1, 1999."

[17] U.S. Army Corps of Engineers, *Waterborne Commerce of the United States* (Part 5, National Summaries), Calendar Year 1999, Table 2-1.

[18] Eno Transportation Foundation, Inc., *Transportation in America 2000*, p. 7.

chemicals and related products (6.2 percent), coal (5.7 percent), and food and farm products (3.1 percent).[19]

Both the size of the self-propelled Jones Act fleet and the volume of cargo carried by these vessels have declined in recent years. During the period 1995-99, the number of self-propelled, U.S.-flag vessels decreased by 7 percent,[20] while the volume of cargo carried by such vessels fell by 14 percent.[21] At the same time, as more activity has been transferred to barges and other lower-cost vessels, employment has declined, but not proportionally. Illustratively, employment on vessels in U.S. oceanborne trade decreased by nearly 4 percent during 1995-99 (table 5-1).[22]

The volume of cargo transported in the U.S. deep-sea domestic trade is projected to decrease by an estimated 1.5 percent annually during 1999-2004, based on anticipated reductions in U.S. domestic production and shipment of crude oil.[23] As a result, new tanker construction is expected to decline, leading the capacity of the U.S. tanker fleet to fall by 7 percent on an annual basis during 1999-2004.[24] In addition, the capacity of the dry-cargo vessel fleet is expected to fall by 2 percent annually through 2002, as older ships are retired from service.[25]

Compliance with U.S. Liability and Other Laws and Regulations

Several U.S. laws that exist apart from the Jones Act, including environmental, labor, and tax laws, may significantly increase costs of vessels operating in U.S. waters. For example, regulations enacted in 1994 under the Oil Pollution Act of 1990 (OPA-90) require that all tankers trading in U.S.

---

[19] U.S. Army Corps of Engineers, *Waterborne Commerce of the United States* (Part 5, National Summaries), Calendar Year 1999, table 2-1.

[20] This figure represents privately owned, self-propelled U.S.-flag vessels over 1,000 tons. U.S. Department of Transportation, Maritime Administration, "Privately-owned Vessels with Unrestricted Domestic Trading Privileges: Jones Act Summary 1,000 Gross and Above," provided via electronic correspondence to USITC staff on Mar. 14, 2002.

[21] *U.S. Army Corps of Engineers, Waterborne Commerce of the United States* (part 5, National Summaries), Calendar year 1995, table 2-1, and Calendar year 1999, table 2-1.

[22] U.S. Department of Transportation, Maritime Administration, "U.S. Merchant Marine Data Sheet," provided by U.S. Maritime Administration staff through faxed correspondence, received Sept. 5, 2001.

[23] Crude oil shipments are forecasted to decrease by 11 percent annually. The McGraw-Hill Companies and USDOC, ITA, *U.S. Industry & Trade Outlook 2000*, "Water Transportation," pp. 52-56.

[24] Ibid; and American Shipbuilding Association, "Commercial Shipbuilding and its Relationship to the U.S. Navy Shipbuilding Industrial Base," found at Internet address *http://www.americanshipbuilding.com*, retrieved Aug. 10, 2001.

[25] The McGraw-Hill Companies and USDOC, ITA, *U.S. Industry & Trade Outlook 2000*, "Water Transportation," pp. 52-56.

waters comply with double-hull requirements by 2010,[26] with the result that U.S.- and foreign-flagged tankers engaged in U.S. waters will likely be newer, more costly vessels. In addition, "open-ended" liability for shipowners/operators may further increase costs to those participating in the U.S. market.[27] Although the tanker markets of most developed countries have liability standards that are broadly comparable to those of the United States, and International Maritime Organization (IMO) rules have regularized these standards internationally, only the United States has an open-ended liability structure that may cause some operators to avoid the U.S. market.

Some industry analysts maintain that, in addition to environmental laws, foreign vessels operating in U.S. domestic waters would be required to comply with certain other U.S. regulations, including federal and state tax, immigration, and labor laws.[28] According to industry representatives, foreign vessels' compliance with these laws likely would increase the costs of such vessels operating in the Jones Act trade, thereby substantially decreasing the cost differential between U.S.- and foreign-flag carriers.[29]

However, other industry observers maintain that only some of these laws would apply to foreign vessels if they were allowed to participate in Jones Act

---

[26] By 2010, tankers weighing more than 5,000 tons will not be permitted to operate in U.S. waters unless such vessels have a double bottom or double sides. American Geological Institute, review of National Research Council Report "Double-Hull Tanker Legislation: An Assessment of the Oil Pollution Act of 1990," found at Internet address *http://www.agiweb.org/hearings/nrcopa90.html*, retrieved Sept. 21, 2001.

[27] Under open-ended liability, there is no limit to the amount of damages for which a party can sue a vessel owner. Such damages may be incurred by cargo while in transport or by crew members; or damage can be inflicted on another vessel. These damages are covered under Protection and Indemnity insurance. Other types of insurance that a vessel owner operating in U.S. waters likely would purchase include hull insurance, which covers the costs of damages to one's own vessel, and pollution liability insurance, which covers damages resulting from oil spills or leakage of other pollutants. Maritime industry representative, USITC staff telephone interview, Sept. 24, 2001.

[28] In particular, according to one industry representative, unless granted an exemption, U.S. vessels operating in the Jones Act trade would be required to comply with certain sections of the Immigration and Nationality Act (8 U.S.C. §§ 1101-1503); the Fair Labor Standards Act (29 U.S.C. §§ 201-205); the Occupational Health and Safety Act (29 U.S.C. §§ 651-678); the National Labor Relations Act (29 U.S.C. §§ 151-166); and U.S. federal and state tax laws, minimum wage laws, and vessel safety and environmental regulations. Written information provided to USITC staff during interview with U.S. industry representative, Washington, DC, Oct. 31, 2001.

[29] For example, in a 1998 report by the GAO analysts concluded that certain U.S. federal tax laws likely would apply to foreign vessels operating under the Jones Act, but it was unclear to what degree U.S. minimum wage, immigration, and employee protection laws would apply. GAO, "Maritime Issues: Assessment of the International Trade Commission's 1995 Analysis of the Economic Impact of the Jones Act," presented to The Honorable John McCain, Chairman, Committee on Commerce, Science, and Transportation, United States Senate, Mar. 6, 1998.

trade. Even then, it is not clear to what extent these laws would affect the costs and operation of foreign vessels in the U.S. market.[30]

Cost Differentials: U.S. Coastwise vs. Foreign Trade

Vessel costs primarily comprise capital and operating costs. Capital costs are those associated with value added by the operating firms.[31] Operating costs include wages paid to crews, direct fuel charges, insurance, maintenance and repair, and other administrative expenses. Of these, labor, insurance, and maintenance costs are typically higher in absolute terms for U.S. vessels than for foreign-flag vessels (table 5-2). U.S. crew costs generally account for most of the differences in operating costs between U.S.- and foreign-flag vessels. For example, manning costs[32] account for over 50 percent of the operating cost differential for a typical oil tanker, and nearly 80 percent of the cost differential for a typical containership.[33]

Table 5-2
Comparison of daily operating expenses for U.S.-flag vs. foreign-flag vessels, 1999

	Tanker[1]		Container ship[2]	
Type of vessel	U.S.-flag	Foreign-flag	U.S.-flag	Foreign-flag
	U.S. dollars			
Crew	9,250	2,100	13,350	1,900
Fuel[3]	6,100	3,800	8,400	8,400
Maintenance and repair[4]	5,000	2,200	4,300	2,500
Insurance	2,500	1,400	2,200	1,200
Port call, cargo, and vessel expenses[5]	3,200	2,900	82,550	82,450
Total	26,050	12,400	110,800	96,450

[1] These costs are estimated for an Aframax tanker that is more than 10 years old.
[2] These costs are estimated for a containership with a volume of 2,000 twenty-foot equivalent units (TEUs) that is at least 10 years old.
[3] The U.S.-flag tanker represented has a higher daily fuel cost because it is powered by steam turbine, but this difference would be eliminated if it were diesel powered. Information provided by U.S. Maritime Administration to the Commission, Nov. 5, 2001.
[4] These costs, including costs pertaining to stores, supplies, and equipment.
[5] For containerships, cargo expenses include the costs associated with the loading and unloading of cargo from ships, and inland transportation services.

Source: Information provided by the U.S. Maritime Administration to the Commission, Nov. 5, 2001.

[30] Warren L. Dean, Jr., "Jones Act Reflects Fundamentals of U.S. Legal System," *The Journal of Commerce*, Dec. 1, 1998, p. 5A.

[31] The Commission was unable to secure direct information on the capital costs of U.S.-flag vs. foreign-flag vessels.

[32] Manning costs include wages and benefits paid to shipboard employees.

[33] Information provided by the U.S. Maritime Administration to USITC staff, Nov. 5, 2001.

Previous Work

A few studies have examined the economic cost of the Jones Act as a trade restriction. In 1999 the USITC found that the economic cost of the Jones Act was as much as $1.3 billion for 1996.[34] Other authors found impacts in the same general range using different techniques.[35] Hufbauer and Elliott, for example, estimated a net cost of $1.1 billion.[36] The cost of the maritime restriction is sensitive to the estimated cost components presented in the previous section.

Model Specification

To analyze the maritime transport sector, the USITC's CGE model was modified to include the services of domestic coastwise waterborne transportation. Impacts on important upstream and downstream sectors, including the petroleum refining, crude oil and natural gas extraction, ship building, mining, and manufacturing sectors were analyzed. The model is designed to analyze flexibly the cost components of foreign competition, and to separate capital versus labor cost savings. This design permits analyses of specific restrictions in the Jones Act, and offers insight into the effects of recent proposals to liberalize only certain components of the Act (i.e., the domestic build requirement). The numeric simulations presented here, like the work cited previously, deal only with oceanborne cargo.[37]

The model is designed for relatively transparent comparative static experiments, so it does not provide insights on short- to medium-run dynamic issues. The import penetration and capital effects presented should be interpreted as long-run responses. An additional consideration in the static framework is that equipment investments are not modeled to react optimally to future returns. In other words, to capture long-term change in the demand for shipbuilding, investment in domestic ships for coastal transport is reduced in

[34] USITC, *The Economic Effects of Significant U.S. Import Restraints,* 1999.

[35] Other studies include the Congressional Budget Office, "U.S. Shipping and Shipbuilding Trends and Policy Choices," August 1994. The Budget Office reported a cost of $1.3 billion;. Lawrence J. White estimated costs to be $2 billion in 1984, *International Trade in Ocean Shipping Services: The United States and the World* (Cambridge, MA: American Enterprise Institute, Ballinger Publication, 1988).

[36] Gary C. Hufbauer and Kimberly A. Elliott, *Measuring the Costs of Protection in the United States* (Washington DC: Institute for International Economics, 1993).

[37] Inland shipping was not treated in the model simulation because foreign shippers, who regularly engage in international shipments to and from the United States, would not likely compete in inland markets where U.S. shippers are considered efficient.

proportion to supply of the domestic services.[38] Within the limits of a general static framework, therefore, the model incorporates many of the important long-run features of the economy that are necessary for policy and welfare analysis.

The estimated cost advantage held by potential foreign suppliers is 59 percent of domestic costs at the benchmark. This estimate is based on the weighted average of wet- and dry-cargo cost differentials. Based on information provided by The Maritime Administration (MARAD) of the U.S. Department of Transportation (USDOT), the daily operating cost differential for a foreign-flag tanker relative to a typical (Aframax) tanker in Jones Act trade in 1999 was -52 percent. MARAD also provided information that indicates a -13 percent cost differential on operating costs for a typical dry-cargo vessel (2,000 TEU medium containership).[39] Based on the benchmark input-output data, the Commission established a 15 percent capital payment share on gross revenues. It is assumed that this share is in addition to operating expenses. The capital margin is applied to both foreign and domestic costs symmetrically, which preserves the calculated percent cost differentials based on the data provided by MARAD. The weighted average of the cost differentials is -41 percent resulting in a foreign cost factor of 59 percent.

A number of uncertainties about data and choice of parameters affect the Commission's analysis of the maritime transport sector.[40] Therefore, in addition to analyzing liberalization of only the domestic-build requirement, additional scenarios that assume a range of initial cost differentials are offered. This allows for alternative assumptions about how much of the cost differential can be realized if foreign vessels were allowed to operate in Jones Act trade. Table 5-3 presents the economywide effects of the two primary scenarios, including the effects of complete liberalization at the estimated cost differential of 59 percent, and liberalizing the domestic-build requirement. Results of two additional sensitivity analyses also are presented. The first sensitivity analysis assumes a cost differential that is roughly half of the estimate (resulting in an 80 percent foreign cost factor), and the second assumes a cost differential that is roughly a quarter of the estimate (resulting in a 90 percent foreign cost factor). These sensitivity analyses are helpful because they accommodate a

[38] The value of output investments from the shipbuilding industry attributed to support of the Jones Act fleet is $479 million annually. USDOC, *1997 Economic Census, Manufacturing, Industry Series*, "Ship Building and Repairing," July 1997. To incorporate the decrease in the steady-state investment demand for the shipbuilding industry output, investment in ships is assumed to be proportional to Jones Act fleet services. The difference in ship investment is distributed across all other investments proportionally so that total investment is unchanged.

[39] TEU denotes twenty-foot equivalent units.

[40] Because no foreign fleets operate in U.S. cabotage, no information exists on the characteristics of such a fleet. Cost differentials, which are crucial to the analysis here, rely on observable characteristics of the world fleet.

Table 5-3
Economywide results of liberalizing the coastwise Jones Act fleet, 1999

Scenario	Foreign cost factor[1] (U.S. cost)	Welfare change	Resulting import penetration in coastwise service (share of benchmark domestic supply)	Change in domestic supply of coastwise service	Change in total supply of coastwise service
	Percent	*Million dollars*		*Percent*	
Complete liberalization	[2]59	656	82	-70	12
U.S. build liberalization	59 (Capital Only)	261	0	6	6
Sensitivity 1	80	262	34	-30	4
Sensitivity 2	90	119	15	-14	1

[1] The foreign cost factor is calculated on a gross basis. This determines the position of the foreign residual (available to the U.S.) supply curve. Liberalization is not modeled as an elimination of a tariff equivalent, but a tariff equivalent to the cost factor (on a net basis) can be calculated by dividing the difference between one and the cost factor by the cost factor.

[2] The estimated cost factor is based on a weighted average of wet- and dry-cargo cost differentials. Based on information provided by MARAD, the daily operating cost differential for a foreign flag tanker relative to a typical (Aframax) tanker in Jones Act trade in 1999 was -52 percent. MARAD estimated a -13 percent cost differential for a typical dry cargo vessel of 2,000 TEU. The Commission estimated a 15 percent capital payment share on gross revenues, and assumed this share is in addition to operating expenses. The capital margin was applied to both foreign and domestic costs symmetrically, thereby preserving the calculated cost differentials based on MARAD data.

Source: USITC estimates, except as cited.

broad set of beliefs about how much of the cost advantage can be realized with trade liberalization. Each of the scenarios is listed as a separate row in table 5-3.

The welfare impacts reported in table 5-3 are smaller than those cited from earlier literature, including previous iterations of this report.[41] The change in the estimate reflects a number of changes in the modeling system, including a comprehensive revision of the treatment of coastwise water transportation. More important, however, is an overall shrinkage in coastwise services (see table 5-1). Gross output from oceanborne Jones Act transport fell by approximately 34 percent from 1996 to 1999. This contraction reflects a significantly smaller industry, as many marginal lines left the market before 1999. Because the Jones Act covers a smaller industry in 1999, benefits from liberalization are smaller.

The change in total supply reported in table 5-3 reflected an increase in the aggregate demand for coastal water transportation services. There are two sources for this increase in demand. First, a lower price induced a substitution out of other transportation modes and into coastal shipping. Second, lower coastal water transportation costs reduced the unit production costs in downstream sectors. Output in the downstream sectors increased, resulting in an indirect increase in the demand for transportation.[42]

Complete Liberalization

The effects of complete liberalization reflect full competition between domestic and foreign service providers. Foreign service providers have a considerable cost advantage and therefore capture a considerable portion of the market (82 percent import penetration is reported in table 5-3). However, as service to foreign and international routes is foregone, and new capacity is built to meet U.S. demand, the costs to new entrants in the U.S. market increase (upward sloping foreign supply). The domestic industry's costs fall as less profitable lines are lost to foreign competition. In the liberalized equilibrium, the price for coastwise waterborne transport services is above the initial world price, but below the initial domestic price (a 20.4 percent drop in the realized price is reported in table 5-4). The domestic quantity supplied falls, but this is more than made up for by new imports.

More detailed results from the complete liberalization scenario are presented in table 5-4. Impacts were concentrated in the liberalized sector, with imports capturing $1.5 billion of the market. Domestic output fell by 70 percent, resulting in a loss of nearly 8,000 FTE jobs.[43] With the price of

[41] In the 1999 *Import Restraints* update, a $1.3 billion welfare increase is reported for 1996.

[42] Composite transportation inputs are used in fixed proportions to output in all sectors, but there are substitution opportunities across modes of transportation.

[43] Employment changes are rounded to the nearest thousand because this is the level of precision in the source data for the aggregate sectors.

Table 5-4
Economic effects of complete liberalization of domestic coastwise water transportation, change from benchmark, 1999

Sector	Employment		Output		Imports		Exports		Composite price[3]
	FTE[1]	*Percent*	*Value[2]*	*Percent*	*Value[2]*	*Percent*	*Value[2]*	*Percent*	*Percent*
Water transportation:									
Coastwise water transportation	-7,690	-84.1	-1,287	-70.4	1,498	([4])	([5])	([4])	-20.4
Other water transportation	-650	-0.4	-131	-0.4	([5])	([4])	24	0.1	-0.8
Upstream sector:									
Shipbuilding	-3,140	-3.1	-395	-3.1	-6	-3.0	-27	-3.0	([6])
Downstream sector:									
Chemicals, rubber, and plastic	360	([6])	86	([6])	-14	([6])	19	([6])	([6])
Crude petroleum and natural gas extraction	60	([6])	21	([6])	-16	([6])	([5])	([6])	([6])
Other mining and resource extraction	30	([6])	6	([6])	-1	([6])	1	([6])	([6])
Petroleum refining	10	([6])	11	([6])	-18	-0.1	2	([6])	([6])
Rest of the U.S. economy:									
Agriculture, forestry, and fisheries	350	([6])	62	([6])	-14	-0.1	17	0.1	([6])
Construction	1,000	([5])	132	([6])	([5])	([4])	([5])	([6])	([6])
Nondurable manufacturing	1,020	([6])	169	([6])	-45	([6])	25	([6])	([6])
Durable manufacturing	2,770	([6])	636	([6])	-220	([6])	151	([6])	([6])
Finance, insurance, and real estate	220	([6])	-13	([6])	-4	([6])	3	([6])	([6])
Wholesale and retail trade	2,710	([6])	163	([6])	([5])	([4])	19	([6])	([6])
Transportation, communication, and utilities	-950	([6])	-215	([6])	-64	-0.1	3	([6])	([6])
Other services	-350	([6])	-126	([6])	-10	([6])	3	([6])	([6])

[1] Change in FTE jobs.
[2] In millions of dollars in base-year prices.
[3] Price index relative to the full-consumption consumer price index.
[4] Not applicable: percent change is not defined if the benchmark value is zero.
[5] Change less than $500,000 in absolute value or nontraded sector.
[6] Less than 0.05 percent in absolute value.

Source: USITC estimates.

coastwise shipping falling by 20 percent, other transportation sectors lost market share to imports of coastwise shipping. Air transport to islands covered by the Jones Act and trucking transport might suffer from significant reductions in liner rates. These changes were modest, since the aggregate transport, communications, and utilities sectors reduced output by less than five-hundredths of one percent, representing an elimination of less than 1,000 FTEs. Similarly, output in the other water transportation sector fell by four-tenths of one percent, representing fewer than 1,000 FTEs jobs lost.

The major upstream sector, shipbuilding, experienced the second largest negative impact, with output falling by 3 percent, or $395 million, which resulted in more than 3,000 displaced FTE jobs. Downstream sectors benefitted from the 20 percent fall in the price of coastwise transport, but this constituted a small fraction of overall unit costs. Thus, gains were modest and diffuse. No sector demonstrated output gains greater than one-tenth of one percent, and only in the large manufacturing, construction, and trade sectors were the employment gains greater than 1,000 FTE jobs. New FTE jobs across all disaggregated sectors totaled more than 8,000; however, this creation of FTE jobs was offset by 12,000 FTE jobs lost in shrinking sectors. In net terms 4,000 FTE jobs were lost.[44]

Partial Liberalization Scenarios

Detailed results from simulating the second scenario are presented in table 5-5. The second scenario is based on proposals to liberalize only certain components of the Jones Act, namely the U.S.-build requirement. In the recent past, proponents of the partial liberalization anticipated that changing the U.S.-build requirement could significantly increase the fleet eligible for U.S. coastwise trade, thereby providing more capacity for shipping bulk and other commodities.[45] However, foreign-owned and -operated carriers would still be prohibited by law from entering the market. The quantitative analysis that follows examines a scenario in which domestic carriers are allowed to purchase foreign ships, but import penetration by the foreign water transport industry is prohibited.

[44] The change in workforce participation is less than three one-thousandths of a percent and reflects a dominant general-equilibrium wealth effect on leisure demand as the net wage increases slightly relative to the consumer price index.

[45] For example, one proposal would allow a brief period of time for domestic owners to replace aging containership and roll-on/roll-off vessels that are used in the domestic trades. For further discussion of this proposal, see Warren Leback, "Open the Jones Act Window, Briefly," *Journal of Commerce*, Mar. 31, 1999. Another plan for partial liberalization was contained in Senate Bill 2390, introduced in 1998 by U.S. Sen. Sam Brownback, R-KS, in the 106th Congress. The bill would have modified the Jones Act by allowing non-U.S.-built ships to be used in coastwise trade. Such ships would still be required to be U.S.-crewed and meet U.S. safety and environmental standards.

Table 5-5
Economic effects of removing the domestic-build requirement on domestic coastwise water transportation, change from benchmark, 1999

Sector	Employment		Output		Imports		Exports		Composite price[3]
	FTE[1]	*Percent*	*Value[2]*	*Percent*	*Value[2]*	*Percent*	*Value[2]*	*Percent*	*Percent*
Water transportation:									
Coastwise water transportation	-810	-8.9	111	6.1	([5])	([4])	([5])	([4])	-11.2
Other water transportation	710	0.4	142	0.4	([5])	([4])	102	0.6	-0.4
Upstream sector:									
Shipbuilding	-4,000	-3.9	-503	-3.9	271	132.5	-35	-3.9	([6])
Downstream sector:									
Chemicals, rubber, and plastic	110	([6])	27	([6])	-6	([6])	7	([6])	([6])
Crude petroleum and natural gas extraction	30	([6])	13	([6])	-3	([6])	([5])	([6])	([6])
Other mining and resource extraction	10	([6])	1	([6])	-1	([6])	1	([6])	([6])
Petroleum refining	20	([6])	18	([6])	-6	([6])	1	([6])	([6])
Rest of the U.S. economy:									
Agriculture, forestry, and fisheries	130	([6])	24	([6])	-6	([6])	6	([6])	([6])
Construction	([7])	([6])	1	([6])	([5])	([4])	([5])	([6])	([6])
Nondurable manufacturing	380	([6])	71	([6])	-12	([6])	10	([6])	([6])
Durable manufacturing	120	([6])	29	([6])	-108	([6])	18	([6])	([6])
Finance, insurance, and real estate	260	([6])	68	([6])	([5])	([6])	1	([6])	([6])
Wholesale and retail trade	250	([6])	20	([6])	([5])	([4])	4	([6])	([6])
Transportation,communication, and utilities	-300	([6])	-63	([6])	-19	([6])	1	([6])	([6])
Other services	1,440	([6])	112	([6])	-1	([6])	6	([6])	([6])

[1] Change in FTE jobs.
[2] In millions of dollars in base year prices. Less than 0.05 percent.
[3] Price index relative to the full-consumption consumer price index.
[4] Not applicable: percent change is not defined if the benchmark value is zero.
[5] Change less than $500,000 in absolute value or nontraded sector.
[6] Less than 0.05 percent in absolute value.
[7] Fewer than 5 FTE positions.

Source: USITC estimates.

The predominant impact of removing the domestic-build requirement was on the U.S. shipbuilding industry. Investments in new domestic ships for coastwise domestic transport were eliminated, and replaced by investments in significantly cheaper foreign ships. Output of the domestic shipbuilding industry fell by 4 percent and imports increased by 133 percent. In the long run, decreased capital costs result in reduced operating costs for the coastwise Jones Act fleet.[46] Output of coastwise Jones Act shipments increase by 6 percent. The cost savings were passed forward in a 11 percent rate reduction. Consistent with the complete liberalization scenario, the aggregate transport, communication, and utilities sector lost market share to coastwise transport. Unlike the complete liberalization scenario, however, the model showed an increase in output from the other water transportation sector. In scenario 2, the other water transportation sector benefitted from the less expensive inputs, which included domestic shipbuilding and upstream coastwise transport services. As with the complete liberalization scenario, the impacts of relaxing the domestic-build requirement on the remainder of the economy were diffuse; all of the output changes were less than five-hundredths of a percent.

Truck Transport

Since NAFTA became effective on January 1, 1994, trade between the United States and Mexico has grown significantly, increasing the importance of truck transport services. About 80 percent of total U.S. merchandise trade with Mexico is transported via truck.[47] The number of border crossings grew by 18 percent during 1997-99 (table 5-6). Approximately 80,000 truck tractors, of which 79 percent are of Mexican origin, reportedly cross the U.S.-Mexico border annually.[48]

---

[46] It is assumed that all of the cost savings of operating a less expensive capital stock were realized in the production decisions of the domestic carriers. In reality, there would be a considerable lag associated with this realization, because ships depreciate very slowly. The assumption considered here is a counterfactual equilibrium in which the domestic build constraint never existed. Similarly, investment in foreign ships is consistent with the long-run equilibrium, explicitly ignoring dynamic adjustment issues, which are beyond the scope of the model.

[47] Rail transport is a distant second, accounting for 15 percent of the value of U.S. land imports from Mexico. USDOT, Bureau of Transportation Statistics, table 1-50, "Value of U.S. Land Exports to and Imports from Canada and Mexico by Mode," found at Internet address *http://www.bts.gov/btsprod,nts/Ch1_web/1-50.htm*, retrieved Aug. 17, 2001.

[48] Power units do not include trailers. See The International Association of Chiefs of Police, "Estimates of Commercial Motor Vehicles Using the Southwest Border Crossings," for USDOT, Federal Motor Carriers Safety Administration, Sept. 20, 2000, p. 1.

Table 5-6
Truck transport: U.S. industry summary data, 1997-99

Item	1997	1998	1999
U.S. total revenue *(million dollars)*	88,426	94,419	101,817
U.S. employment *(in 1,000s)*	1,331	1,382	1,423
Number of crossings *(actual)*	3,689,665	3,946,543	4,358,121
Value of U.S. imports from Mexico transported via truck *(million dollars)*	56,716	65,884	76,448
Value of U.S. exports to Mexico transported via truck *(million dollars)*	55,593	60,432	66,924

Source: USDOC, Bureau of the Census, *1999 Transportation Annual Survey*, table 2.2, found at Internet address *http://www.census.gov/svsd/www/sas48-2.pdf*, retrieved Nov. 5, 2001; USDOC, Bureau of the Census, *1997 Economic Survey Transportation and Warehousing*, table 1, MAICS 4841, Aug. 9, 2000; USDOT, Bureau of Transportation Statistics, Transborder Surface Freight Data, National Summary Report, 1999, 1998, 1997, found at Internet address *http://199.79.179.77/ntda/tbscd/reports/nat_m99.html*, retrieved Sept. 14, 2001, and U.S. Department of Labor, Bureau of Labor Statistics, National Employment, Hours, and Earnings, SIC 421, found at Internet address *http://146.142.4.24.cgi-bin/srgate*, retrieved Sept. 26, 2001.

To facilitate increased trade in truck transport services, the United States worked with its NAFTA partners to reduce technical or regulatory barriers to trade in these services. Such barriers generally consisted of truck and driver safety standards and resulted from concerns about discrepancies between countries' regulations and enforcement capabilities. Regulatory harmonization between U.S. and Canadian truck transport services began in the 1980s, continued under the United States-Canada Free Trade Agreement, and is now largely achieved.

In contrast, substantial barriers to Mexican-U.S. trucking harmonization existed at the time of NAFTA signing. NAFTA established a timetable by which Mexican trucking interests would be granted full cross-border access to the United States, and U.S. interests would have comparable access to the Mexican market. In 1999, U.S. imports of truck transport services from Mexico continued to encounter restraints because of safety concerns.

Barriers to cross-border trucking services remain much as they were in 1999, the base year of the study. The original timetable has yet to be fully implemented (table 5-7). However, recent legislation grants Mexican trucks access beyond the commercial zones[49] provided that such trucks and their drivers comply with the new safety regime.[50]

[49] Commercial zones extend 3 to 20 miles north of U.S. border cities.

[50] Public Law 107-87, enacted Dec. 18, 2001. The ensuing implementation procedures will be determined by USDOT.

Table 5-7
Original NAFTA timetable for U.S.-Mexico truck transport services

Original milestone	Goal	Status
December 1992	NAFTA signed by Canada,[1] Mexico, and the United States	Enacted into law.
January 1994	NAFTA became effective	Trucks may operate in commercial zones along the U.S.-Mexico border.
December 18, 1995	Commercial carrier access to be extended to Arizona, California, New Mexico, and Texas	Safety concerns postponed implementation.
January 1, 2000	Commercial carrier access to be extended to all NAFTA countries	USDOT appropriations for fiscal year 2002 provided increased funding, and established new requirements, related to Mexican motor carriers' operations beyond the commercial zones.
January 2, 2004	Limits on cross-border investments in motor carriers to be eliminated	No changes.

[1] The U.S.-Canadian border was opened to cross-border trucking in 1982.

Source: Compiled by the Commission.

NAFTA Developments

When NAFTA was signed in December 1992, the United States agreed to permit Mexican trucks to transport goods first into the four southern border states (Arizona, California, New Mexico, and Texas) and later into the rest of the country.[51] However, the United States postponed certain further implementation of the agreement in late 1995, citing safety concerns. The Government of Mexico formally protested to a NAFTA arbitration panel, arguing that the United States breached NAFTA Articles 1202 (national treatment for cross-border services) and 1203 (most-favored-nation treatment for cross-border services) by failing to implement the trucking provisions by

[51] Foreign trucks generally cannot deliver goods from one U.S. location to another. Under U.S. law, Canadian and Mexican trucks can only engage in international cargo transport to the United States. Although NAFTA provisions would permit Mexican trucks to operate inside the United States, the trade agreement also requires that Mexican trucks and truck drivers meet U.S. standards for commercial truck operations, such as safety requirements, hours of service, licensing, and insurance. Mexican carriers would apply for U.S. operating authority, which would be granted only if U.S. standards were met. Duane W. Acklie, Chairman, American Trucking Associations, statement prepared for the Hearing on the NAFTA Arbitration Panel Decision and Safety Issues Related to Implementing the NAFTA Motor Carrier Provisions, Commerce, Science and Transportation Committee, U.S. Senate, July 18, 2001, p. 2.

the original timetable.[52] The United States argued to the NAFTA arbitral panel that:

> *...[the] Mexican safety regime lacks core components, such as comprehensive truck equipment standards and fully functioning roadside inspection or on-site review systems. . . [G]iven the experience to-date with the safety compliance record of Mexican trucks operating in the U.S. border zone, the United States' decision to delay processing Mexican carriers' applications for operating authority until further progress is made on cooperative safety efforts is both prudent and consistent with U.S. obligations under the NAFTA.*[53]

In February 2001, the NAFTA arbitral panel found that the United States violated NAFTA by failing to consider on its own merit each application by a Mexican trucking firm for authority to operate in the U.S. market. The panel indicated that the U.S. Government may establish a level of protection that it considers appropriate for legitimate regulatory objectives, but should review each applicant's ability to comply with U.S. regulations. Furthermore, the United States may treat applications from Mexican trucking firms differently from Canadian firms "as long as they are reviewed on a case-by-case basis."[54]

Equipment

Mexican trucks and truck drivers are currently allowed to operate within commercial zones along the U.S. southern border, where shipments may be unloaded or trailers transferred to U.S. carriers for transportation into the United States.[55] The movement of goods at the border is performed by drayage, or short-haul, trucks.[56] Out-of-service rates commonly cited for Mexican equipment refer to services performed by drayage trucks rather than

[52] NAFTA Arbitral Panel Established Pursuant to Chapter Twenty, In the Matter of Cross-Border Trucking Services, Final Report of the Panel, Secretariat File No. USA-MEX-98-2009-01, February 6, 2001, pp. 21-33.

[53] Ibid., p. 33.

[54] Ibid., p. 82.

[55] The 1982 Bus Regulatory Reform Act prohibited Mexican trucks from operating outside of designated commercial zones.

[56] Drayage trucks haul trailers across the border to warehouses or freight yards for pickup on the other side. On these trips, trucks return with empty trailers to Mexico. Drayage trucks generally are older equipment used to transfer freight across the border; new equipment is not used for these short-haul trips, but would be necessary for long-haul trips resulting from an open border. Duane W. Acklie, Chairman, American Trucking Associations, statement prepared for the Hearing on the NAFTA Arbitration Panel Decision and Safety Issues Related to Implementing the NAFTA Motor Carrier Provisions, Commerce, Science and Transportation Committee, U.S. Senate, July 18, 2001, p. 3.

for long-haul trucks that operate within the Mexican interior.[57] The Mexican truck fleet is relatively small, with approximately 83,000 carriers and 277,000 tractors and trailers, compared to the U.S. truck fleet, which includes 600,000 carriers and 6.3 million tractors and trailers.[58] A study conducted by the U.S. GAO indicated that approximately 80 percent of the Mexican fleet does not meet U.S. safety and emissions standards.[59]

The U.S. and Mexican truck fleets also differ in terms of size and weight. U.S. truck size and weight limitations are a compilation of federal, state, and local requirements. While current Federal truck size and weight limits have generally been in effect since 1982, several states have requested exceptions to permit larger and heavier vehicles to operate on their highways, especially along international corridors. Compared to the United States, Mexico and Canada generally allow larger and heavier trucks on their roadways.

Regulatory Harmonization

Concerns about harmonization of U.S. and Mexican safety standards have hindered full implementation of NAFTA cross-border trucking provisions. Several items of concern and their current status are identified in table 5-8. The GAO report concluded that while strict harmonization of trucking regulation may not be achieved, host country regulations will be enforced.[60]

U.S. Inspection Capabilities

There continues to be concern over the availability of adequate border inspection facilities and personnel to inspect Mexican trucks prior to entry into the interior of the United States. Some federal financial and technical assistance is available to fill the shortfall, but each border state has primary responsibility for enforcing its truck regulations. State enforcement strategies and efforts differ widely. For example, California has 24-hour operations and

---

[57] The American Trucking Associations claims that out-of-service rates obtained for Mexican trucks operating at the border should not be compared to overall U.S. out-of-service rates because these rates reflect the serviceability of different types of trucks. However, the out-of-service rate for Mexican trucks in California is much lower and appears to correlate to the high-quality facilities and greater number of inspections performed at the major California border crossings.

[58] GAO, Report to Congressional requesters, *North American Free Trade Agreement: Coordinated Operational Plan Needed to Ensure Mexican Trucks' Compliance with U.S. Standards*, GAO-02-238, Dec. 10, 2001.

[59] Ibid.

[60] GAO, Report to Congressional requesters, "*Commercial Trucking: Safety and Infrastructure Issues Under the North American Free Trade Agreement*," GAO/RCED-96-61, February 1996, 3.

Table 5-8
Status of safety standards harmonization

Item	Status
Commercial Drivers Licenses	In a 1991 Memorandum of Understanding, the United States and Mexico agreed to accept each other's Commercial Drivers Licenses. The NAFTA Land Transportation Standards Subcommittee further agreed that commercial drivers engaged in international commerce should be at least 21 years old and able to communicate in the country in which they operate.
Driver logs	Logs have been required of hazardous material carriers since April 1993 and by all commercial vehicle drivers since March 2000.
Driver physical qualifications	The United States requires commercial drivers to have a commercial license and a medical examiner's certificate. The Mexican licensing program includes a physical evaluation, but does not include a separate certificate.
Drug and alcohol testing	A 1998 Memorandum of Understanding harmonized the administration of drug and alcohol testing for commercial driver's license holders. However, Mexico does not have a testing laboratory certified to U.S. standards.
Hours of service	Mexico is reportedly developing hours of service requirements for commercial drivers.
Insurance	U.S. regulations require all motor carriers operating in the United States to have minimum levels of financial responsibility ranging from $750,000 to $5 million. Mexican coverage (approximately valued at $70,000) does not apply in the United States.
Safety databases	Mexican information systems for commercial drivers, motor carriers, and commercial vehicles were established in 2000.
Vehicle safety inspections	Mexican safety standards are based on Commercial Vehicle Safety Alliance out-of-service criteria and commercial driver and vehicle safety inspection standards. Minimum standards went into effect in July 2000. Domestic roadside inspection programs are to be implemented in October 2001.

Source: USDOT, Office of Inspector General, "Interim Report on Status of Implementing the North American Free Trade Agreement's Cross-Border Trucking Provisions," report No. MH-2001-059, May 8, 2001, pp. 16-18.

provides its own full-time inspectors, whereas the other three states do not.[61] Texas, the state with the greatest number of truck crossings, accounting for 69 percent of the volume of U.S.-Mexico border truck traffic, does not operate any 24-hour facilities. Furthermore, infrastructure projects in Texas have been hampered by a shortfall in funding.[62]

Most border inspection facilities lack sufficient space to perform the needed number of inspections or to park out-of-service vehicles, and these facilities are unable to expand their hours of operation to meet demand. For example, some state agencies in Texas reportedly prefer to conduct roadside inspections rather than work from one location,[63] and inspection facilities in urban areas have limited space.[64] Furthermore, a recent USDOT Inspector General report suggested that more inspectors are needed to meet demand at the southern border.[65]

Currently, no fixed weight station facilities exist on the U.S. side of the border to enforce weight restrictions on Mexican trucks. States can use federal highway funds designed to foster the development of an intermodal transportation system to build truck weight or inspection facilities. The funds are allocated based on state project priorities set by states.[66]

Efficiency Implications

Once the border is fully open, the drayage trucks that currently pick up and transport trailers from one side of the border to the other will likely be replaced by long-haul trucks. USDOT recently speculated that "the number and percentage of safety compliant Mexican trucks will dramatically increase because long-haul trucks will be different from and in a better condition than the short-haul trucks that currently comprise the commercial zone cross-border traffic."[67]

---

[61] California has made significant strides to improve inspection capabilities. In 1996, California built two new facilities at a cost of $15 million each, and had an average out-of-service rate for Mexican trucks of 28 percent in 1999, compared to 36 percent for the southern border.

[62] Texas has been reluctant to use state funds for border-related projects because such projects are associated with NAFTA and thus perceived to be a national issue. GAO, *Commercial Trucking: Safety Concerns About Mexican Trucks Remain Even as Inspection Activity Increases*, GAO/RCED-97-68, April 1997, p. 13.

[63] Ibid.

[64] Ibid.

[65] USDOT, Office of Inspector General, *Interim Report on Status of Implementing the North American Free Trade Agreement's Cross-Border Trucking Provisions*, report No. MH-2001-059, May 8, 2001, p. 9.

[66] GAO, *Commercial Trucking: Safety Concerns About Mexican Trucks Remain Even as Inspection Activity Increases*, GAO/RCED-97-68, April 1997, p. 22.

[67] USDOT, Office of Inspector General, *Motor Carrier Safety Program for Commercial Trucks at U.S. Borders*, report No. TR-1999-034, Dec. 28, 1998, p. xi.

Border crossings currently require three drivers and three tractors to perform a single international freight movement. A U.S. carrier handles freight on the U.S. side, a Mexican carrier handles freight on the Mexican side, and a "middleman" or drayage operator hauls the trailer across the border. The most negative impact of the drayage system reportedly is congestion at ports of entry along the border, compounded by the frequency of trailers that come back empty because drayage is a one-way operation across the border. This process results in extra trucks on the road, congestion, delays, and overhandling of shipments, which lead to increased costs and lost and damaged freight. Increased congestion generated by the growth in U.S.-Mexico trade has strained border facilities and personnel.[68] Delays due to U.S. Customs regulations also add to the cost of border crossings because insufficient facilities exist to accommodate both U.S. Customs and inspections personnel.[69] However, this system is considered by some experts to be the most efficient possible, under the given constraints.[70]

The Federal Reserve Bank of Dallas suggested that implementing the NAFTA trucking provisions is only one part of improved border transport efficiency. Other changes are needed to ease peak travel time congestion, increase U.S. Customs manpower, and to assist Mexican customs brokers in revising their policies. Mexican customs brokers require inspection on the U.S. side of the border, thus stimulating short-haul freight forwarding and warehousing of goods. Since the current prohibitions restricting international truck transport in the United States are not the only causes of border transportation delays, the magnitude of effects of NAFTA's truck transport provisions on the movement of goods across the border, once implemented, is unclear.[71]

Air Transport

In the international marketplace, air transport is governed by (1) a network of bilateral agreements that regulate entry or directly restrict market participation by foreign airlines; (2) domestic regulatory systems that effectively restrict entry of foreign carriers; (3) restrictions on ancillary domestic markets that impair a foreign carrier's ability to participate; and (4)

[68] American Trucking Associations, submission to USDOT, Federal Motor Carriers Safety Administration, July 2, 2001.

[69] Such congestion is compounded by the fact that in 1999, 79 percent of total truck crossings occurred at five locations: Laredo, TX; El Paso, TX; Otay Mesa, CA; Hidalgo, TX; and Brownsville, TX. See USDOT, Bureau of Transportation Statistics table 1-45 U.S.-Mexican Border Land-Freight Gateways: 1999, found at Internet address *http://www.bts.gov/btsprod/nts/Ch1_web/1-45.htm*, retrieved Aug. 17, 2001.

[70] Dr. Robert Harrison, University of Texas, Austin, USITC staff telephone interview August 29, 2001.

[71] Keith Phillips and Carlos Manzanares, Federal Reserve Bank of Dallas, "Transportation Infrastructure and the Border Economy," *The Border Economy* (June 2001) p. 14, note 7.

subsidization and state ownership of competing foreign airlines. Three of these factors–bilateral agreements, domestic regulatory systems, and restrictions on ancillary services—apply to the U.S. air services market and are discussed in the next section. Summary data for the U.S. air transport sector are presented in table 5-9.

Table 5-9
Air transport: U.S. industry summary data, 1997-99

Item	1997	1998	1999
Revenues *(billion dollars)*	109.6	113.5	118.3
Employment *(1,000 FTEs)*	586	621	646
Exports[1] *(billion dollars)*	32.9	32.1	32.2
Imports[1] *(billion dollars)*	30.7	32.5	35.4

[1] Includes passenger fares, freight transport, and port services.

Source: USDOT, Bureau of Transportation Statistics, *National Transportation Statistics 2000*; USDOC, BEA, *Survey of Current Business*, Oct. 1999 and Oct. 2000; and Air Transport Association, *2001 Annual Report*.

Bilateral Agreements

Bilateral air service agreements permit signatory countries to restrict the operation of foreign carriers flying to, from, and through their domestic air markets. In recent years, most bilaterals negotiated by the United States have liberalized restrictions, resulting in open-skies agreements. To date, the United States has concluded 56 open-skies agreements with foreign countries.[72] Open-skies agreements remove fare and route restrictions on service between signatory countries; permit signatory countries' airlines to fly into each other's territory and to reach third-country markets; and allow them to jointly market their services in code sharing arrangements.[73] But the accepted definition of open-skies does not allow cabotage, nor does it incorporate provisions on foreign ownership and control of U.S. carriers.[74]

[72] USDOT, Office of the Assistant Secretary for Aviation and International Affairs, "New/Expanded Bilateral Air Services Agreements," found at Internet address *http://ostpxweb.dot.gov/aviation/intav/agmts.htm*, retrieved Sept. 24, 2001; USDOT News, "United States, Sri Lanka Reach Open-Skies Aviation Agreement," November 1, 2001, found at Internet address *http://www.dot.gov/affairs/dot11401.htm*, retrieved Nov. 5, 2001.

[73] Code sharing arrangements permit the integration of two or more airlines' flights under a single code, and allow them to coordinate flight schedules and payment methods. For a more detailed discussion of the elements of open-skies agreements, see USITC, *Import Restraints: Second Update*, Publication 3201, 1999.

[74] Cabotage is the transport of passengers between two points within the same country. Open-skies agreements do not allow foreign carriers to transport passengers point-to-point within the partner's country.

Open-skies agreements are intended to increase competition, decrease fare and freight rates, and increase trade and tourism in signatory countries. However, open-skies agreements are less likely to benefit countries whose air transport markets have significant capacity constraints, existing liberal access, or a small number of dominant carriers that control a large proportion of takeoff and landing slots.

U.S. Domestic Regulations

Three U.S. laws governing the domestic air transport industry affect the operation of foreign carriers in the U.S. market. These laws apply to foreign ownership of U.S. airlines; the leasing of aircraft and crew by U.S. airlines from foreign entities (wet leasing); and the transport by foreign airlines of U.S. Government officials, mail, and cargo. First, under the Federal Aviation Act of 1958, foreign entities are not permitted to hold more than 25 percent voting stock in a U.S. airline and 49 percent nonvoting stock.[75] According to U.S. industry representatives, ownership restrictions on U.S. airlines have been established to protect national security and passenger safety.[76] Second, under U.S. law, foreign cargo carriers are prohibited from wet leasing their aircraft to U.S. airlines.[77] In 1998, a group of air cargo carriers from the United Kingdom formed the British Cargo Airline Alliance to request permission from the U.S. Government to allow British entities to wet lease to U.S. airlines.[78] British officials held that wet leasing would not dilute U.S. Government cabotage restrictions. They also maintained that if a British firm were to wet lease its aircraft to an airline from a third country, that airline could only provide service to the U.S. market if the airline's country of registration also had a bilateral agreement with the United States.[79] At the time of this report there are ongoing discussions on allowing British entities to wet lease to U.S. airlines.

---

[75] Public Law 85-726, 72 stat. 731.

[76] Industry representatives, "Airline Ownership: Are Citizenship Laws Passé?" presentation by industry representatives at the 8th Annual International Aviation Symposium, Phoenix, AZ, May 3-5, 1999.

[77] Wet leasing allows an airline to lease aircraft, including crew, maintenance, and insurance, from a second party, and to operate such aircraft under its own name. Select Committee on Environment, Transport, and Regional Affairs, "Memorandum by the British Cargo Airline Alliance," April 12, 2000, found at Internet address *http://www.parliament.the-stationery-office.co.uk/*, retrieved Sept. 27, 2001.

[78] Members of BCAA include British air cargo carriers Air Foyle, Atlantic Airlines, Channel Express, and HeavyLift Cargo Airlines. Roger Turney, "All Wet?" *Air Cargo World Online*, February 2000, found at Internet address *http://www.aircargoworld.com*, retrieved Sept. 26, 2001.

[79] Select Committee on Environment, Transport, and Regional Affairs, "Memorandum by the British Cargo Alliance," Apr. 12, 2000, found at Internet address *http://www.parliament.the-stationery-office.co.uk/*, retrieved Sept. 27, 2001.

Finally, regulations under the Fly America Act[80] require that federal employees and others traveling abroad on U.S. Government business fly on U.S.-flag air carriers.[81] Similarly, the Civil Reserve Air Fleet program, administered by the U.S. Government, reserves the transport of federally generated cargo and mail to U.S. airlines. In return, participants in the program provide airlift assistance to the U.S. Government in times of national emergency.[82]

Restrictions on Ancillary Domestic Markets

The Annex on Air Transport Services, contained within the WTO's General Agreement on Trade in Services (GATS),[83] addresses three categories of ancillary services with respect to air transport: (1) aircraft maintenance and repair; (2) the selling and marketing of air transport services; and (3) computer reservation system services. Aircraft maintenance and repair apply only to those activities performed on aircraft while on the ground. The selling and marketing of air transport services includes advertising and the distribution of airline tickets. Computer reservation system services provide information about airline fares and seat availability.[84] Under the GATS, the United States made commitments on aircraft maintenance and repair only, permitting foreign firms to provide this service without restriction.[85] The United States has not made commitments on the sale and marketing of air transport services or on computer reservation system services, indicating foreign firms may be restricted in providing these services to the U.S. market.[86]

---

[80] 49 U.S.C. App. 1517.

[81] A U.S. air carrier is defined as one that holds a certificate under section 401 of the Federal Aviation Act of 1958. Under certain circumstances, a federal employee may use a foreign carrier when a U.S.-flag carrier is unavailable. "The Fly America Act: Guidelines for International Travel Paid for by the Government," found at Internet address *http://www.egr.msu.edu/der/service/faact.html*, retrieved Sept. 25, 2001.

[82] U.S. Department of the Air Force, "Civil Reserve Air Fleet, Fact Sheet," found at Internet Address *http://www.af.mil/news/factsheets/Civil_Reserve_Air_Fleet.html*, retrieved Sept. 27, 2001.

[83] The GATS does not include provisions on traffic rights or "services directly related to traffic rights." These services are negotiated under bilateral air-service agreements. WTO, GATS, "Annex on Air Transport Services," summary document found at Internet address *http://www.wto.org/wto/services/9-anats.htm*, retrieved Feb. 4, 1999.

[84] Ibid.

[85] This does not include line maintenance or other maintenance and repair activities undertaken by an airline, or its agents on aircraft it owns, leases, or operates. WTO, GATS, The United States of America: Schedule of Specific Commitments, GATS/SC/90, April 1994, p. 75.

[86] Ibid.

Recent Developments in International Air Transport Services

The United States continues to negotiate open-skies agreements with global aviation partners. Since 1998, the United States has concluded more than 25 new open-skies agreements, including those with Argentina, France, Italy, Korea, and Portugal.[87] A separate all-cargo open-skies agreement between the United States and Australia, signed in December 1999, removes virtually all restrictions on air cargo services between the two signatory countries. The United States also has negotiated a number of liberalized bilateral air service agreements, including those with China, Mexico, Russia, and Vietnam, that permit signatories to expand the range of services they offer in each other's markets.[88] In addition, the United States is scheduled to revisit discussions on open skies with Japan. In 1998, the United States and Japan signed a Memorandum of Understanding (MOU), which amended the U.S.-Japan bilateral air service agreement and expanded the operating rights of U.S. and Japanese carriers in these markets.[89] The MOU remained in effect until December 31, 2001.[90] The United Kingdom is a large aviation partner with whom the United States has yet to conclude an open-skies agreement. Previously, U.S.-U.K. discussions on open-skies centered around a proposed alliance between American Airlines and British Airways. In July 1999, the USDOT rejected an application by the two carriers to receive antitrust immunity for their alliance. The European Union and the British Government have requested that, should an alliance between American Airlines and British Airways take place, the two carriers cede to one another no less than 267 take-off and landing slots at Heathrow Airport near London.[91] The two

[87] Separately, in November 2000, the United States concluded its first plurilateral open- skies agreement with Brunei, Chile, New Zealand, and Singapore. The agreement permits signatories to provide air service to each other's markets with relatively few restrictions. USDOT, Office of the Assistant Secretary for Aviation and International Affairs, "Regional/Plurilateral/Multilateral Open-Skies Agreements," found at Internet address *http://ostpxweb.dot.gov/aviation/intav/agmts.htm*, retrieved Sept. 24, 2001.

[88] The United States and Jamaica signed a second all-cargo, open-skies agreement in October 2000.

[89] *Aviation Daily*, "U.S., Japan to Talk Open skies, Narita Runway, Cargo Expansion," July 25, 2001.

[90] Memorandum of Understanding amending the Civil Air Transport Agreement between Japan and the United States of America, signed Mar. 14, 1998, pp. 21-23.

[91] American Airlines and British Airways recently submitted a new application for approval of a scaled-back version of their alliance to both the U.S. and British Governments, as well as to the European Commission. The U.S. Government has indicated that approval of the alliance likely would be followed by discussion of an open-skies agreement between the United States and the United Kingdom. *Aviation Daily*, "AA-BA Relaunch Alliance, File for Antitrust Immunity," Aug. 6, 2001.

airlines currently hold more than 60 percent of the slots at Heathrow used to transport passengers to the United States.[92]

Finally, the United States began discussions with the European Commission in 1999 to establish a Transatlantic Common Aviation Area (TCAA). The TCAA would harmonize aviation regulations among signatory countries and enhance market access for member-country airlines. Negotiations between the United States and the European Union on the TCAA are currently at a standstill until the European Commission is given authority to negotiate aviation agreements on behalf of EU members.[93]

Financial Services

Regulation of the financial services market in the United States is complex, controlled by multiple regulatory bodies at both the state and federal levels. In the insurance sector, each state's insurance commissioner is the primary regulator of the industry. In the banking sector, banks choose whether to operate under a state or a federal charter, subject to the appropriate set of regulators. Both state and federally chartered banks participate in the Federal Reserve System and the Federal Deposit Insurance Corporation.[94] The securities sector is primarily regulated at the federal level by the Securities and Exchange Commission (SEC), although many states impose restrictions to protect small investors. U.S. import restraints in the securities industry that have received particular attention are outlined in the next section. The 17 additional federal-level restraints on financial services are summarized in table 5-10, which outlines import restraints in the insurance sector and in table 5-11, which outlines restraints in the banking and securities sectors.[95]

---

[92] *Aviation Daily*, "Steenland Warns Against AA-BA; NW Operations Running Well," July 18, 2001.

[93] In 1998, the European Commission filed a suit before the European Court of Justice against eight EU member states that concluded separate bilateral aviation agreements with the United States. The European Commission claims that these agreements contravene EU law. *Airwise News,* "European Commission Takes Eight Member Nations to Court Over Aviation Agreements," Oct. 1, 2001.

[94] The Federal Reserve is the U.S. central bank and lender of last resort, and is also responsible for setting U.S. monetary policy. The FDIC is the agency which administers the U.S. bank deposit insurance program.

[95] There are at least 40 other restrictions on financial services trade contained in the U.S. Schedule of Commitments and other U.S. laws, the majority of which are imposed by the states and are outside the scope of this report. The degree to which these state-based restrictions constitute substantial impediments to trade is believed to be small. WTO, GATS, United States: Schedule of Specific Commitments, supplement 3 (GATS/SC/90/Suppl.3), February 26, 1998. For a list of the state-level import restraints, see USITC, *U.S. Import Restraints: Second Update,* Publication 3201, 1999, appendix C.

Table 5-10
Import restraints in the U.S. insurance sector (life and non-life)

Primary insurance:
A federal excise tax of 1 percent on life insurance premiums and 4 percent on non-life premiums is imposed on cross-border supply of insurance from foreign companies covering U.S. risks.
For maritime vessels built under federally guaranteed mortgage funds and insured by a foreign company, the insured must demonstrate that U.S. insurers were given the opportunity, but declined to cover the risks.
The United States reserves the right to restrict the market access of foreign insurers, if those foreign companies are based in countries which have acted to compel a U.S. person or company to reduce its share of ownership in an insurance services provider to a level below that prevailing on December 12, 1997 (the date of the WTO financial services agreement).
Reinsurance:
A federal excise tax of 1 percent on insurance premiums is imposed on cross-border supply of insurance from foreign companies covering U.S. risks.

Source: WTO, GATS, *United States: Schedule of Specific Commitments, supplement 3* (GATS/SC/90/Suppl.3), Feb. 26, 1998.

In the securities industry, the SEC generally provides national treatment and nondiscriminatory market access, meaning that SEC requirements are applied to financial firms equally, whether they are owned by U.S. or foreign citizens, and whether the firms are based in the United States or elsewhere. All broker-dealers are required to register with the SEC, but are not required to report the extent to which they are owned by foreigners. The single exception to the principle of equal market access is that, under the U.S. Investment Company Act of 1940, foreign investment advisers are required to register with the SEC.[96] In order to register, the SEC requires foreign mutual funds to set up a separate, duplicate fund in the United States, making it impractical for foreign funds to meet the conditions of the Act.[97]

Table 5-12 highlights U.S. market and trade data for financial services. The degree to which U.S. import restraints impede trade in financial services is believed to be small. The current business activities of foreign firms in the U.S. financial services markets provide substantial evidence of their penetration of the U.S. economy. As of December 31, 1999, 283 foreign banks from 65 countries operated in the United States, with assets totaling $1.2 trillion. Foreign banks accounted for 21.5 percent of the assets of all FDIC-insured commercial banks in the United States.[98]

[96] U.S. Department of the Treasury, "National Treatment Study," November 1998.

[97] Representative of the European Commission, telephone interview with USITC staff, Oct. 12, 2001; European Union, Market Access Database, found at Internet address *http://www.mkaccdb.eu.int/mkdb/chksel.pl*, retrieved Sept. 7, 2001.

[98] USITC calculations from data provided by the U.S. Federal Reserve Board, Internet address *http://www.federalreserve.gov/releases/*, retrieved Sept. 14, 2001; and the Federal Deposit Insurance Corporation, Internet address *http://www. fdic.gov/statistical/*, retrieved Sept. 14, 2001.

Table 5-11
Import restraints in the U.S. banking and securities sectors

Banking sector:

All directors of a national bank must be U.S. citizens, unless a national bank is an affiliate or subsidiary of a foreign bank, in which case a majority of the directors must be U.S. citizens.

Foreign ownership of Edge corporations[1] is limited to foreign banks and U.S. subsidiaries of foreign banks, but not foreign non-bank firms.

Branches of corporations organized under a foreign country's law are prohibited from establishing a credit union, savings bank, home loan or thrift business in the United States.

Foreign banks must establish an insured banking subsidiary in order to accept domestic retail deposits of less than $100,000, unless the foreign bank branch was engaged in insured deposit-taking activities on December 19, 1991.

Foreign banks cannot be members of the Federal Reserve system, and thus may not vote for directors of a Federal Reserve Bank. Foreign-owned bank subsidiaries are not subject to this measure.

The United States reserves the right to impose restrictions on the expansion of foreign banks beyond their "home states" via the establishment or acquisition of branches in another state.

Securities sector:

Foreign financial firms are required to register, pay a fee, and submit reports under the Investment Advisers Act of 1940, in order to engage in securities advisory and investment management services in the United States.

Federal law prohibits the offer or sale of futures contracts on onions, options contracts on onions, and options on futures contracts on onions in the United States, and services related thereto.

The United States reserves the right to impose restrictions on the authority to act as a sole trustee of an indenture for a bond offering in the United States.

The United States reserves the right to impose restrictions on the use of simplified registration and periodic reporting forms for securities issued by small business corporations.

The United States reserves the right to impose limitations on the granting or continuation of Federal Reserve designation as a primary dealer in U.S. Government debt.

The United States reserves the right to employ reciprocity tests to grant foreign persons the authority to act as a sole trustee of an indenture for a bond offering in the United States and to designate a foreign person as a primary dealer in U.S. Government debt securities.

On a reciprocal basis, the United States allows a broker-dealer registered under U.S. law but based in Canada to maintain its required reserves in a Canadian bank, subject to Canadian supervision.

[1] An Edge or Edge Act corporation is a banking corporation chartered by the Federal Reserve Board, rather than by a state, to engage in international banking. Edge Act corporations may be owned by either domestic or foreign banks, and may operate interstate branches, accept deposits outside the United States, and invest in non-U.S. firms. See, for example, Michael Fitch, *Dictionary of Banking* (New York: John Wiley & Sons, 1993), p. 212.

Source: WTO, GATS, *United States: Schedule of Specific Commitments, supplement 3* (GATS/SC/90/Suppl.3), Feb. 26, 1998.

Table 5-12
Banking, insurance, and other financial services: Summary data, 1997-99

Item	1997	1998	1999
Gross output *(billion dollars)*	1,100.3	1,182.8	1,253.4
Employment *(1,000 FTEs)*	5,260.0	5,445.0	5,552.0
Imports[1] *(million dollars)*	9,220.0	12,641.0	7,652.0
Exports[2] *(million dollars)*	12,716.0	13,462.0	16,220.0

[1] For banking and securities, the figures reflect brokerage services, private placement services, underwriting services, financial management services, credit card services, credit-related services, financial advisory and custody services, securities lending services, and other financial services. For insurance, the figures reflect primary and reinsurance premiums (net of claims remitted) paid by foreign persons to U.S. carriers operating in the U.S. market.

[2] For banking and securities, the figures reflect brokerage services, private placement services, underwriting services, financial management services, credit card services, credit-related services, financial advisory and custody services, securities lending services, and other financial services. For insurance, the figures reflect primary and reinsurance premiums (net of claims remitted) paid by U.S. persons to foreign carriers operating in their home market.

Sources: Gross output: USDOC, BEA, *Survey of Current Business,* Dec. 2000, 32; employment: *Survey of Current Business,* Sept. 2000, D-35; imports and exports: *Survey of Current Business,* Oct. 2000, pp. 144-149.

As of 1999, 498 foreign insurance companies–consisting of 109 life insurance companies, 334 non-life companies, and 55 reinsurance companies–operated in the United States.[99] Foreign-owned firms accounted for approximately 6 percent of all U.S. life insurance firms, and 10 percent of U.S. property/casualty firms.[100]

[99] Unpublished information from the National Association of Insurance Commissioners, facsimile to USITC staff, Sept. 19, 2001.

[100] USITC calculations from data provided by the National Association of Insurance Commissioners and the Insurance Information Institute. Similar data on reinsurance firms is not available.

CHAPTER 6
Significant Tariff Restraints

Introduction

This chapter identifies sectors subject to relatively high tariffs and examines the economic impact of removing these tariffs. Removal of tariff spikes can have ripple effects through the economy, both upstream and downstream from the industry in question. Specifically, removal of a high tariff on goods produced by a particular industry can lead to contraction of the upstream industries as demand falls and expansion of the downstream industry as the prices of inputs fall.

While this analysis focuses on the prevailing tariffs in 1999, it is worth noting that U.S. tariffs generally have been falling over time. Table 6-1 demonstrates this trend at a high level of aggregation, by single-digit Standard Industrial Trade Classification (SITC). The trade-weighted average tariff rate for all imports fell by almost half between the years 1992 and 2000, from 3.15 percent to 1.59 percent. This trend is mirrored in the 10 aggregate sectors. Ignoring the catch-all sector 9, "commodities and transactions not classified elsewhere," all of the classifications have either remained stable or fallen.

The method used to choose sectors in this third update is similar to that used in the second update. In the previous update, significant tariff restraints, or peak tariffs, were identified using the SIC 4-digit aggregation of trade and tariff data. In this study, however, peak tariffs are identified employing the aggregation used for the USDOC, BEA input-output table for the U.S. economy.[1] While the SIC and BEA aggregations are similar, they are not identical. To identify the peak tariffs, the first step is to calculate the trade-weighted average tariff by BEA sector.[2] The peak tariffs are then identified as those sectors with a tariff more than one standard deviation (3.34 percent) above the simple average of the BEA aggregate tariffs (1.71 percent), that is, 5.05 percent or above. Those sectors that are discussed elsewhere

[1] The USITC model is based on the BEA input-output table, using the same industry/product aggregation.

[2] The average tariff is constructed by dividing the calculated duties for the model sector by the c.i.f. value of imports for consumption in that sector. The c.i.f. value is used because the USITC model treats tariffs as applied to the c.i.f. value of imports.

Table 6-1
Effective U.S. tariff rates[1] by 1-digit Standard Industrial Trade Classification Sectors, 1992-2000

Sector	1992	1993	1994	1995	1996	1997	1998	1999	2000
0 Food and live animals	1.99	2.07	1.81	1.42	1.41	1.19	1.34	1.36	1.18
1 Beverages and tobacco	3.33	3.66	2.71	1.76	1.90	2.04	1.10	1.21	0.95
2 Crude materials, inedible, except fuels	0.36	0.36	0.32	0.24	0.21	0.20	0.20	0.16	0.16
3 Mineral fuels, lubricants and related materials	0.47	0.48	0.50	0.42	0.35	0.32	0.42	0.35	0.20
4 Animal and vegetable oils, fats and waxes	1.05	1.19	0.91	0.64	0.53	0.70	0.84	0.76	1.05
5 Chemicals and related products, n.e.s.	3.64	3.95	3.81	2.23	1.93	1.73	1.56	1.24	1.03
6 Manufactured goods classified chiefly by material	3.47	3.31	3.16	2.71	2.56	2.42	2.14	1.91	1.76
7 Machinery and transport equipment	2.00	2.02	1.86	1.53	1.35	1.14	0.94	0.85	0.73
8 Miscellaneous manufactured articles	8.41	7.81	7.70	6.86	6.45	6.18	5.88	5.54	5.49
9 Commodities and transactions not classified elsewhere in the SITC	0.02	0.03	0.03	0.05	0.07	0.06	0.10	0.09	0.03
All sectors	3.15	3.07	2.91	2.43	2.20	2.07	1.95	1.76	1.59

[1] The effective tariff rates are constructed by dividing the level of calculated duties by the c.i.f. value of imports at the SITC 1-digit level.

Source: USDOC.

in this study–such as textiles and apparel–are then excluded, leaving a list of seven sectors and sectoral groupings as found in table 6-2. Certain related sectors have been grouped together for analytical purposes, although each of the group components qualifies on its own as a sector subject to a peak tariff (see table 6-2). For certain analyses in this chapter, the impact on select upstream sectors is also identified.[3]

Table 6-2
Model sectors with the highest effective tariff rates not discussed elsewhere in this study

BEA No.	Description	Average tariff rate based on C.i.f. value[1]	Average tariff rate based on Customs value[2]	Tariff revenue
		Percent		*Million dollars*
14.1301	Frozen fruits, fruit juices and vegetables	7.8	8.4	110.3
([3])	Footwear	10.7	11.2	1,529.0
36.0300	Ceramic wall and floor tile	11.4	13.4	136.3
([4])	Table and kitchenware	7.0	7.7	56.9
49.0200	Ball and roller bearings	6.0	6.2	88.5
62.0700	Watches, clocks, watchcases, and parts	5.3	5.4	161.5
64.0105	Costume jewelry	6.3	6.7	45.3

[1] Calculated duties divided by c.i.f. imports.
[2] Calculated duties divided by customs value imports.
[3] The following sectors are included: rubber and plastics footwear (BEA 32.0200); shoes, except rubber (BEA 34.0201); and house slippers (BEA 34.0202).
[4] The following sectors are included: vitreous china table and kitchenware (BEA 36.0701); and fine earthenware table and kitchenware (BEA 36.0702).

Sources: USDOC and USITC calculations.

Economic Effects of Removing Significant Tariff Restraints

In order to assess the probable impact of tariff liberalization, the USITC CGE model is employed to simulate the removal of each individual peak tariff. The impact on employment, output, imports, exports, and the real price paid are reported next. Two separate measures of economywide labor impact are

[3] Select upstream sectors are identified by looking at two numbers derived from the input-output matrix of the model: the relative proportion of the upstream sector in the input demand of the downstream sector, and the market share that the downstream sector represents to the upstream industry. Those upstream/downstream pairs that exhibit relatively high proportions are then broken out separately in the model results.

used–displacement and labor force expansion/contraction. A displaced worker is one who may move from one sector to another. Thus, there can be considerable worker displacement with no change in total employment. For example, if employment in only two sectors were affected in a liberalization, with one increasing by 1,000 FTE jobs and the other declining by 300 FTEs, the analysis would conclude that the labor force expanded by 700 FTE positions, while 300 workers were displaced.

To maintain comparability between the various liberalization scenarios, the same model specification, sectoral aggregation, and database are employed for each simulation; only the liberalization experiment varies. When presenting results, those sectors relevant to the particular simulation are listed, while the remaining sectors of the economy are aggregated into broad categories. The underlying CGE model, however, remains the same, using the same database with the same aggregation throughout this chapter and study.

All aggregation for expository purposes is performed after the model has been solved for the liberalization in question. This post-solution aggregation method has a particular impact on the calculations of total worker displacements across the whole economy. The calculation of the total number of displaced FTE workers is performed on the disaggregated model data, before any post-solution aggregation is performed. The post-solution aggregations presented in upcoming tables may mask some of these displaced workers. Some sectors facing net job losses might be combined with other sectors experiencing employment growth, yielding an aggregate sector showing growing demand for labor. The degree to which such masking occurs can be seen in the difference between reported total displacements and the sum of all negative FTE employment changes reported in each economic effects table.

Anticipated Effects of Liberalization

Liberalization is typically expected to lead to a certain number of changes in the economy. First, the real composite price of the liberalized good typically decreases, as the real price of the imported good falls in response to the tariff reduction. Second, domestic output contracts as the real price is driven down, and domestic producers are less willing to supply to the market. Third, imports rise as more imported goods are sold in the market to satisfy the increased consumer demand brought about by declining prices. Foreign producers are willing to satisfy this increased demand because the real price they receive increases with the removal of the tariff.[4]

[4] The degree to which each of these market responses is observed depends upon the behavioral parameters of the model: the price elasticity of demand for the product in question, the degree to which imports are substitutes for the domestic variety, and the responsiveness of domestic and foreign producers to changes in market prices, for example.

In the labor market, employment in the liberalizing sector typically falls in percentage terms by about the same amount that output falls. Upstream suppliers to the contracting industry also may face contraction, although the percentage response can be much more muted than that of the liberalized sector. The economywide wage rate rises as factors of production are allocated to more productive purposes. This increase typically draws in additional labor, muting the wage response compared to what can be observed in a model with no labor supply response. The overall impact of tariff liberalization on the economy's net welfare is expected to be positive, although the net result can be negative under certain conditions.[5]

Frozen Fruits, Fruit Juices, and Vegetables

The frozen fruits, fruit juices, and vegetables industry produces fruit juice concentrates, dried citrus pulp, and quick-frozen and cold-pack fruits and vegetables. Import penetration in the sector was about 15.6 percent in 1999.[6] The 1999 effective tariff rates for frozen fruits, fruit juices, and vegetables were 7.8 percent ad valorem for c.i.f. value and 8.4 percent ad valorem on customs value. These rates represent a slight decline from levels observed in the previous study.[7] Summary data for the sector are presented in table 6-3.

Table 6-3
Frozen fruits, fruit juices, and vegetables: Summary data, 1997-99

Item	1997	1998	1999
Shipments *(million dollars)*	9,549.3	9,862.5	9,382.2
Employment *(1,000 workers)*	46.3	49.5	44.5
Imports *(million dollars)*	1,349.1	1,254.1	1,499.5
Exports *(million dollars)*	1,193.9	1,212.0	1,285.9

Source: Shipment and employment data from USDOC, Bureau of the Census (NAIC311411); imports and exports from USDOC official statistics (SIC2037).

Economic Effects of Tariff Removal

Removal of tariffs on frozen fruits, fruit juices, and vegetables is estimated to lead to a net increase in welfare of $11 million. Economywide worker displacement is calculated to total 2,270 FTE jobs, while 540 FTE workers are drawn into the workforce because of a modest increase in wages.[8] The simulation results in table 6-4 are consistent with the standard

[5] The change in welfare from liberalization depends on the current level of protection as well as other benchmark distortions.

[6] USITC estimates based on official data from the USDOC.

[7] In 1996, the effective tariff rates were 8.3 percent ad valorem on a c.i.f. basis and 8.9 percent on a customs basis.

[8] The negative FTE employment change entries in table 6-4 total to 2,260, not 2,270. The difference is due to the post-solution aggregation, discussed in the "Economic Effects of Removing Significant Tariff Restraints" section, pp. 6-3, 6-4.

Table 6-4
Frozen fruits, fruit juices and vegetables: Economic effects of tariff removal, changes from benchmark, 1999

Sector	Employment		Output		Imports		Exports		Composite price
	FTE	*Percent*	*Value*[1]	*Percent*	*Value*[1]	*Percent*	*Value*[1]	*Percent*	*Percent*
Liberalized sector:									
Frozen fruits, fruit juices and vegetables	-1,690	-4.1	-367	-4.1	322	22.8	-36	-3.3	-1.3
Upstream sectors:									
Fruits and vegetables	-280	-0.1	-29	-0.1	-13	-0.2	-3	-0.1	(2)
Packaging	-160	-0.1	-36	-0.1	-1	-0.1	-1	-0.1	(2)
Rest of the U.S. economy:									
Agriculture, forestry, and fisheries	80	(2)	16	(2)	-2	(2)	7	(2)	(2)
Mining	50	(2)	15	(2)	-8	(2)	1	(2)	(2)
Construction	70	(2)	(3)	(2)	(3)	(2)	(3)	(2)	(2)
Nondurable manufacturing	360	(2)	53	(2)	-43	(2)	11	(2)	(2)
Durable manufacturing	1,290	(2)	296	(2)	-140	(2)	75	(2)	(2)
Transportation, communications, and utilities	120	(2)	7	(2)	-24	(2)	11	(2)	(2)
Wholesale trade	-130	(2)	-34	(2)	(3)	(2)	8	(2)	(2)
Finance, insurance, and real estate	80	(2)	(3)	(2)	-3	(2)	3	(2)	(2)
Other services	760	(2)	11	(2)	-7	(2)	6	(2)	(2)

[1] In millions of dollars in base year prices.
[2] Less than 0.05 percent in absolute value.
[3] Change less than $500,000 in absolute value or nontraded sector.

Source: USITC estimates.

expectations of the model, with the possible exception of the modest contraction of the wholesale trade sector. Because of the contraction of the liberalized sector and the upstream supply of fruits and vegetables, however, the overall demand for wholesaling services might be expected to fall as a result of the liberalization.

Footwear

The footwear category includes three sectors from the BEA aggregation: rubber and plastics footwear (BEA 32.0200); shoes, except rubber (BEA 34.0201); and house slippers (BEA 34.0202).[9] Imports in these sectors face high, though somewhat varied, tariffs. While the c.i.f.-based tariff rate on rubber and plastics footwear imports is about 15 percent ad valorem, the rates are lower for other shoes at 8.5 percent and for house slippers at 9.4 percent.[10] The trade-weighted average tariff across all three BEA sectors is 10.7 percent based on c.i.f. value. Summary data for the sector are presented in table 6-5.

Table 6-5
Footwear: Summary data, 1997-99

Item	1997	1998	1999
Shipments *(million dollars)*	4,200	3,760	3,770
Employment *(1,000 workers)*	40	35	31
Imports *(million dollars)*	13,372	13,345	13,628
Exports *(million dollars)*	465	422	391

Source: Shipments estimated by USITC. Data for employment, imports, and exports were compiled from USDOC official statistics.

Economic Effects of Tariff Removal

Removal of the tariff on footwear is estimated to increase net welfare by $109 million. Modeling also suggests that such a liberalization would lead to substantial shifts in employment by industry (see table 6-6). While the footwear industry is anticipated to lose 1,510 FTE jobs, the overall

[9] For comparability to the previous study, BEA category 32.0200 corresponds to SIC category 3021 (rubber and plastics footwear); BEA category 34.0201 corresponds to SIC categories 3143 (men's footwear, except athletic), 3144 (women's footwear, except athletic), and 3149 (footwear, except rubber, not elsewhere classified); and BEA category 34.0202 corresponds to SIC category 3142 (house slippers).

[10] USITC calculations.

Table 6-6
Footwear: Economic effects of tariff removal, changefrom benchmark, 1999

Sector	Employment		Output		Imports		Exports		Composite price
	FTE	*Percent*	*Value*[1]	*Percent*	*Value*[1]	*Percent*	*Value*[1]	*Percent*	*Percent*
Liberalized sector:									
Footwear	-1,510	-4.0	-206	-4.0	994	7.0	-10	-2.5	-7.3
Upstream sector:									
Leather tanning and finishing	-330	-1.5	-43	-1.5	-23	-1.6	-16	-1.4	(2)
Rest of the U.S. economy:									
Agriculture, forestry, and fisheries	150	(2)	19	(2)	-9	-0.1	16	0.1	(2)
Mining	170	(2)	49	(2)	-22	-0.1	3	0.1	(2)
Construction	250	(2)	3	(2)	(3)	(2)	(3)	(2)	(2)
Nondurable manufacturing	1,270	(2)	135	(2)	-122	-0.1	40	(2)	(2)
Durable manufacturing	4,130	(2)	935	(2)	-402	-0.1	232	0.1	(2)
Transportation, communications, and utilities	1,000	(2)	110	(2)	-62	-0.1	36	0.1	(2)
Wholesale trade	1,290	(2)	19	(2)	(3)	(2)	28	(2)	(2)
Finance, insurance, and real estate	160	(2)	-115	(2)	-9	-0.1	7	(2)	(2)
Other services	1,090	(2)	-78	(2)	-20	(2)	13	(2)	(2)

[1] In millions of dollars in base year prices.
[2] Less than 0.05 percent in absolute value.
[3] Change less than $500,000 in absolute value or nontraded sector.

Source: USITC estimates.

economy is expected to see total displacements of 1,900 workers and an influx of an additional 7,670 FTE jobs.[11]

Ceramic Wall and Floor Tile

Products in this sector include ceramic wall and floor tiles, glazed and unglazed mosaic and nonmosaic tiles. Summary data for the sector are presented in table 6-7. The data indicate that this sector faces significant import competition, since 55 percent of domestic absorption[12] is satisfied by imports. U.S. exports of ceramic wall and floor tile represent only a small portion (2.8 percent in 1999) of production. The sector currently has a 13.4 percent tariff based on customs value and 11.4 percent based on c.i.f. value (see table 6-2).

Table 6-7
Ceramic wall and floor tile: Summary data, 1997-99

Item	1997	1998	1999
Shipments *(million dollars)*	830	837	843
Employment *(1,000 workers)*	9.2	9.2	9.2
Imports *(million dollars)*	715.6	860.3	1,019.3
Exports *(million dollars)*	28.9	26.6	23.9

Source: Shipments data from USDOC, Bureau of the Census, *Clay Construction Products*, Current Industrial Reports; employment data estimated by USITC from Bureau of the Census, *Annual Survey of Manufactures 1996,* M96(AS)-1, issued February 1998, found at www.census.gov/prod/3/98pubs/m96-as1.pdf; imports and exports are compiled from USDOC official statistics.

Economic Effects of Tariff Removal

Removal of tariffs on ceramic wall and floor tile is expected to lead to an increase of $3 million in net welfare. Economywide employment is expected to remain flat (see table 6-8). Job displacements are estimated to be 960 FTEs, equal to the FTE losses in the liberalized sector and in the upstream sector.

[11] Note that the only negative entries in table 6-6 are for the liberalized sector and for the upstream sector, and that these total to 4,670 FTE jobs. The additional 180 FTE job displacements are due to the post-solution aggregation, discussed in the "Economic Effects of Removing Significant Tariff Restraints" section, pp. 6-3, 6-4.

[12] Domestic absorption is the measure of both intermediate and final demand for a product. It can be calculated from table 6-7 by adding shipments and imports and subtracting exports.

Table 6-8
Ceramic wall and floor tile: Economic effects of tariff removal, change from benchmark, 1999

Sector	Employment		Output		Imports		Exports		Compositeprice
	FTE	*Percent*	*Value*[1]	*Percent*	*Value*[1]	*Percent*	*Value*[1]	*Percent*	*Percent*
Liberalized sector:									
Ceramic wall and floor tile	-930	-11.5	-80	-11.5	73	6.0	-3	-11.1	-6.9
Upstream sector:									
Clay, ceramic, and refractory minerals mining	-30	-0.2	-6	-0.2	([3])	-0.1	-2	-0.2	([2])
Rest of the U.S. economy:									
Agriculture, forestry, and fisheries	20	([2])	3	([2])	-1	([2])	1	([2])	([2])
Mining	10	([2])	2	([2])	-2	([2])	([3])	([2])	([2])
Construction	20	([2])	([3])	([2])	([3])	([2])	([3])	([2])	([2])
Nondurable manufacturing	130	([2])	16	([2])	-9	([2])	4	([2])	([2])
Durable manufacturing	320	([2])	70	([2])	-30	([2])	17	([2])	([2])
Transportation, communications, and utilities	10	([2])	-5	([2])	-6	([2])	2	([2])	([2])
Wholesale trade	150	([2])	4	([2])	([3])	([2])	2	([2])	([2])
Finance, insurance, and real estate	40	([2])	4	([2])	-1	([2])	1	([2])	([2])
Other services	270	([2])	5	([2])	-1	([2])	1	([2])	([2])

[1] In millions of dollars in base year prices.
[2] Less than 0.05 percent in absolute value.
[3] Change less than $500,000 in absolute value or nontraded sector.

Source: USITC estimates.

Table and Kitchenware

Table and kitchenware is a composite of two BEA sectors: vitreous china table and kitchenware (BEA 36.0701) and fine earthenware table and kitchenware (BEA 36.0702). This combined sector consists of products manufactured from either vitreous china or fine (semivitreous) earthenware for use in households, hotels, restaurants and other commercial institutions for preparing, serving, or storing food or drink. Summary data for the composite sector are listed in table 6-9. The effective tariff rate for the composite sector is 7.7 percent based on customs value and 7.0 percent based on c.i.f. value (see table 6-2).

Table 6-9
Table and kitchenware: Summary data, 1997-99

Item	1997	1998	1999
Shipments *(million dollars)*	418.6	421.3	418.8
Employment *(1,000 workers)*	([1])	([1])	[2]5.8
Imports *(million dollars)*	296	313	299
Exports *(million dollars)*	43	42	56

[1] Not available.
[2] Based on USITC U.S. model database.

Source: Compiled from USDOC official statistics.

Economic Effects of Tariff Removal

Removal of the tariffs on table and kitchenware is expected to lead to a net increase in welfare of $5 million. Economywide employment is expected to increase by 190 FTE jobs, while displacements are anticipated to total 530 FTE jobs in the liberalized grouping and the upstream sector. Detailed results are given in table 6-10.

Table 6-10
Table and kitchenware: Economic effects of tariff removal, change from benchmark, 1999

Sector	Employment		Output		Imports		Exports		Composite price
	FTE	*Percent*	*Value*[1]	*Percent*	*Value*[1]	*Percent*	*Value*[1]	*Percent*	*Percent*
Liberalized sector:									
Table and kitchenware	-520	-8.8	-50	-8.8	51	6.3	-5	-8.5	-4.3
Upstream sector:									
Clay, ceramic, and refractory minerals mining	-10	-0.1	-3	-0.1	([3])	([2])	-1	-0.1	([2])
Rest of the U.S. economy:									
Agriculture, forestry, and fisheries	10	([2])	2	([2])	([3])	([2])	1	([2])	([2])
Mining	([4])	([2])	2	([2])	-1	([2])	([3])	([2])	([2])
Construction	([4])	([2])	-1	([2])	([3])	([2])	([3])	([2])	([2])
Nondurable manufacturing	100	([2])	14	([2])	-6	([2])	3	([2])	([2])
Durable manufacturing	230	([2])	54	([2])	-21	([2])	13	([2])	([2])
Transportation, communications, and utilities	30	([2])	2	([2])	-4	([2])	2	([2])	([2])
Wholesale trade	110	([2])	6	([2])	([3])	([2])	2	([2])	([2])
Finance, insurance, and real estate	30	([2])	([3])	([2])	([3])	([2])	([3])	([2])	([2])
Other services	210	([2])	11	([2])	-1	([2])	2	([2])	([2])

[1] In millions of dollars in base year prices.
[2] Less than 0.05 percent in absolute value.
[3] Change less than $500,000 in absolute value or nontraded sector.
[4] Fewer than 5 FTE positions.

Source: USITC estimates.

Ball and Roller Bearings

Ball and roller bearings are used to reduce friction between moving and fixed parts in machinery, such as motor vehicles, farm implements, material-handling equipment, motors, pumps, compressors, home appliances, and aircraft engines. The ad valorem tariff rate is 6 percent based on c.i.f. value and 6.2 percent based on customs value (see table 6-2). Summary data are presented in table 6-11.

Table 6-11
Ball and roller bearings: Summary data, 1997-99

Item	1997	1998	1999
Shipments *(million dollars)*	5,723.1	5,488.0	5,205.4
Employment *(1,000 workers)*	36.8	36.8	36.7
Imports *(million dollars)*	1,615.1	1,719.3	1,621.9
Exports *(million dollars)*	1,139.8	1,141.0	1,098.1

Source: Shipments: USDOC, Bureau of the Census, *Antifriction Bearings*, Current Industrial Reports, MA332Q(99)-1, issued September 2000; employment: 1997 data from USDOC, Bureau of the Census, *Ball and Roller Bearing Manufacturing*, 1997 Economic Census, EC97M-3329E, issued August 1999, and 1998-99 data estimated by USITC; imports and exports compiled from USDOC official statistics.

Economic Effects of Tariff Removal

After removal of tariffs on ball and roller bearings, the Commission estimates that net welfare increases by $10 million. Total employment in the economy is anticipated to remain basically flat, increasing by 80 FTE jobs, while total displacements are estimated to be 1,000 FTE jobs (see table 6-12). All anticipated displacements are in the ball and roller bearings sector. The response of the composite price of ball and roller bearings to the removal of the tariff is relatively modest, falling only 1.1 percent.

Table 6-12
Ball and roller bearings: Economic effects of tariff removal, change from benchmark, 1999

Sector	Employment		Output		Imports		Exports		Composite price
	FTE	*Percent*	*Value*[1]	*Percent*	*Value*[1]	*Percent*	*Value*[1]	*Percent*	*Percent*
Liberalized sector:									
Ball and roller bearings	-1,000	-1.7	-164	-1.7	124	8.5	-16	-1.6	-1.1
Rest of the U.S. economy:									
Agriculture, forestry, and fisheries	10	(2)	2	(2)	(3)	(2)	1	(2)	(2)
Mining	20	(2)	5	(2)	-1	(2)	1	(2)	(2)
Construction	(4)	(2)	(3)	(2)	(3)	(2)	(3)	(2)	(2)
Nondurable manufacturing	120	(2)	21	(2)	-4	(2)	4	(2)	(2)
Durable manufacturing	590	(2)	149	(2)	-70	(2)	37	(2)	(2)
Transportation, communications, and utilities	150	(2)	26	(2)	-5	(2)	9	(2)	(2)
Wholesale trade	50	(2)	3	(2)	(3)	(2)	1	(2)	(2)
Finance, insurance, and real estate	20	(2)	(3)	(2)	(3)	(2)	(3)	(2)	(2)
Other services	120	(2)	8	(2)	-1	(2)	1	(2)	(2)

[1] In millions of dollars in base year prices.
[2] Less than 0.05 percent in absolute value.
[3] Change less than $500,000 in absolute value or nontraded sector.
[4] Fewer than 5 FTE positions.

Source: USITC estimates.

Watches, Clocks, Watchcases, and Parts

This sector consists of clocks (including electric), watches, watchcases, mechanisms for clockwork operated devices, and clock and watch parts, with the exception of crystals (either plastic or glass) and jewels. Table 6-13 lists summary statistics of the sector. Imports dominate this sector, representing 80 percent of domestic absorption. The sector does have relatively more success in exports than many other sectors analyzed in this chapter, with 30 percent of shipments exported in 1999. The ad valorem tariff rate is 5.3 percent based on c.i.f. value and 5.4 percent based on customs value (see table 6-2).

Table 6-13
Watches, clocks, watchcases, and parts: Summary data, 1997-99

Item	1997	1998	1999
Shipments *(million dollars)*	921.8	1,020.8	1,103.2
Employment *(1,000 workers)*	6.3	6.5	6.3
Imports *(million dollars)*	2,758.2	3,100.0	3,136.0
Exports *(million dollars)*	309.3	311.3	335.0

Source: Shipments and employment from USDOC, U.S. Census Bureau, Annual Survey of Manufactures, 1999; imports and exports compiled from USDOC official statistics.

Economic Effects of Tariff Removal

Removal of tariffs on watches, clocks, watchcases and parts is estimated to lead to an increase in net welfare of $10 million. Economywide displacements are estimated at 180 FTE jobs, while employment as a whole is expected to expand by 740 FTE positions as a result of a modest rise in the wage rate (see table 6-14).

Table 6-14
Watches, clocks, watchcases, and parts: Economic effects of tariff removal, change from benchmark, 1999

Sector	Employment		Output		Imports		Exports		Composite price
	FTE	*Percent*	*Value*[1]	*Percent*	*Value*[1]	*Percent*	*Value*[1]	*Percent*	*Percent*
Liberalized sector:									
Watches, clocks, watchcases, and parts	-150	-3.5	-28	-3.5	116	3.8	-9	-3.1	-4.5
Rest of the U.S. economy:									
Agriculture, forestry, and fisheries	20	(2)	3	(2)	-1	(2)	2	(2)	(2)
Mining	20	(2)	6	(2)	-3	(2)	(3)	(2)	(2)
Construction	30	(2)	(3)	(2)	(3)	(2)	(3)	(2)	(2)
Nondurable manufacturing	160	(2)	20	(2)	-14	(2)	5	(2)	(2)
Durable manufacturing	500	(2)	116	(2)	-53	(2)	28	(2)	(2)
Transportation, communications, and utilities	100	(2)	12	(2)	-7	(2)	4	(2)	(2)
Wholesale trade	80	(2)	-2	(2)	(3)	(2)	3	(2)	(2)
Finance, insurance, and real estate	-10	(2)	-19	(2)	-1	(2)	1	(2)	(2)
Other services	-20	(2)	-18	(2)	-2	(2)	1	(2)	(2)

[1] In millions of dollars in base year prices.
[2] Less than 0.05 percent in absolute value.
[3] Change less than $500,000 in absolute value or nontraded sector.

Source: USITC estimates.

Costume Jewelry

Costume jewelry includes costume novelties and ornaments made of all materials, except precious metal, precious or semiprecious stones, or rolled goldplate or gold-filled materials. These items include compacts, cuff-links, artificial pearls, watchbands made of base metal, and rosaries and other small religious articles. Table 6-15 lists summary data for the sector. Imports represented about 34 percent of domestic absorption in 1999, while U.S. exports of costume jewelry were about 11 percent of shipments.

Table 6-15
Costume jewelry: Summary data, 1997-99

Item	1997	1998	1999
Shipments *(million dollars)*	1,230	1,185	1,180
Employment *(1,000 workers)*	13	12	12
Imports *(million dollars)*	464	493	546
Exports *(million dollars)*	136	128	133

Source: Shipments and employment from USITC, *Shifts in U.S. Merchandise Trade 2000*, publication No. 3436, July 2001, table C-10; imports and exports compiled from USDOC official statistics.

Economic Effects of Tariff Removal

Removal of tariffs on costume jewelry is estimated to lead to an increase in net welfare of $3 million. Economywide displacement of workers is estimated to be 60 FTE jobs (see table 6-16). Overall employment in the economy also is expected to expand by 230 FTE jobs; a slight increase in wages is expected to draw additional workers into the labor force.

Table 6-16
Costume jewelry: Economic effects of tariff removal, change from benchmark, 1999

Sector	Employment		Output		Imports		Exports		Composite price
	FTE	*Percent*	*Value*[1]	*Percent*	*Value*[1]	*Percent*	*Value*[1]	*Percent*	*Percent*
Liberalized sector:									
Costume jewelry	-40	-0.6	-9	-0.6	40	5.7	-1	-0.5	-1.9
Rest of the U.S. economy:									
Agriculture, forestry, and fisheries	10	(2)	1	(2)	(3)	(2)	1	(2)	(2)
Mining	10	(2)	2	(2)	-1	(2)	(3)	(2)	(2)
Construction	10	(2)	(3)	(2)	(3)	(2)	(3)	(2)	(2)
Nondurable manufacturing	60	(2)	8	(2)	-5	(2)	2	(2)	(2)
Durable manufacturing	140	(2)	34	(2)	-17	(2)	9	(2)	(2)
Transportation, communications, and utilities	30	(2)	5	(2)	-3	(2)	1	(2)	(2)
Wholesale trade	30	(2)	(3)	(2)	(3)	(2)	1	(2)	(2)
Finance, insurance, and real estate	(4)	(2)	-6	(2)	(3)	(2)	(3)	(2)	(2)
Other services	-10	(2)	-5	(2)	-1	(2)	(3)	(2)	(2)

[1] In millions of dollars in base year prices.
[2] Less than 0.05 percent in absolute value.
[3] Change less than $500,000 in absolute value or nontraded sector.
[4] Fewer than 5 FTE positions.

Source: USITC estimates.

Simultaneous Removal of All Significant Tariffs

As a final exercise, the Commission calculated the probable economic effects of simultaneously removing tariffs on the seven sectors and groupings identified in this chapter. The results of this simulation are presented in table 6-17. Simultaneous removal of tariffs on the seven product groupings is expected to lead to a $152 million rise in net welfare for the U.S. economy. Commission calculations indicate that employment displacements are expected to total 6,450 FTE jobs, while an additional 9,450 FTE workers are drawn into the workforce in response to a modest rise in wages. The individual results of the focus sectors are generally consistent with the results reported in the single-grouping liberalizations.

Table 6-17
All significant tariffs: Economic effects of tariff removal, change from benchmark, 1999

Sector	Employment		Output		Imports		Exports		Composite price
	FTE	*Percent*	*Value*[1]	*Percent*	*Value*[1]	*Percent*	*Value*[1]	*Percent*	*Percent*
Liberalized sectors:									
Frozen fruits, fruit juices and vegetables	-1,670	-4.1	-364	-4.1	319	22.6	-36	-3.3	-1.3
Footwear	-1,510	-3.9	-206	-4.0	992	6.9	-9	-2.4	-7.3
Ceramic wall and floor tile	-930	-11.5	-79	-11.5	72	6.0	-3	-11.0	-6.9
Table and kitchenware	-510	-8.7	-50	-8.8	50	6.2	-5	-8.4	-4.2
Ball and roller bearings	-960	-1.7	-158	-1.7	124	8.4	-15	-1.5	-1.0
Watches, clocks, watchcases, and parts	-150	-3.4	-28	-3.4	115	3.8	-9	-3.0	-4.4
Costume jewelry	-40	-0.6	-9	-0.6	40	5.6	-1	-0.5	-1.9
Upstream sectors:									
Fruits and vegetables	-170	-0.1	-21	-0.1	-20	-0.2	([3])	([2])	([2])
Packaging	-140	-0.1	-33	-0.1	-2	-0.2	-1	-0.1	([2])
Leather tanning and finishing	-320	-1.5	-41	-1.5	-23	-1.6	-15	-1.3	([2])
Clay, ceramic, and refractory minerals	-30	-0.3	-7	-0.3	([3])	-0.1	-2	-0.3	([2])
Rest of the U.S. economy:									
Agriculture, forestry, and fisheries	310	([2])	47	([2])	-14	-0.1	29	0.1	([2])
Mining	260	0.1	79	([2])	-38	-0.1	4	0.1	([2])
Construction	380	([2])	2	([2])	([3])	([2])	([3])	([2])	([2])
Nondurable manufacturing	2,020	([2])	250	([2])	-188	-0.1	63	([2])	([2])
Durable manufacturing	7,160	0.1	1647	0.1	-731	-0.1	411	0.1	([2])
Transportation, communications, and utilities	1,440	([2])	156	([2])	-112	-0.1	65	0.1	([2])

Rest of the U.S. economy—*Continued*:									
Wholesale trade	1,570	(2)	-3	(2)	(3)	(2)	45	0.1	(2)
Finance, insurance, and real estate	320	(2)	-135	(2)	-15	-0.1	12	0.1	(2)
Other services	2,420	(2)	-66	(2)	-33	-0.1	25	(2)	(2)

[1] In millions of dollars in base year prices.

[2] Less than 0.05 percent in absolute value.

[3] Change less than $500,000 in absolute value or nontraded sector.

Source: USITC estimates.

CHAPTER 7
Special Focus On Labor Transitions

Summary of Findings

The USITC model results in Chapter 2 showed that if all significant U.S. import restraints had been unilaterally removed in 1999, approximately 175,000 FTE workers would be displaced from their current industries and would need to seek employment in industries other than those being liberalized. Approximately 155,000 of these FTE workers would be in the textile and apparel sectors. Based on the experience of similar workers surveyed for the U.S. Department of Labor's (USDOL) Bureau of Labor Statistics, the estimated one-time increase in workers receiving unemployment compensation as a result of removing all significant import restraints is approximately 111,000, equal to about two days' worth of new claims. This estimate takes into account the fact that workers in the affected industries are significantly more likely to receive unemployment insurance. Overall, the measurable effect on aggregate U.S. unemployment of removing all significant U.S. import restraints on a phased-in basis, rather than simultaneously, likely would be too small to measure. About 17,000 net additional FTE workers would be drawn into the labor market nationwide as a result of removing all significant import restraints. Local and regional employment effects may differ, as discussed below.

Potential transition costs of concern to policymakers include lost income during spells of unemployment, unemployment insurance and other transitional assistance, and potential loss of the value of training and experience for workers who switch industries. On average, workers displaced as a result of unilateral U.S. liberalization of all significant import restraints likely would experience longer spells of unemployment than other displaced workers. They would likely receive modestly higher wages in their new jobs than in the jobs they were displaced from, though these increases likely would be less than for other displaced workers economywide. Approximately 10 percent of workers displaced due to unilateral liberalization of all U.S. import restraints likely would experience severe wage decreases, defined as wage cuts of more than 20 percent in their new jobs. The estimated percentage of such workers experiencing severe wage decreases would be lower than that for displaced workers economywide.

The workers who would be displaced in the event of unilateral trade liberalization likely would be concentrated in the Southeast, particularly in the

Carolinas, due largely to the high share of apparel and textile workers among such workers. Relative to other displaced workers economywide, they would more likely be female, belong to minority groups, be older, less educated, and less likely to move after displacement. They would be more likely to leave the labor force after displacement, in part because of the higher proportion of female workers in textiles and apparel and the lower degree of attachment of female workers to the labor force.

Introduction

Chapter 2 presents the results of a modeling exercise designed to estimate the effects of the removal of certain trade barriers in 1999. The estimates indicated that approximately 175,000 net FTE workers would leave employment in one sector and be re-employed in a different sector as a result of the trade liberalization. In addition, an estimated net 17,000 additional jobs would be created due to macroeconomic effects.[1]

This chapter seeks to round out the picture provided by previous chapters by focusing on the experience of workers who undergo displacement. It begins by reviewing both the theoretical and empirical literature on the effects of trade liberalization on markets. Under certain assumptions, trade theory makes strong predictions about the relationship between trade and wages, some of which have entered popular discourse on public policy. Until recently, much of the empirical literature has focused on the extent to which international trade affects the average relative wages of skilled and unskilled workers. The availability of large datasets on workers and households affected by involuntary job losses has significantly increased available knowledge of the characteristics of such transitions.

This chapter examines the implications of the modeling results presented in Chapter 2 for the experience of displaced workers. The analysis includes the demographic and geographic characteristics of workers most likely to be displaced by simultaneous removal of all significant U.S. import restraints, the length of time it takes such workers displaced by trade liberalization to find new jobs, the kind and quality of jobs they find, and how the experience of workers affected by potential future liberalization might compare to that of other displaced workers.

Regardless of whether the movement of workers from one sector to another takes place instantaneously, or in a timeless "long run," from the standpoint of the model it takes place without cost to workers or society. In reality, there are a variety of costs experienced by workers who are displaced from one sector to another:

[1] If the economy were to actually undergo a net contraction of employment of 175,000 FTE jobs in the sectors with significant U.S. import restraints, the gross movement of workers could potentially be larger. A similar observation holds for the net increase of 17,000 FTE jobs economywide.

- Workers experience drops in income during the time they are searching for a new job. These costs are only partially compensated by unemployment insurance or other government programs. The longer the job search, the greater are these costs, and unemployment insurance runs out eventually (usually after 26 weeks). Government expenditures that partially compensate some workers for their job search costs represent non-trivial redistributions within society, if not net social costs.

- Job displacement due to industrial restructuring is often concentrated in certain geographical areas and communities, creating special burdens of adjustment.

- Workers who are eventually re-employed may receive higher or lower compensation than in their previous jobs, thus either offsetting or adding to the burdens imposed during the transition period.

- As a result of being displaced, some workers may leave the labor force due to early retirement, return to homemaking or student status, or simply become discouraged. In the absence of job displacement, workers might not make these choices. Workers may choose to postpone or avoid such changes altogether.[2]

This chapter makes no attempt to directly estimate the total costs of potential worker displacement associated with a simultaneous removal of all significant U.S. import restraints, or to weigh the various costs and benefits of such liberalization. Instead, the examination of the transition experiences of displaced workers aims to shed some light on the nature of such costs. The potential limitations both of the scope of the analysis and of the analytical methods used are indicated throughout the chapter, as appropriate.

Review of Literature

The analysis in this chapter of the relationship between trade policy and employment or wages relies heavily on data describing the experiences of individual workers over short periods of time. The body of literature utilizing such data is relatively small, and provides a different perspective from the more common ways of discussing the relationship between trade and labor, from the standpoints of either economic theory or empirical generalization. This section first reviews the traditional theoretical and empirical analysis of trade and labor, and then turns to those studies of displacement of individual workers in trade-sensitive industries, which provide the closest parallels to the present study.

[2] By contrast, the model estimates only the net change in FTE employment economywide and sector-by-sector, and thus generates no estimates of the number of workers leaving the labor force as the result of a policy change. In addition, the model assumes that all workers in the U.S. economy receive the same increase or decrease in their real wages. This assumption likely would not be validated in the effect of an actual liberalization.

Trade Theory and Wages

The best-known statements from trade theory about wages come from the Heckscher-Ohlin (H-O) model, a widely-used workhorse of academic theory.[3] This model, in its simplest form, describes a situation with two countries, two goods, and two factors or inputs into the production process. The two factors are usually described as labor and capital, and can also be usefully thought of as *skilled labor* and *unskilled labor*. One result of this model, the Factor-Price Equalization Theorem, states that if countries that share the same technology engage in international trade, and if trade equalizes prices, then the rewards to labor and capital (or skilled labor and unskilled labor) will be equalized in the trading countries. The intuition underlying this theorem is consistent with the popular notion that free trade would cause U.S. wages to fall to the much lower world average wage.

Conditions in the real world diverge sharply from the strict theoretical assumptions required for the Factor-Price Equalization Theorem to hold. The most important of these is that international differences in technology are in fact large, so that higher wages in general prevail in countries with superior production technology. It is now widely recognized that the ability of the H-O model to predict trade patterns is relatively weak, but improves markedly once international differences in technology and consumer preferences are recognized.[4] The tendency of consumers to prefer goods produced in their home countries, observed clearly in the data but excluded in the simple version of the H-O model, generates another force holding wages high in advanced-technology countries.[5] Even under free trade, such as the deep

[3] For a basic discussion of the Heckscher-Ohlin model, see Paul R. Krugman and Maurice Obstfeld, *International Economics: Theory and Policy*, 5th edition (Reading, MA: Addison-Wesley, 2000), pp. 66-91, 729-731; Richard E. Caves, Jeffrey A. Frankel and Ronald W. Jones, *World Trade and Payments: An Introduction*, 9th edition (Boston: Addison-Wesley, 2002), pp. 107-128, S-23 to S-27; and James R. Markusen, James R. Melvin, William H. Kaempfer and Keith E. Maskus, *International Trade: Theory and Evidence*, International Edition (Boston: McGraw-Hill, 1995), pp. 98-126, 445-451. For more detailed explanations, see Jagdish Bhagwati, Arvind Panagariya and T.N. Srinivasan, *Lectures on International Trade*, 2nd edition (Cambridge, MA: MIT Press, 1998), pp. 53-90, 107-130; and Kar-Yiu Wong, *International Trade in Goods and Factor Mobility*, (Cambridge, MA: MIT Press, 1995), pp. 23-138. Wong intermingles the treatment of the Ricardian, Heckscher-Ohlin, and specific factors models.

[4] Daniel Trefler, "The Case of the Missing Trade and Other Mysteries," *American Economic Review*, vol. 85, No. 5, (December 1995), pp. 1029-1046.

[5] Other features of the real world that undermine the theoretical conditions required for factor price equalization to hold under free trade are the presence of transport costs, wide variations in the proportions of productive resources in different countries, the presence of scale economies, the possibility that the ranking of goods according to intensity of resource use may differ across countries, and the fact that there really are more than two goods and two productive inputs. See Bhagwati, Panagariya, and Srinivasan, (1998), pp. 86-87.

market integration of the European Union (EU), product prices of identical goods converge slowly or not at all, thus making it less likely that wages will be equalized across countries by free trade.[6] Nonetheless, the tendency for trade liberalization to cause at least some price convergence across countries means that in principle, some associated wage convergence takes place as well, with the amount and speed of such convergence being a matter for empirical investigation.

Another result from the H-O model which has assumed importance in the debate on trade and wages is the Stolper-Samuelson theorem.[7] This theorem explains what happens when a country faces altered relative prices for its exports and imports. These alterations can occur when a tariff is imposed or removed or when other fluctuations in world markets alter the terms of trade. When the relative price of one good increases, the economic returns will increase for the factor that is more intensely used in the production of that good. The economic returns to the other factor will decline. For example, if the relative prices of goods using mostly unskilled labor decline relative to the prices of goods using mostly skilled labor, then the wages of unskilled labor should fall relative to the wages of skilled labor, and vice versa. The implication of the Stolper-Samuelson theorem is that if changes in international trade or trade policy affect relative wages, this effect should be transmitted through changes in relative prices of goods moving in a particular direction.

The H-O model assumes that workers in all industries earn the same wage at any point in time, and similarly that capital in all industries earns the same rate of return. A corollary of this is the prediction that if a trade liberalization leads to lower relative prices for unskilled-labor-intensive goods, all affected workers will tend to oppose that liberalization, while all owners of capital (or skilled workers) would tend to support it. In reality, proposals to raise the price of imports tend to be supported actively by both workers and firms in the industry involved. Workers in other industries with similar skill sets and educational levels generally have little comment, positive or negative, about the policy changes.

---

[6] Hassink and Schettkat find that the law of one price, which says that identical goods sold in different countries should sell for identical prices once transportation costs are taken into account, is violated for sales of IKEA furniture across the EU. Wolter H.J. Hassink and Ronald Schettkat, "On Price-Setting for Identical Products in Markets without Formal Trade Barriers," Utrecht University Discussion Paper No. 315, (June 2001). Goldberg and Verboven find that it takes between 5 and 8.3 years for European car markets to reduce by half the price differences for identical goods. Pinelopi Goldberg and Frank Verboven, "Market Integration and Convergence to the Law of One Price: Evidence from the European Car Market," CEPR Discussion Paper No. 2926 (August 2001).

[7] Wolfgang Stolper and Paul Samuelson, "Protection and Real Wages," *Review of Economic Studies*, vol. 9, (1941), pp. 58-73.

This outcome occurs because workers in different industries are in fact different, as is capital equipment used in different industries. These facts are reflected in the specific-factors model, which focuses on differing experiences of workers across industries as trade is liberalized.[8] The difference between this model and the H-O model is that some factors of production are assumed to be tied to a particular industry and cannot move at all. If trade liberalization leads to increased imports, and the price falls for domestic goods that compete with those imports, capital or labor resources in the import-competing industry that cannot move receive lower rates of return, while immobile resources in the expanded export industry receive higher rates of return. The specific factors model explains why the views of workers and firms about trade liberalization tend to be influenced relatively heavily by industry type, rather than by the particular skills or assets that those firms or workers possess.

The situation in actual labor markets represents an intermediate position between that represented by the H-O model, in which workers can move freely between industries without any change in wages, and the limited labor mobility of the specific factors model. The compensation of workers reflects in part specific job skills or "human capital" acquired in the industries and firms for whom they work. A significant portion of these skills are industry-specific, thus are not worth as much when the worker changes jobs or industries. Other skills are more universally useful. If market conditions generate new opportunities, workers may actually find that their skills are worth more in a different job or industry, and change jobs for that reason. Thus, workers will move from industry to industry depending on the market forces affecting those industries, but may experience significant costs, such as reduced wages. This means that labor markets create significant incentives for workers to remain in their current jobs. Workers generally move from one industry to another only when market conditions change. These changing conditions may be positive, as when better job opportunities arise, or negative, as when jobs are lost in a certain sector.

In summary, international trade theory predicts that for a country rich in physical and human capital such as the United States, which has traditionally placed import restrictions on goods made with less-skilled labor, trade liberalization may lower the returns to less-skilled labor. This prediction, though useful, is made under a simplified set of assumptions that abstract from the rich variety of phenomena occurring in actual labor markets.

Determinants of the Skilled Labor Premium

Since the 1970s, there has been a steady rise in the wages of more-skilled U.S. workers relative to the wages of less-skilled workers. This trend is

[8] For expositions of the specific-factors model, see op. cit., Krugman and Obstfeld, 2000, pp. 37-65 and pp. 723-728; Caves, Frankel and Jones, 2002, pp. 91-106, and pp. S-17 to S-22; Markusen, Melvin, Kaempfer and Maskus, 1995, pp. 127-141 and pp. 452-464; Bhagwati, Panagariya, and Srinivasan, 1998, pp. 91-106 ff.; and Wong, 1995.

apparent whether workers are compared by education, occupational category, or other proxies of skill. For example, wages of college graduates were approximately 38 percent higher than those of high school graduates in 1979, but were 63 percent higher in 1993.[9] In 1985, median weekly earnings of males working full time in managerial and professional specialty occupations were 79 percent higher than for operators, fabricators and laborers; by 2000 they earned 104 percent more.[10]

Competing explanations for the increase in the skilled-wage premium attribute the growing wage gap either to technological change or to increasing international trade, particularly trade with low-wage countries. Increased imports of goods produced with less-skilled labor might have pushed down the relative wage of such labor, particularly if such imports pushed down the relative price of such goods. Alternately, technical change may have increased the demand for intellectual labor relative to manual labor, for example, for computer skills relative to mechanical skills. This could account for the change in relative wages even in the absence of influences from international trade.

A number of econometric studies have attempted to identify the relative influences of trade and technology in increasing the relative wages of skilled workers over the past two decades. These methods have used a variety of methodological assumptions about the linkage between trade and wages. Regardless of the methodology used, there is a broad consensus among most studies that trade accounts for a relatively small amount of the wage changes and income distribution in developed countries. A recent International Monetary Fund literature review reported that "the consensus of empirical research suggests that increased trade accounts for only about 10 or 20 percent of the changes in wages and income distribution in the advanced economies."[11] Another literature review published by the Institute for International Economics states, "There is a concentration in the distribution of estimates [of the fraction of the increase in the skilled/unskilled wage ratio attributable to trade, immigration, and/or globalization] somewhere in the range of 10 to 15 percent of causation."[12] However, there are significant outliers on both sides of this estimate. A few studies conclude that virtually all of the rise in the skilled-unskilled wage premium is attributable to international trade, and a

[9] Gary Burtless, "Widening U.S. Income Inequality and the Growth in World Trade," Brookings Institution, unpublished manuscript, photocopy, September 1995, as cited in William R. Cline, *Trade and Income Distribution* (Washington, DC: Institute for International Economics, 1997) p. 19.

[10] USITC calculations using Bureau of Labor Statistics data.

[11] Matthew J. Slaughter and Philip Swagel, "The Effect of Globalization on Wages in the Advanced Economies," IMF Working Paper WP/97/43, April 1997, p. 3.

[12] William R. Cline, *Trade and Income Distribution* (1997), p. 139.

few conclude there is no influence of trade on wages.[13] Usually, most of the rest of the recent increase in earnings inequality is attributed to biased technological progress, i.e., an increase in the demand for skilled labor relative to less-skilled labor. The following observations will serve to indicate the general nature of some of the issues involved in this literature.

Arguing from the Stolper-Samuelson theorem, if imports of unskilled-labor-intensive goods depress U.S. wages of unskilled labor, the relative prices of such goods should be falling. Recent studies suggest that relative prices of unskilled-labor-intensive goods in the United States have not fallen.[14] In light of the Stolper-Samuelson theorem, this finding can then be interpreted as meaning that increased imports have had minimal effect on the wages of unskilled labor. The results of such studies can be sensitive to the sectors considered, particularly to the treatment of industries such as computers for which appropriate price measures are problematic.[15] Studies of this type usually conclude that most of the increase in the skilled-wage premium is due to technological change.

Several criticisms have been made of studies that use product prices to infer the effect of trade on wages. First, the real world deviates from the assumptions of the H-O model, and this can affect the validity of the Stolper-Samuelson theorem. Second, unskilled and skilled labor may not be well-measured by proxies such as production and nonproduction workers. Third, other features of the world changed at the same time as product prices. In particular, the supply of college graduates relative to less-educated workers has increased in recent decades.[16]

Other studies attempt to explain changes in relative wages by changes in imports rather than changes in product prices. In this approach, traded goods are considered to embody the labor they obtain in them, with imports representing an addition to the supply of U.S. labor (thus depressing wages) and exports representing a reduction in the supply of U.S. labor (thus increasing wages). The effect of imports is thus analogous to the effect of

---

[13] Space does not permit more than a general discussion of the relationship between the methodologies chosen and the results obtained in this body of literature. For additional information, see Cline, 1997; Swagel, 1997; Gary Burtless, "International Trade and the Rise in Earnings Inequality," *Journal of Economic Literature* vol. 33, No. 2, June 1995, pp. 800-878; Robert C. Feenstra, ed., *The Impact of International Trade on Wages* (Chicago: University of Chicago Press, 2000); and J. David Richardson, "Income Inequality and Trade: How to Think? What to Conclude?" *Journal of Economic Perspectives*, vol. 9, No. 3, Summer 1995, pp. 33-55.

[14] Robert Z. Lawrence and Matthew J. Slaughter, "Trade and U.S. Wages: Great Sucking Sound or Small Hiccup?" *Brookings Papers on Economic Activity,* vol. 2, 1993, pp. 161-226.

[15] Jeffrey D. Sachs and Howard J. Shatz, "Trade and Jobs in U.S. Manufactures," *Brookings Papers on Economic Activity*, vol. 1, 1994, pp. 1-84.

[16] William R. Cline, *Trade and Income Distribution*, 1997, pp. 90-92.

immigration. Some studies attempting to infer changes in relative wages from changes in import and/or immigration volumes have estimated relatively high wage effects,[17] while others estimated much smaller impacts.[18] Some of the highest and most controversial estimates assume that imports from developing countries in effect embody the much larger quantity of labor that is actually used to make the goods in developing countries.[19] Such methods attribute nearly all of the relative decline in U.S. wages of unskilled labor to international trade.

The broad thrust of this literature is that changes in technology and educational patterns probably drive most of the recent changes in the U.S. income distribution, with changes in international trade playing a secondary but non-trivial role.

Evidence on the Transition Experiences of Displaced Workers

New insights into the experiences of displaced workers and their relationship to international trade have been obtained from the analysis of large microeconomic datasets on individuals and households. The most comprehensive and publicly accessible of these data sets are the Displaced Workers Surveys, which are supplements to the Current Population Survey conducted by the Bureau of the Census for the Bureau of Labor Statistics (BLS).[20] The Displaced Workers Surveys are taken every 2 years and cover adults 20 years of age and older who have been involuntarily separated from their jobs other than for cause. The survey also contains information about the demographic characteristics of workers, the industries they leave, and whether or not they are re-employed at the end of the survey period.

---

[17] George J. Borjas, Richard B. Freeman, and Lawrence F. Katz, "How Much Do Immigration and Trade Affect Labor Market Outcomes?" *Brookings Papers on Economic Activity*, vol. 1, 1997, pp. 1-67.

[18] Lawrence F. Katz and Kevin M. Murphy, "Changes in Relative Wages 1963-1987: Supply and Demand Factors," *Quarterly Journal of Economics*, vol. 107, No. 428, February 1992, pp. 35-78; George J. Borjas and Valerie A. Ramey, "Foreign Competition, Market Power, and Wage Inequality: Theory and Evidence," National Bureau of Economic Research Working Paper No. 4556, December 1993.

[19] This approach is associated with Adrian Wood, e.g. in *North-South Trade, Employment and Inequality: Changing Fortunes in a Skill-Driven World* (New York: Oxford University Press, 1994).

[20] See U.S. Department of Commerce, Bureau of Labor Statistics, found at Internet site *http://www.bls.census.gov/cps/dispwkr/dispwkr.htm*, retrieved on June 10, 2002. A related series, the Mass Layoff Statistics, tracks employers, identified on the basis of unemployment claims, that have laid off 50 or more workers for a period of 31 or more days. Found at Internet address *http://www.bls.gov/mls/home.htm*, retrieved on June 10, 2002.

In a recent analysis of the Displaced Workers Surveys, Lori Kletzer identifies the differences between the displacement experiences of workers in a group of import-competing industries and workers in general.[21] Import-competing industries are defined as those with a large or increasing U.S. market share of imports during 1979-94. According to Kletzer, during 1979-1999, an estimated 6.4 million workers were displaced from such import-competing industries, and were concentrated in electrical machinery, apparel, motor vehicles, nonelectrical machinery, and blast furnaces. It should be noted that only about 25 percent of these workers are in industries facing significant import restraints as examined in this study and enumerated in Chapter 2. Kletzer's definition of import-competing industries includes textiles, apparel, footwear, leather products, watches and clocks, and pottery and related industries, each of which faces significant import restraints for some or all items. It also includes a significant number of workers in electrical and non-electrical machinery, computers, motor vehicles, and other industries for which import restraints are small or negligible.

In Kletzer's analysis, import-competing displaced workers share many characteristics with other displaced workers. Compared with other displaced manufacturing workers, these workers are approximately equal in educational attainment and job tenure, slightly older, and significantly more likely to be female.[22] Import-competing displaced workers are slightly less likely to be re-employed than other displaced manufacturing workers as of their survey date, in part due to the lower re-employment rates of displaced females.[23] Earnings experiences of import-competing displaced workers vary widely, with about 36 percent of such workers reporting earning the same or more on their new jobs and 25 percent of such workers reporting earnings losses of 30 percent or more.[24] These experiences are similar to those for other displaced manufacturing workers. Kletzer's estimates imply a loss in wages of 12.4 percent for manufacturing workers in industries with high import competition to a loss in wages of 8.2 percent for manufacturing workers in industries with low import competition.[25] High earnings losses on re-employment are more prevalent among older, less-educated, lower-skilled production workers with longer job tenure, particularly if these workers change industries when

[21] Lori G. Kletzer, *Job Loss from Imports: Measuring the Costs* (Washington, DC: Institute for International Economics, 2001).

[22] While 37 percent of all displaced manufacturing workers are female, the female share of displaced workers reaches 80 percent in apparel, 76 percent in knitting mills and 66 percent in footwear. This is largely explained by the high female share of employment in those industries.

[23] Survey-date re-employment rates are 63.4 percent for import-competing displaced manufacturing workers, 65.8 percent for all displaced manufacturing workers, and 56.2 percent for females.

[24] Lori G. Kletzer, *Job Loss from Imports: Measuring the Costs*, (2001) Table 3.3, pp. 36.

[25] Kletzer (2001) and USITC calculations.

they find new jobs. Contrary to popular belief, approximately 50 percent of import-competing workers are re-employed in manufacturing. Only about 10 percent go to retail trade, and the rest go to other sectors of the economy.

As shown in previous chapters, the largest category of workers facing potential job displacement as a result of unilateral U.S. import liberalization are in the textile and apparel sectors. Alfred Field and Edward Graham analyze the displacement experiences of these workers in North Carolina, which accounts for one-third of U.S. textile employment and 8 percent to 10 percent of U.S. apparel employment.[26] Their data were obtained from the Employment Security Commission of North Carolina as part of the Project on Mass Lay-offs and Plant Closings of the USDOL. The data used in the Field and Graham study covered the experiences of approximately 35,000 workers, including 7,500 textile and apparel workers, who lost their jobs as a result of mass lay-offs or plant closings between the third quarter of 1986 and the fourth quarter of 1991 and, if re-employed, found new jobs by the first quarter of 1992. These workers were identified as a result of filing for unemployment compensation in North Carolina.

The average duration of unemployment for apparel workers was 2.3 quarters; for textile workers, 2.1 quarters; for workers in other manufacturing, 1.9 quarters; and for non-manufacturing workers, 2.5 quarters. Apparel workers who were re-employed experienced an estimated average 5 percent wage increase if re-employed by the same industry and 34 percent wage increase if employed by other industries. This increase in wages contrasts with the findings of Kletzer, who reports earnings losses for workers in apparel and knitting mills on re-employment.[27] The differences in results have a variety of potential explanations, including geographic and time coverage of the sample, the effects of sample truncation at the end of the period, and the way wage data were collected. The Field and Graham study relies on industry average wages as proxies for re-employment wages, while the Displaced Workers Survey relies on workers' self-reporting of wages in the old and new jobs. For textile and apparel workers in particular, the number of actual observations available to Field and Graham was much larger than that available through the Displaced Workers Survey.

---

[26] Alfred J. Field and Edward M. Graham, "Is there a Special Case for Import Protection for the Textile and Apparel Sectors Based on Labour Adjustment?" *The World Economy*, vol. 20, No. 2 (Mar. 1997), pp. 137-157.

[27] Kletzer (2001) pp. 38-39. The estimated median (mean) declines in weekly earnings after reemployment were approximately 4 percent (8 percent) in apparel and approximately 2 percent (11 percent) in knitting mills, for a sample covering 1979 through 1999.

Some studies of worker displacement associated with trade make use of data generated in the Trade Adjustment Assistance and NAFTA Trade Adjustment Assistance (TAA and NAFTA-TAA) programs.[28] During fiscal years 1995 through 1999, the estimated number of workers covered by certifications under TAA and NAFTA-TAA averaged about 167,000 annually, about 40 percent of which had been employed in textiles and apparel.[29] The eligibility criteria for these programs have changed over time and relate primarily to increases in imports. In the case of NAFTA-TAA, eligibility criteria also changed for the relocation of production facilities from the United States to Canadian or Mexican locations. Program eligibility requirements dictate that only a subset of those workers experiencing displacement due to increases in imports is likely to be identified in program data, and; these workers may have different characteristics from all import-displaced workers.

None of these above studies of import-competing displaced workers is designed to identify workers who were displaced specifically as a result of a specific trade policy action. The section that follows addresses the issues involved in linking specific trade policy changes to effects on job displacement.

Estimated Effects of Simultaneous Liberalization of Import Restraints on Displaced Workers

The modeling results from Chapter 2 showed that simultaneous liberalization of all significant U.S. import restraints in 1999 would result in the displacement of 174,784 net FTE workers who would eventually relocate to other sectors. Nearly 90 percent of these workers would be displaced from textile and apparel jobs. This chapter uses data from a variety of sources to estimate the consequences to workers of displacement resulting from import restraint liberalization,[30] as well as the consequences for U.S. labor markets in general. In particular:

[28] Recent analyses of these programs are contained in a series of GAO reports to the Chairman and Ranking Minority Member, Committee on Finance, U.S. Senate: "Trade Adjustment Assistance: Trends, Outcomes, and Management Issues in Dislocated Worker Programs," GAO-01-59 (October 2000); "Trade Adjustment Assistance: Impact of Federal Assistance to Firms is Unclear," GAO-01-12 (December 2000); and "Trade Adjustment Assistance: Experiences of Six Trade-Impacted Communities," GAO-01-838 (August 2001).

[29] GAO, "Trade Adjustment Assistance: Trends, Outcomes, and Management Issues in Dislocated Worker Programs" (October 2000), p. 9.

[30] Technical details underlying the data and calculations in this section may be found in appendix G.

- Estimates of the geographic distribution of IR displaced workers are generated by matching the estimated number of IR displaced workers by industry with geographic data from the State and Area Employment, Hours and Earnings series of the Current Employment Survey, published by the U.S. Department of Labor, Bureau of Labor Statistics (BLS), and from the 1997 Economic Census of the USDOC, Bureau of Census.

- Estimates of the post-displacement experiences of IR displaced workers, including length of time before re-employment, probability of re-employment, and difference between wages in old and new jobs, are generated by using the estimated number of IR displaced workers by industry in conjunction with data from the Displaced Workers Surveys for 1998 and 2000, which cover workers displaced during 1995-99. The post-displacement experiences of these workers are estimated using survey data on workers actually displaced from the same industries during 1995-99, and are compared with the experiences of all displaced workers in the U.S. economy during the same time period.

- Estimates of other demographic and job-related characteristics of IR displaced workers are generated in the same manner as the estimates of the post-displacement experiences. Demographic characteristics of workers include such variables as age, sex, race, educational status, marital status, and whether or not the worker is identified as Hispanic. Job-related characteristics include length of tenure on the lost job, reason for displacement, whether the worker moved after displacement, whether the worker received unemployment compensation after displacement, or belonged to a union or similar employee organization before displacement.

Estimated Geographic Distribution of IR Displaced Workers

Most industries, including those of concern in the present study, are not scattered evenly across the United States, but show some degree of geographic localization. This localization is particularly strong for some branches of the textile and apparel trades, including weaving and finishing mills; floor covering mills; yarn and thread mills; and hats, caps, and millinery.[31] Thus, it is reasonable to expect that in the event of the simultaneous unilateral liberalization of all significant U.S. import restraints, the workers displaced would be concentrated disproportionately in certain areas.

[31] Paul Krugman, *Geography and Trade* (Leuven and Cambridge, MA: Leuven University Press and The MIT Press, 1991), appendix D.

One simple way to estimate the geographic distribution of IR displaced workers is to apportion the estimated number of displaced workers for each industry among the U.S. states according to 1997 state-by-state employment in those industries, as reported in the most recent Economic Census. While this is a good first approximation, it is likely that increased import competition would cause more job displacement among those firms with relatively less efficient or competitive operations. Data from the State and Area Employment, Hours and Earnings series on actual historical job losses can be used to shed light on the relative strength of textile and apparel employment in various states. According to these data, between 1997 and 2001, nationwide employment in textile mill products declined by 19.0 percent, from 618,100 workers to 500,700 workers, and employment in apparel and other textile products declined by 29.6 percent, from 823,600 workers to 586,600 workers.[32] The actual rates of job loss by state were not proportionate to the initial number of jobs, and were generally higher in states where employment was heavily concentrated.

Accordingly, two alternate estimates of the geographic concentration of IR displaced workers are presented. Method I assigns workers in textiles and apparel to states in proportion to actual job losses between 1997 and 2001. The assumption made is that if the liberalization had taken place in 1999, the location of workers and firms most affected would be similar to those who experienced actual job losses during that period.[33] Workers in other sectors were assigned to states in proportion to 1997 baseline employment. Method II assigns workers in all sectors to states in proportion to 1997 baseline employment.

Because the data sources used for this calculation do not assign every worker in the United States in every industry to a state or other location, the estimated assignment of displaced workers to states is incomplete.[34] In Method I, the locations of all estimated displaced textile and apparel workers in

[32] For the industries containing smaller numbers of IR displaced workers (food processing, maritime transportation, tariff-peak industries) nationwide employment variously rose or fell between 1997 and 2001, or cannot be measured with the available data.

[33] For all calculations with respect to the geographic distribution of displaced workers, "textiles and apparel" refers to the industries in SIC 22 and 23, and thus excludes man-made fibers, leather products and leather gloves. These industries are classified as ATC sectors in Chapter 2. Estimated state-by-state job losses for each of the subsectors of textiles and apparel are assumed to be proportional to the percentage job loss in the appropriate aggregate category "textiles" or "apparel" for the nation as a whole.

[34] For each industry for which table 2-3 estimates job losses, workers have been assigned to states according to data in the 1997 Economic Census, Bureau of the Census, USDOC. State-by-state employment data for 1999 are from the BLS, Current Employment Statistics, "State and Area Employment, Hours and Earnings" series, and state-by-state job losses in textiles and apparel are from the same series. National total employment for water transportation is from "Current Employment Statistics," table B1NSA, Employment Situation.

table 2-3 are assigned to states or other jurisdictions, while in Method II approximately 85.4 percent of all displaced textile and apparel workers have been so assigned. For both methods, the coverage ratio is 50.4 percent in sectors other than textiles and apparel. The data do not include geographic distributions for workers in cotton, miscellaneous food preparations, or tobacco stemming and redrying. In aggregate, Method I assigns locations to about 85.9 percent of all displaced workers with estimated job losses, as detailed in table 2-3. Method II assigns locations to approximately 74.3 percent of such workers. Thus, the total of geographically allocated displaced workers listed in table 7-1 is less than the total of estimated job losses for all sectors with declining employment, which is detailed in table 2-3. However, the estimate of total job losses is higher for Method I than for Method II.

Both methods provide a similar percentage of displaced workers by state, but Method I yields a greater geographic concentration of IR displaced workers. Figure 7-1 provides a visual depiction of the results according to Method I. Under Method I, the jurisdictions with the highest estimated ratios of IR displaced workers to all workers are primarily in the Southeast. In descending order, these are North Carolina, South Carolina, Mississippi, Rhode Island, Georgia, Tennessee, Puerto Rico, Virginia, New York, and Kentucky. These 10 jurisdictions would account for approximately 69 percent of all displaced workers that can be geographically assigned according to Method I, and 57 percent according to Method II. Eight of these 10 locations also appear in the top 10 using Method II, which places Alabama in seventh place and California in ninth place. While Alabama and California have a significant amount of apparel and textile employment, actual historical job losses have been relatively mild. The data on actual historical job losses during 1997-2001 concentrates the estimates of IR job losses more heavily in North Carolina, Mississippi, Tennessee, and South Carolina.

When estimated IR job displacement in textiles and apparel are assumed to be proportionate to historical 1997-2001 job losses, the estimated IR job displacement is less than 0.5 percent of total employment in all states except for the Carolinas, where it is 1.14 percent of total employment in North Carolina and 0.73 percent in South Carolina. These estimates drop to 0.72 percent for North Carolina and 0.62 percent for South Carolina when such displacement is assumed to be proportional to baseline employment in each industry.

Estimated Post-Displacement Experiences of IR Displaced Workers[35]

The Displaced Workers Survey provides information that can be used to assess the relative severity of the displacement experience for different types of workers. It assists in analyzing whether the experiences of workers displaced

[35] For details on the construction of the hypothesis tests used in this section, see appendix F.

Table 7-1
Estimated IR displaced workers by state

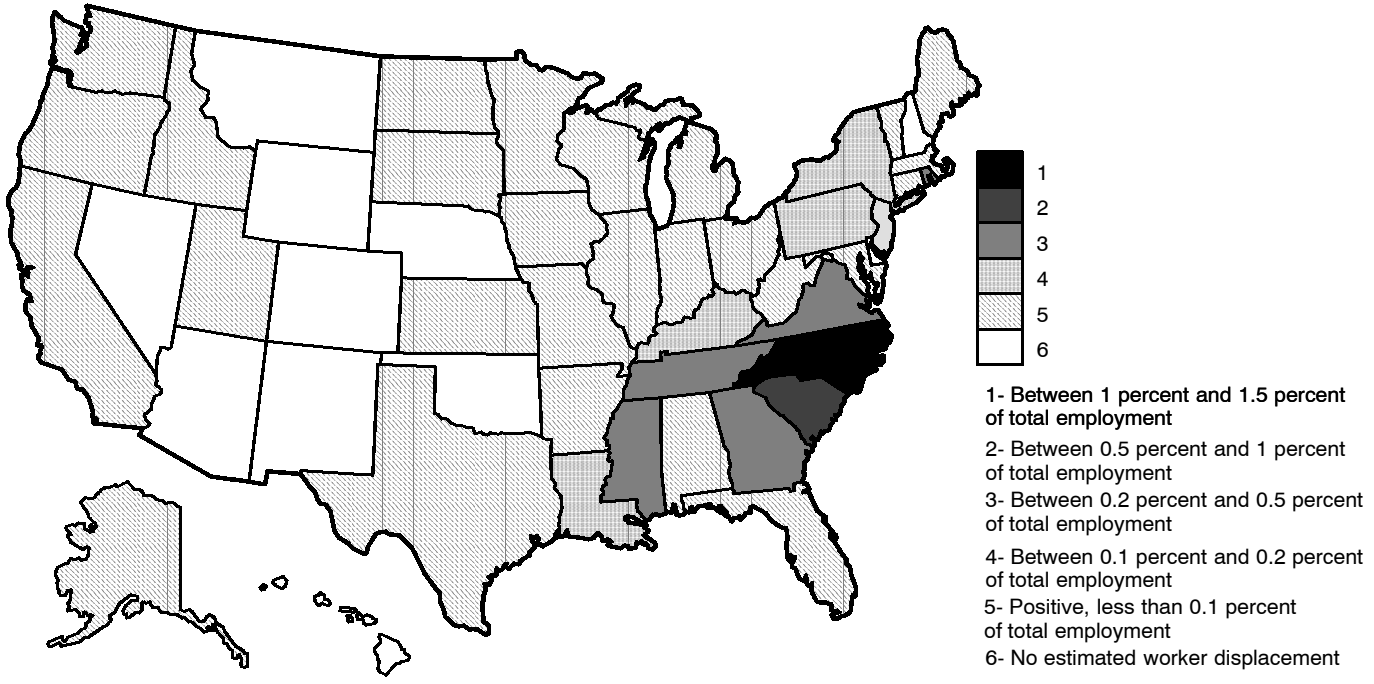
State	State-level total employment in 1999	Estimated IR displaced workers: Method I - Textile and apparel based on 1997-2001 job losses	Estimated IR displaced workers: Method II - All industries proportional to 1997 baseline employment	Method I	Method II
	1,000 workers	*Number of workers*		*Percent of total state employment*	
North Carolina	3,870.4	43,946	27,775	1.14	0.72
South Carolina	1,830.6	13,339	11,440	0.73	0.62
Mississippi	1,153.2	3,791	2,170	0.33	0.19
Rhode Island	450.0	1,276	995	0.27	0.21
Georgia	3,883.1	10,059	10,421	0.26	0.27
Tennessee	2,685.4	6,594	3,625	0.26	0.27
Puerto Rico	1,009.0	2,330	1,752	0.23	0.17
Virginia	3,231.8	7,005	4,438	0.21	0.13
New York	8,067.1	16,836	11,885	0.20	0.14
Kentucky	1,795.5	2,642	2,027	0.15	0.11
New Jersey	3,901.1	5,604	4,084	0.14	0.10
Pennsylvania	5,586.1	7,104	5,801	0.13	0.10
Louisiana	1,896.2	2,401	2,240	0.13	0.12
Alabama	1,919.5	1,812	2,714	0.09	0.14
Maine	586.3	544	652	0.09	0.11
Florida	6,827.0	5,826	4,188	0.09	0.06
Texas	9,159.2	7,339	6,394	0.08	0.07
California	13,992.0	11,171	19,185	0.08	0.14
Arkansas	1,104.0	715	548	0.06	0.05
Virgin Islands	41.1	17	17	0.04	0.04
Massachusetts	3,236.8	1,247	2,185	0.04	0.07
Iowa	1,468.6	449	495	0.03	0.03
Washington	2,648.7	709	863	0.03	0.03
Vermont	291.3	74	62	0.03	0.02
Connecticut	1,669.1	390	388	0.02	0.02
Alaska	277.8	64	64	0.02	0.02
West Virginia	726.0	157	119	0.02	0.02
Ohio	5,563.5	1,199	1,797	0.02	0.03
Wisconsin	2,783.9	446	804	0.02	0.03
Oregon	1,575.0	183	352	0.01	0.02
Illinois	5,958.3	684	1,591	0.01	0.03
Utah	1,048.6	42	66	0	0.01
Kansas	1,327.0	38	327	0	0.02
Indiana	2,969.9	65	900	0	0.03
Missouri	2,726.6	35	164	0	0.01

Table 7-1—*Continued*
Estimated IR displaced workers by state

State	State-level total employment in 1999	Estimated IR displaced workers			
		Method I - Textile and apparel based on 1997-2001 job losses	Method II - All industries proportional to 1997 baseline employment	Method I	Method II
	1,000 workers	*Number of workers*		*Percent of total state employment*	
Minnesota	2,613.0	32	100	0	0
Idaho	538.9	6	13	0	0
Maryland	2,386.5	22	31	0	0
South Dakota	373.2	3	13	0	0
Michigan	4,582.0	28	2,092	0	0.05
North Dakota	323.9	1	1	0	0
New Mexico	729.6	0	0	0	0
Hawaii	616.0	0	0	0	0
New Hampshire	605.8	0	204	0	0.03
Delaware	412.9	0	0	0	0
Nebraska	892.7	0	6	0	0.01
Oklahoma	1,461.9	0	0	0	0
Colorado	2,131.8	0	50	0	0
Montana	380.4	0	17	0	0
Arizona	2,163.1	0	41	0	0
District of Columbia	627.4	0	0	0	0
Nevada	982.9	0	0	0	0
Wyoming	233.0	0	0	0	0
Totals	129,855.3	156,225	135,096	0.12	0.10

Source: USITC calculations.

Figure 7-1
Estimated distribution of import-restraints displaced workers



Source: Commission calculations.

by import restraint liberalization is more or less severe than the experiences of those workers displaced throughout the U.S. economy as a whole. This information includes the length (in weeks) of unemployment for workers who were rehired after displacement, the probability of re-employment by the time of the sample date, the difference in wages between a worker's previous and current job, whether the worker received written notice prior to termination, the reason for displacement, whether the worker received unemployment compensation, and whether the worker moved after displacement.

The following analysis compares workers in those industries most likely to experience a contraction of employment after simultaneous liberalization of all U.S. import restraints to all displaced U.S. workers. It uses workers actually displaced from their jobs in those industries during 1995-99 as proxies for IR displaced workers.[36] These differences are summarized in table 7-2.

In interpreting the results of this analysis, it should be noted that although the surveys provide over 11,000 observations of workers who have been displaced during the sample period, only about 440 of these observations pertain to IR displaced workers. Not every worker provided information for every question on the survey, and for particular sub-industries, the count of IR displaced workers is five or fewer in some cases.[37] The comparisons of IR displaced workers to all displaced workers are thus sensitive to the estimated shares of displacement by industry as presented in Chapter 2, as well as to the weighting scheme used for individual obsservations.[38]

[36] Since the Displaced Workers Survey is a stratified sample (workers are sampled with unequal probabilities in order to obtain more information on subcategories of workers of particular interest), the observations in both the sample of all workers and the subsample of IR displaced workers are weighted by the sample weights for each observation provided by the Bureau of Labor Statistics. The subsample of IR displaced workers is then reweighted by the reduction in the number of jobs estimated for each industry in Chapter 2 as a result of simultaneous unilateral liberalization of all significant U.S. import restraints.

[37] For example, sugar; carpets and rugs; and plastics, synthetics, and resins, the latter of which corresponds to manmade fibers.

[38] As described in appendix F, an alternate weighting scheme was employed that does not utilize the information provided by the Bureau of Labor Statistics on stratified sampling but simply gives each observation in each IR industry the same weight. While most results are robust to changing the weighting scheme, some change significantly. For example, using the alternate weighting scheme, the estimated mean completed spell of unemployment for IR displaced workers increases from 14.02 weeks to 15.56 weeks, the estimated share of black IR displaced workers declines from 19.4 percent to 15.3 percent, and the estimated female share increases from 60.2 percent to 61.8 percent. These results also give an approximate indication of the robustness of the comparisons to changes in the estimated share of worker displacement by industry. The preferred results, reported in the main text, take advantage of the weights on observations in the Displaced Workers Survey reported by the USDOL, BLS as part of their stratified sampling design.

Table 7-2
Difference between post-displacement experiences of IR workers and all workers, 1995-99

	IR displaced workers	All displaced workers
	Percent	
Mean completed spell of unemployment *(weeks)*	[1]14.02	10.48
Percent finding new job by survey date	[2]64.05	80.41
Ratio of mean wage at current job to mean wage at lost job	[2]4.48	8.82
Percent earning wages at current job which are less than 80 of lost job	10.45	12.96
Percent receiving written notice that they would lose their job, plant would close, etc.	[1]35.44	35.34
Reason for displacement:		
Plant or company closed down or moved	[1]58.22	24.79
Insufficient work	[1]29.69	21.44
Position or shift abolished	[3]12.10	14.18
Seasonal job completed	[1]0	4.07
Self-operated business failed	[1]0	1.47
Some other reason	[1]0	33.05
Percent moving to different city or county after displacement	[1]10.54	14.42
Percent receiving unemployment insurance benefits after old job ended	[1]63.76	38.33

[1] Difference between samples is statistically significant with 99 percent confidence.
[2] Difference between samples is statistically significant with 95 percent confidence.
[3] Difference between samples is statiscally significant with 90 percent confidence.

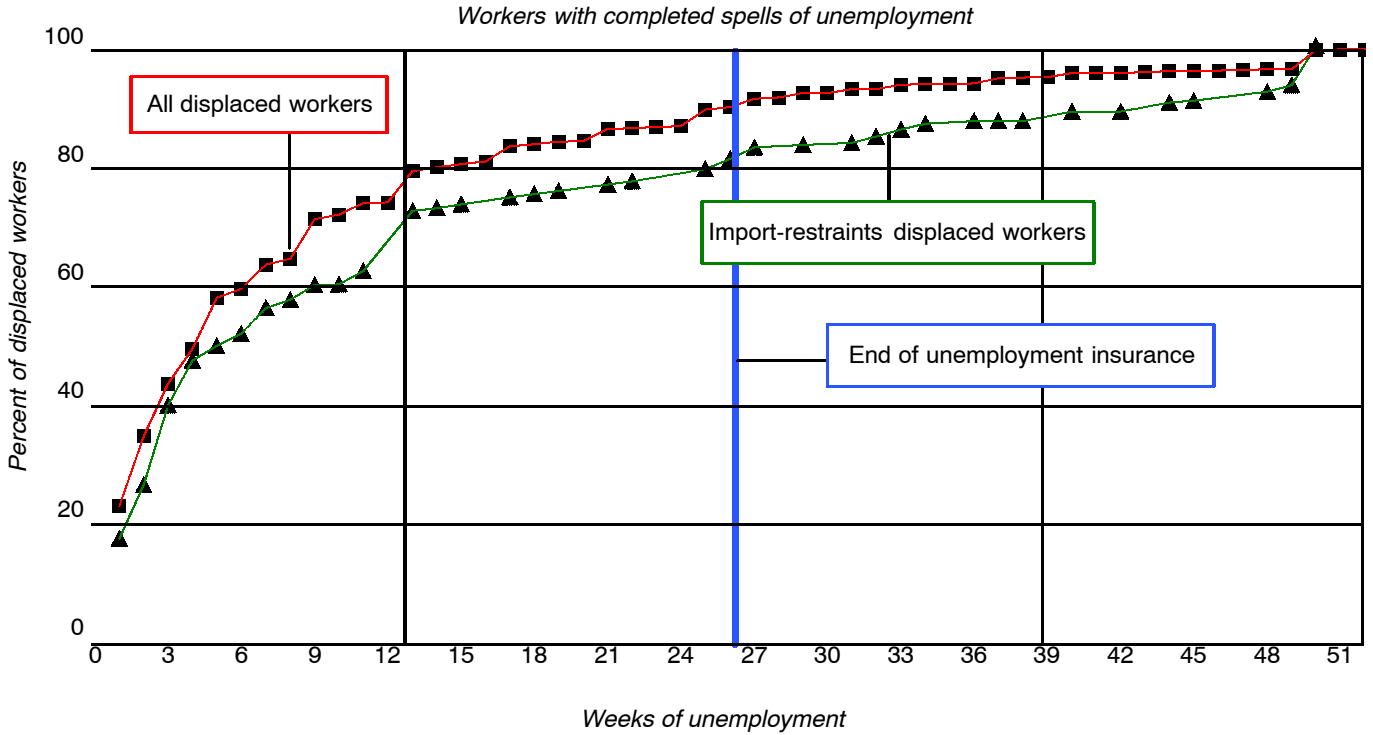
Source: Displaced Workers Survey, BLS, USDOL, found at *www.bls.census.gov/cps/dispwkr/dispwkr.htm*, retrieved Dec. 31, 2001 and USITC calculations.

The estimated periods of unemployment are somewhat longer than average for IR displaced workers, averaging 14.02 weeks, compared with 10.48 weeks for all displaced workers. Figure 7-2 illustrates the distribution of periods of unemployment for all displaced and IR displaced workers.

Approximately 10.5 percent of all displaced workers and an estimated 19.7 percent of IR displaced workers have periods of unemployment exceeding the 26 weeks at which unemployment insurance is usually exhausted. The estimated share of IR workers who found jobs at the time of the survey is 64.1 percent, compared with 80.4 percent for all displaced workers.

These statistics appear to suggest that IR displaced workers have a harder time finding re-employment than other workers. In interpreting these comparisons, several cautions are in order. The data on periods of unemployment are probably more useful than those on the percentage of workers who have been rehired. The probability of rehire measure the number of workers as of the survey date (February 1998 or February 2000) as a share of all those workers displaced during the period when workers were surveyed

Figure 7-2
Cumulative weeks of unemployment



Source: Displaced Workers Survey, BLS, USDOL, found at *www.bls.census.gov/cps/dispwkr/dispwkr .htm*, retrieved Dec. 31, 2001, and USITC calculations.

(1995-97 or 1997-99). Thus, workers laid off just before the survey date will not have been rehired but may experience only short periods of unemployment. This possibility cannot be checked directly because the survey does not reveal the date of displacement with precision, and because about one-third of displaced workers report being displaced and rehired more than once.[39]

Moreover, a displaced worker who has not found a job by the survey date may not be unemployed at all. This worker may have left the labor force for a variety of reasons. Such persons include retirees, homemakers, students, and discouraged workers who leave the labor force.

Table 7-3 shows the labor force status of displaced workers at the time the survey is taken. The percentage of IR workers not in the labor force is significantly higher than for all displaced workers. At least part of the difference between labor force attachment rates, and thus employment probabilities at the time of the survey date, relates to differing characteristics of workers in different industries. As will be seen below, a higher number of IR displaced workers are female. The percentage of female workers in the apparel industry is particularly high. As the table shows, when workers with more similar characterisics are compared (e.g. comparing only female workers, or only married female workers with the spouse present) the difference in labor force exit rates between IR displaced workers and all displaced workers decreases.

Table 7-3
Labor force status of IR displaced workers and all displaced workers, 1995-99

	IR displaced workers	All displaced workers
	Percent	
Percent employed at time of survey	[1]59.2	72.3
Percent unemployed at time of survey	[1]9.9	10.4
Percent not in labor force at time of survey	[1]26.7	14.8
If female	[1]30.1	20.8
If female, married, spouse present	26.9	25.5

[1] Difference between samples is statistically significant with 99 percent confidence.
[2] Difference between samples is statistically significant with 90 percent confidence.

Source: Displaced Workers Survey, BLS, USDOL, found at *www.bls.census.gov/cps/dispwkr/dispwkr.htm*, downloaded Dec. 31, 2001 and USITC calculations.

[39] The length of unemployment period refers to the first period of unemployment, for which the data are most extensive.

On average, both IR displaced workers and all displaced workers are earning more in their current jobs than in the job they left: 8.8 percent more for all displaced workers and 4.5 percent more for IR displaced workers.[40] Again, because some workers have multiple periods of unemployment, this calculation may not be a direct comparison of the difference between the old job and the first new job. The proportion of workers experiencing severe wage decreases (exceeding 20 percent) is estimated to be lower for IR displaced workers (10.4 percent) than for all displaced workers (13.0 percent), but this difference is not statistically significant.

The likelihood that a worker receives written notice before displacement is significantly higher for IR displaced workers than for all displaced workers. IR displaced workers are much more likely to have lost their jobs for reasons associated with permanently reduced demand for their U.S. industries' output, such as the plant or company closing or moving, insufficient work, or their position or shift being abolished. These reasons account for an estimated 100 percent of displacements among IR workers, compared with 70.4 percent of all displacements. IR workers also are significantly more likely to receive unemployment insurance than other workers after their old job ends (63.8 percent for IR workers versus 38.3 percent for all workers), perhaps in part because their reasons for displacement are more likely to coincide with the eligibility criteria for unemployment insurance.[41] IR displaced workers are estimated to be significantly less likely to move geographically after losing their jobs than displaced workers as a whole (10.5 percent of IR workers versus 14.4 percent of all workers).

Estimated Demographic and Job-Related Characteristics of IR Displaced Workers

As Kletzer notes, the reasons for post-displacement outcomes may have less to do with the industry from which the worker was displaced than with characteristics of the workers themselves. She found that both the probability of re-employment and the current wage were higher for displaced workers younger than age 45 and for more-educated displaced workers. Post-

[40] Neither figure is adjusted for inflation.

[41] The eligibility requirements for unemployment insurance are determined by State law. They include the requirement that the worker have been employed steadily during a base period (in most States, four out of the last five completed calendar quarters prior to the filing of a claim), that the worker be unemployed through no fault of their own (as determined by State law) and other requirements. See the USDOL website at *http://workforcesecurity.doleta.gov/unemploy/uifactsheet.asp*, retrieved on June 7, 2002. Workers on seasonal jobs, self-employed workers, and those displaced for miscellaneous reasons may have a harder time qualifying under such requirements than workers whose plant or firm closes, offers them insufficient work, or abolishes their position or shift.

displacement outcomes also are better for workers with short rather than long tenure on their previous jobs; this effect is clearer and stronger for post-employment wages than for the probability of re-employment. Females and minority workers[42] were less likely to be re-employed by the survey date, particularly married females displaced from manufacturing. Married females earned lower wages at the time of the survey relative to their previous jobs than other displaced workers.[43] Thus, some of the differences in outcomes for IR displaced workers may be associated with their personal characteristics.

Table 7-4 illustrates the estimated differences between personal and employment characteristics of IR displaced workers and all displaced workers from 1995 to 1999. IR displaced workers are estimated to be significantly more likely to be female, significantly more likely to belong to minority groups (particularly Hispanic, black, and Asian/Pacific Islander), significantly less educated than other displaced workers, and more likely to be older (an average of 42.1 years for IR workers versus 38.3 years for all workers). They are equally likely to have belonged to a union or similar employee organization on their previous jobs. A similar majority of all displaced workers (54.3 percent) and estimated IR displaced workers (54.7 percent) are married, with spouse present. The estimated percentage of IR displaced workers who never-married is lower, which is associated with the higher average age of such workers, while the estimated percentages of divorced or separated workers is higher than for all displaced workers. IR displaced workers are estimated to have longer tenure on their previous jobs at 7.1 years than all displaced workers at 4.9 years, which may also be associated with age.

Both Kletzer's analysis and table 7-3 associate particular worker characteristics with lower probabilities of re-employment and lower post-re-employment wages for the population as a whole. On balance, IR displaced workers are more likely than other displaced workers to possess these characteristics, which may explain much of the difference in estimated post-displacement experiences of IR displaced and all displaced workers. This makes it less likely that simply being in an import-sensitive industry causes the displacement experience to be more severe.[44]

---

[42] Kletzer (2001) defines minority workers as both nonwhite workers and Hispanic workers. In the Current Population Survey, the identification as "Hispanic" is a nonracial category that may coincide with any race (see footnote 48).

[43] For comparison, note that Kletzer (2001) used all Displaced Workers Surveys from 1984-2000, covering workers displaced from 1979-99. while the present study used only the surveys from 1998 and 2000, covering workers displaced from 1995-99, in order to better match the year of the model experiment. Kletzer found that the probability of reemployment in general was significantly higher for workers displaced during 1993-99 than during 1979-92.

[44] No regression analysis has been performed to see whether any part of the difference in outcomes is attributable to being an IR displaced worker per se.

Table 7-4
Difference between personal and job characteristics of IR displaced workers and all displaced workers, 1995-99

	IR displaced workers	All displaced workers
Age *(years)*	[1]42.1	38.8
Sex *(percent female)*	[1]60.2	46.8
Hispanic *(percent)*	[1]27.8	13.0
Length of tenure on old job *(years)*	[1]7.1	4.9
Member of union or other similar employee organization on old job *(percent)*	[3]11.8	9.4
	Percent	
Education:		
Less than high-school diploma	[1]33.8	14.0
High-school diploma	[1]34.8	32.8
Some college	[1]23.9	31.1
Bachelor's degree	[1]6.3	15.7
Some graduate education	[1]1.8	6.3
Marital status:		
Married-spouse present	54.7	54.3
Married-spouse absent	1.7	1.6
Widowed	2.5	2.1
Divorced	[2]16.8	13.1
Separated	[1]6.8	3.5
Never married	[1]17.6	25.3
Race:		
White	[1]74.0	82.3
Black	[1]19.4	13.2
American Indian, Aleut, Eskimo	[2]3.1	1.2
Asian or Pacific Islander	3.5	3.3

[1] Difference between samples is statistically significant with 99 percent confidence.
[2] Difference between samples is statistically significant with 95 percent confidence.
[3] Difference between samples is statistically significant with 90 percent confidence.

Source: Displaced Workers Survey, BLS, USDOL, found at *www.bls.census.gov/cps/dispwkr/dispwkr.htm*, downloaded Dec. 31, 2001 and USITC calculations.

Other Possible Consequences of Potential Worker Displacement Due to Trade Liberalization

Aggregate Unemployment

The estimated 175,000 workers who would be displaced if all significant U.S. import restraints were unilaterally liberalized is relatively small compared to the size of the economy. It is important to recognize that trade policies under agreements the United States has implemented, such as NAFTA and the Uruguay Round Agreements, are often phased in over periods of 5 to 15 years.

The following calculations with respect to the unemployment rate model the amount of displacement as occurring simultaneously. Although these represent an unrealistic scenario, given the phase-in period normally followed, they can be viewed as an extreme upper bound for evaluating the displacement effects of the liberalization analyzed in this report.

In a typical week, between 300,000 and 400,000 U.S. workers apply for unemployment compensation. Given that an estimated 63.8 percent of IR displaced workers likely would receive unemployment compensation (see table 7-2), the estimated one-time increase in workers receiving unemployment compensation as a result of removing all significant import restraints is approximately 111,000,[45] equal to about two days' worth of new claims. This estimate takes into account the fact that workers in the affected industries are significantly more likely to receive unemployment insurance, as reflected in the data from the Displaced Workers Survey.

Also, as shown above in the data on periods of unemployment, many workers find jobs within several weeks or months of displacement.[46] If all 175,000 workers had been laid off simultaneously during 1999, aggregate unemployment would have increased from the average 4.22 percent observed in calendar 1999 to 4.34 percent, with the measured difference being negligible (less than 0.05 percent) within several months after the initial displacement, as many of the displaced workers found work or left the labor force. Local or regional effects, as discussed below, might differ.

As previously stated, such effects mark an extreme upper bound. Not only would an actual liberalization be phased in over a period of time, but both workers and firms likely would anticipate the policy action, also causing the labor market effects to appear gradually. For example, by 1995 it was known that U.S. quantitative restrictions in textiles and apparel were scheduled for elimination in 2005. Worker and firm decisions based on this knowledge may have contributed to the steady declines in employment in those industries in the intervening years.

[45] This number is derived as follows: (174,784 displaced FTE jobs)* (0.6376) = approximately 111,442. USITC calculation.

[46] The average duration of unemployment is most likely higher during recessions and lower during expansions. While no direct comparisons of unemployment duration across time were readily available, it is known that displacement rates of long-tenured workers are higher during recession years (Ryan T. Helwig, "Worker Displacement in a Strong Labor Market," *Monthly Labor Review*, June 2001, pp. 13-28; see Table 1) and that the probability of re-employment for workers with similar personal characteristics is higher during periods of prolonged expansion than during recession (Kletzer, 2001, Tables 4.1 and 4.2).

Regional Employment Effects

The estimated differences between the displacement experiences of workers in industries significantly affected by import restraints and other displaced workers may appear relatively mild, considering that the workers in question likely would be concentrated in just those states that have experienced significant contractions in textile and apparel employment in recent years. According to the analysis earlier in this chapter, actual displaced workers in these and other industries affected by import restraints experienced a period of unemployment not much greater than those of other displaced workers and were less likely than other workers to experience severe wage losses exceeding 20 percent. Part of the explanation may lie in the fact that the recent contraction in textile and apparel employment has taken place in parts of the country for which aggregate employment has increased strongly. Thus, displaced workers in textiles and apparel have found alternate opportunities in other industries.

Table 7-5 shows the aggregate change in employment between 1997 and 2001 for those states estimated as having the 10 highest shares of IR displaced workers, as detailed in table 7-1. In all states, aggregate employment grew while employment in textiles and apparel declined. In North Carolina, for example, nearly four jobs were created statewide for every textile and apparel job lost; in South Carolina, nearly three; and in Georgia, Virginia, and New York, more than 10. Thus, many former textile and apparel workers have been looking for, and finding, jobs in relatively strong regional labor markets.

Table 7-5
Aggregate change in employment between 1997 and 2001, selected states

Sector	All nonfarm, except textile and apparel	Textile and apparel
	Thousands	
North Carolina	319.5	-82.0
South Carolina	146.1	-31.0
Mississippi	40.7	-13.7
Rhode Island	41.0	[1]-12.1
Georgia	367.9	-28.7
Tennessee	241.6	-24.1
Puerto Rico	27.1	-8.8
Virginia	317.0	-20.4
New York	557.1	-31.6
Kentucky	117.5	-11.8

[1] Using textile data from 1997-2001 and apparel data from 1997-1999.

Source: USDOL, BLS, "Current Employment Survey," and USITC calculations.

At the local level, labor dislocations in textile, apparel, and other industries may be heavily concentrated in certain counties and metropolitan areas, and may thus induce further labor dislocation in service and other industries serving the general population. The estimates of labor displacement in Chapter 2 and the inferences drawn from those estimates in this chapter do not take such effects into account.

Comparing Transitions in the Model and Survey Data

A variety of potential concerns may be raised about the type of jobs that are taken by workers displaced from sectors that may contract in future trade liberalization. In particular, the actual behavior of displaced workers who switch sectors might differ from the way in which the CGE model reallocates labor as the result of a policy change. For example, it might be the case that the CGE model allocates labor in a way that implies workers are taking jobs for which they might be insufficiently qualified, while in reality workers who are displaced might be compelled to take lower-paying jobs due to an inability to exploit their skills in the old sector. Ideally, this question would be examined by looking at changes in occupation, which is not feasible with the CGE model used in this study. However, it is feasible, and potentially useful, to look at changes in sectors for workers who actually change jobs in the Displaced Workers Survey and compare them to the sectors in which jobs are created in the CGE modeling exercise.

The results of this comparison are presented in table 7-6. Of the IR displaced workers in the "Displaced Workers Survey" who were working at the time of the survey, an estimated 20.3 percent were re-employed in the same industry, 16.4 percent in other IR industries, and 63.3 percent in non-IR industries.[47] Under the conditions of an actual removal of all significant U.S. import restraints, a net movement of labor would occur into sectors that did not contract. Thus, the comparison takes into account only workers who are re-employed in a non-IR sector.

Table 7-6 shows that actual displaced workers in textiles, apparel, and other industries with significant U.S. import restraints are re-employed in sectors quite similar to those in which the model allocates them. This similarity in result is surprising considering that the estimates are generated in two very different ways–one with survey data based on actual workers and one with a simulation exercise using a CGE model. The primary difference is that actual workers displaced from IR sectors are more likely to be re-employed in services than the model estimates, with the model placing a greater percentage in durable manufacturing. This comparison provides an interesting form of model validation, and suggests that at least on a sectoral basis, the worker transitions in the market as simulated in this study are not too different from those experienced by comparable actual workers.

[47] This calculation uses the same sample weights as are employed elsewhere in the analysis in this chapter.

Table 7-6
Sectors absorbing workers displaced from IR sectors,[1] percent

Sector	According to Displaced Workers Survey	According to Table 2-3
Agriculture, forestry, fisheries	2.75	1.15
Mining, extractive industries	0	0.89
Construction	2.71	3.61
Non-durable manufacturing	6.16	5.79
Durable manufacturing	8.88	24.19
Transportation, communications, utilities	5.14	5.65
Wholesale and retail trade	31.54	16.59
Finance, insurance, real estate	4.02	6.22
Other services	38.48	35.92

[1] Estimates from the Displaced Workers' survey apply to workers displaced from an IR sector and currently working in a non-IR sector. Estimates from Table 2-3 include focus sectors with job gains with their appropriate aggregate sector.

Source: USDOL, Displaced Workers Survey, and USITC calculations.

An important caveat to the analysis of the Displaced Workers Survey is that the results presented utilize all observations from IR displaced workers, rather than only those who take up employment in a non-IR sector. In the event of an actual liberalization, there would be a net transfer of labor into non-IR sectors. This transfer could affect the labor market outcomes of the workers displaced either positively or negatively. As the comparison between the Kletzer and the Field/Graham studies suggests, it is not yet clear whether workers who leave textiles, apparel, and other sectors with import restraints for other sectors experience longer or shorter durations of unemployment, or receive better or worse wages, than workers re-employed in their old sectors. Further research on such transition experiences may yield new insights.

APPENDIX A
Request Letter

(Documents not available electronically)

APPENDIX B
Federal Register Notice
and
List of Hearing Participants

Federal Register Notice:

http://dockets.usitc.gov/eol/public/showpage.cgi?room=public&invtype=332&invno=325&invphase=final&seqno=200108160033

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: Third Update

Inv. No.: 332-325

Date and Time: December 4, 2001 - 9:30 a.m.

Sessions were held in connection with the investigation in the Main Hearing Room, 500 E Street, S.W., Washington, D.C.

ORGANIZATION AND WITNESS:

Panel 1

Institute for International Economics

Washington, D.C.

Edward M. Graham, Senior Fellow, Institute for International Economics

Cato Institute

Washington, D.C.

Daniel T. Griswold, Associate Director, Cato Institute

Consumers for World Trade

Washington, D.C.

Robin W. Lanier, Executive Director, Consumers for World Trade

Center for Economic and Policy Research ("CEPR")

Washington, D.C.

Dean Baker, Co-Director, Center for Economic and Policy Research

International Mass Retail Association ("IMRA")

Arlington, VA

Jonathan E. Gold, Director, International Trade Policy, International Mass Retail Association

- MORE -

The Trade Partnership

Washington, D.C.

Laura M. Baughman, President, The Trade Partnership

Panel 2

Chicken of the Sea International

San Diego, CA

Dennis Mussell, President, Chicken of the Sea International

Bumble Bee Seafoods

San Diego, CA

Christopher Lischewski, President, Bumble Bee Seafoods

National Milk Producers Federation

Arlington, VA

Peter Vitaliano, Vice President, Economic Policy and Market Research, National Milk Producers Federation

American Sugar Alliance

Arlington, VA

Jack Roney, Director, Economics and Policy Analysis, American Sugar Alliance

Thompson Coburn

Washington, D.C.

on behalf of

Maritime Cabotage Task Force ("MCTF")

Michael G. Roberts) – OF COUNSEL

APPENDIX C
Textile and Apparel-Related Legislation

TEXTILE AND APPAREL-RELATED LEGISLATION

The Trade and Development Act of 2000

The Trade and Development Act of 2000 authorizes expanded trade benefits for 48 eligible countries in SSA under title I of the AGOA, and for 24 CBERA beneficiary countries under title II of CBTA. In part, the legislation authorizes preferential treatment for imports of certain textiles and apparel from SSA and CBERA countries. The key textile and apparel provisions are summarized in the next section.

African Growth and Opportunity Act

The AGOA authorizes duty-free treatment under the Generalized System of Preferences for imports of qualifying apparel from eligible SSA countries for 8 years beginning on October 1, 2000.[1] The AGOA also provides for the elimination of existing U.S. quotas on qualifying imports of textiles and apparel from eligible SSA countries, and allows imports of such goods from these SSA countries to enter free of quota during the 8-year period.[2] As of April 8, 2002, the United States Trade Representative determined that 16 countries, including Kenya and Mauritius (the only SSA countries subject to U.S. quotas in 2000), Madagascar, South Africa, Lesotho, Ethiopia, Swaziland, Botswana, Malawi, Uganda, Namibia, Zambia, Tanzania, Mozambique, Cameroon, and Ghana have met the requirements for these benefits.[3]

---

[1] The text of the AGOA, AGOA Presidential Proclamation 7350, and AGOA Interim Regulations, 19 *CFR* Parts 10 and 163, may be found at *http://www.otexa.ita.doc.gov/Trade_Act_2000.htm*, Apr. 8, 2002.

[2] As noted earlier, the United States will eliminate quotas on textiles and apparel from all WTO countries as of Jan. 1, 2005. Imports of textiles and apparel from non-WTO countries will continue to be subject to control under section 204 of the Agricultural Act of 1956.

[3] The AGOA authorizes such preferential treatment for qualifying apparel articles from SSA countries, within 30 days after these countries (1) have adopted an effective visa system and related procedures to prevent unlawful transshipments

In general, the AGOA provides for duty-free and quota-free treatment for apparel assembled in SSA countries from U.S. fabrics and yarns.[4] The AGOA also authorizes preferential treatment for a specified amount of imports of apparel made in SSA countries from fabrics that are produced in SSA countries of U.S. or SSA yarns (regional fabrics).[5] A special rule allows apparel entered under the cap from lesser developed SSA countries to be used for the first 4 years, through September 30, 2004.[6] Apparel of regional or third-country fabrics covered by the cap are subject to a surge mechanism, under which the U.S. Secretary of Commerce may suspend duty-free treatment on any such article whenever the Secretary determines that the article is being imported in such increased quantities as to threaten or cause serious damage to the U.S. industry. Section 112(b)(5) of the AGOA allows preferential treatment for apparel made in eligible countries from certain fabrics or yarns that are eligible for preferential treatment, under annex 401 of NAFTA.[7]

---

[3]—*Continued*

and the use of counterfeit documents, and (2) have implemented and followed, or are making substantial progress toward implementing and following, certain customs procedures that assist the U.S. Customs Service in verifying the origin of the products. Federal Register notices for all 16 sixteen countries may be found under Announcement of Eligibility at *http://www.otexa.ita.doc. gov/Trade_Act_2000.htm*, Apr. 8, 2002.

[4] The AGOA also provides SSA countries with preferential treatment for (1) knit-to-shape sweaters in chief weight of cashmere or containing 50 percent or more by weight of wool measuring 18.5 microns in diameter or finer (merino wool), (2) apparel wholly assembled from fabric or yarn not available in commercial quantities in the United States, and (3) handloomed, handmade, and folklore articles.

[5] Imports of such apparel from SSA countries are subject to an annual cap beginning on Oct. 1, 2000, equal to 1.5 percent of the total quantity of U.S. apparel imports in the preceding 12-month period, and rising in each of the seven succeeding 1-year periods in equal increments, to 3.5 percent in the final 1-year period beginning on Oct. 1, 2007. Assuming that all U.S. apparel imports from SSA countries would have entered under the cap in calendar year 1999, the SSA countries would have filled 60 percent of the cap of 212 million square meter equivalents (SMEs), based on total apparel imports of 14.1 billion SMEs and those from SSA countries of 128.2 million SMEs.

[6] The AGOA defines a lesser developed SSA country as one with a per capita gross national product of less than $1,500 in 1998, as measured by the World Bank. All but six SSA countries (Botswana, Gabon, Mauritius, Namibia, Seychelles, and South Africa) meet this definition of a lesser developed country.

[7] Annex 401 includes such fabrics as silk or linen, velveteen or fine-wale corduroy cotton fabrics, and hand-woven Harris tweed wool fabrics, as well as handmade and folklore articles. This section of the AGOA also authorizes the President to proclaim preferential treatment for apparel made of additional fabrics or yarn that the President determines are in "short supply" in the United States or cannot be supplied by the domestic industry in commercial quantities in a timely manner.

United States-Caribbean Basin Trade Partnership Act

The CBTPA provides for duty-free and quota-free treatment for imports of qualifying textile and apparel articles from designated CBERA beneficiary countries during a transition period beginning on October 1, 2000, and ending on September 8, 2008, or on the date on which the Free-Trade Area of the Americas or a comparable free-trade agreement between the United States and CBERA countries enters into force (if this occurs prior to September 8, 2008).[8] The CBTPA authorizes such preferential treatment for qualifying textile and apparel articles from CBERA countries, provided that these countries have implemented and followed, or are making substantial progress toward implementing and following, the customs procedures required by the CBTPA. The preferential treatment is essentially equivalent to that provided under NAFTA for similar goods from Mexico, which competes with CBERA countries for apparel assembly work from U.S. firms. As of April 8, 2002, Barbados, Belize, Costa Rica, the Dominican Republic, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Panama, Saint Lucia, and Trinidad and Tobago had been designated as CBTPA beneficiary countries.

[8] The CBTPA, CBTPA Presidential Proclamation 7351, CBTPA Interim Regulations, 19 *CFR* Parts 10 and 163.

The Act authorizes unlimited preferential treatment for imports of apparel assembled in CBERA countries from fabrics formed and cut in the United States of U.S. yarns. If the U.S. fabrics used in the production of such apparel are cut into garment parts in CBERA countries rather than the United States, the apparel must also be sewn together with U.S. thread. CBERA countries also are eligible to receive unlimited preferential treatment for textile luggage assembled from U.S. fabrics made of U.S. yarns. In addition, section 213(b)(2)(A)(v) of the CBERA, as added by section 211(a) of the CBTPA allows for the same preferential treatment for apparel made in eligible countries from the same fabrics described for the AGOA. The Act also provides for preferential treatment for limited amounts of knit apparel, except socks, made in CBERA countries from fabrics knitted in those countries provided that the fabrics are produced of U.S. yarns (regional knit fabrics).[9]

[9] Knit apparel made in CBERA countries from regional knit fabrics includes garments cut and assembled from knit fabrics or those knit-to-shape directly from yarns (sweaters). This preferential treatment is limited to 4.2 million dozen outerwear T-shirts and 250 million SMEs of other knit apparel, for the 1-year period beginning on Oct. 1, 2000. Both caps are to be increased by 16 percent in each succeeding 1-year period through Sept. 30, 2004, and remain at those levels through Sept. 30, 2008. Preferential treatment is also provided for imports of brassieres from CBERA countries that are cut and sewn or otherwise assembled in the United States or CBERA countries, or both. For the 1-year period beginning on Oct. 1, 2001 and in each of the 6 succeeding 1-year periods, preferential treatment is only granted to producers whose total cost of the U.S. fabric components during the previous 1-year period is at least 75 percent of the aggregate declared customs value of the fabric contained in all of their brassieres entered during that period. In general, preferential treatment is only granted to producers who use mostly U.S. fabric components.

APPENDIX D
USITC Models

USITC MODELS

Introduction

This study employs two modeling frameworks to analyze the impact of trade liberalization on the U.S. economy. When product categories subject to analysis are sufficiently broad, the USITC CGE model of the U.S. economy is used. When the sector identified is substantially narrower than the industry/product categories in the CGE model, a partial equilibrium model is used to assess the impacts of liberalization.

General equilibrium models analyze market interactions within an economy between producers and consumers for goods, services, labor, and physical capital. The distinguishing feature of a general equilibrium model is its economywide coverage, multisectoral linkages and consideration of all flows in the economy. A general equilibrium model explicitly accounts for upstream and downstream production linkages and competition between sectors for labor and capital. In addition, the general equilibrium approach considers the balance of trade, income transfers associated with quotas and tariffs, and economywide resource constraints for labor and capital.[1]

The USITC CGE model used is very similar to the model employed in previous reports and will assess the effect of the elimination of tariffs, quotas, and TRQs. Many of the behavioral and structural parameters of the protected sectors are updated, and some innovations in the model structure have also been incorporated.[2] The most important changes include updating the accounts to be consistent, in aggregate, with the 1999 National Income and Product Accounts, and the incorporation of new data on nontariff protection in the textile, agriculture, and maritime transport sectors. Consequently, the results of this model are not entirely comparable to the results in the previous report.

Partial equilibrium (PE) models generally specify a supply and demand structure for domestic output and for competing imports. PE models typically assume that any linkages between the sector that is analyzed and other sectors in the economy are held constant. In addition, PE models assume no movement of labor and capital between sectors. Therefore, the partial equilibrium approach does not consider any secondary liberalization effects in other sectors such as the changes that could result as capital and labor move from the less productive sectors to the more productive sectors of the economy.

[1] These additional features of general equilibrium models provide a more complete or comprehensive assessment of employment, output, and trade effects of policy changes.

[2] In particular, many of the import substitution elasticities, which describe the degree of substitutability between imports and domestic products, were estimated from new data.

CGE Model

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 significant.

The USITC CGE model has three main components: a social accounting matrix (SAM), a behavioral parameter dataset, and a system of equations that constitute the model specification. The SAM is the empirical database for the CGE that specifies the transactions among the various economic units involved in the U.S. economy for 1999, the base year in this study. The largest part of the SAM is composed of the estimated input-output accounts for 497 sectors in agriculture, mining, manufacturing, and services.[3] These accounts detail the transactions that occur between industrial sectors, such as the purchase of steel by the automotive sector. In addition to 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 1999 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 1999 base year.

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 to a new equilibrium in response to changes in policy parameters. The behavioral parameters are elasticities that specify the percentage change that occurs in an economic variable in response to a 1 percent change in another economic variable. For example, an income elasticity of demand for a good is the percentage change in demand for that good that occurs in response to a 1 percent change in household income. The following types of behavioral parameters are used by the model:

[3] This 497 sector classification is based on 6-digit BEA sectors.

1. Elasticities of substitution between imported and domestic goods;[4]
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.

USITC estimated these parameters using time series data, where possible. In other cases, USITC relied on published studies for estimates. The parameters are included in a behavioral parameter dataset that is continually improved and updated.[5] The elasticities of substitution between imported and domestic goods (Armington elasticities) are presented in table D-1.

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 three general conditions that, once solved simultaneously, represent an Arrow-Debreu competitive general equilibrium.[6] First, all constant returns activities must earn zero profits. All of the production technologies and preferences are represented in these zero-profit conditions.[7] Second, the market for each product must clear such that supply equals demand. The third general condition is that income must balance. In other words, income from endowed factors will be exhausted on final demand.

---

[4] Like most CGE studies, an arbitrary rule is used to eliminate domestic-import complementarities (and other unrealistic characteristics) implied by single equation, direct econometric estimates of the elasticity between domestic and imported goods. The method used here is consistent with that used in the GTAP model. The parameters used in the GTAP model are determined by finding the harmonic mean between the econometric estimates of the elasticity of substitution and a prior belief that the elasticity is 5 (*SALTER: A General Equilibrium Model of the World Economy*, Volume 1, Industry Commission, Canberra, Australia: Industry Commission for the Department of Foreign Affairs and Trade, 1991, p. 97). An additional lower bound of 5/9 is placed on econometric estimates for this study. This ensures that the domestic and foreign varieties are at least Cobb-Douglas substitutes (i.e., a 1 percent rise in price leads to a 1 percent decline in demand, maintaining a constant budget share). Such a rule would not have been binding for the GTAP model, because the SALTER econometric estimates did not fall below 1.

[5] This data set is described in more detail in Kenneth A. Reinert and David W. Roland-Holst, "Parameter Estimates for U.S. Trade Policy," USITC working paper, 1991. The most recent update to the parameters consists of newly estimated elasticities of substitution between imports and domestic products, generated by the Commission made by USITC staff in 2000 and 2001 (USITC Working Papers 2000-09-A and 2001-12-A).

[6] G. Debreu, 1959, *The Theory of Value*, (New York: Wiley, 1959).

[7] Using the analogy in duality theory between cost and expenditure functions, all preferences are captured in a zero-profit condition on the activity that produces utility or welfare.

Table D-1
Sectoral specification for USITC CGE simulations

No.	Sector	Substitution Elasticity
1	Dairy farming	2.5
2	Poultry/eggs farming	2.0
3	Meat animals farming	2.2
4	Cotton farming	2.2
5	Food grain farming	2.2
6	Feed grain farming	2.2
7	Tobacco farming	2.2
8	Sugar crops	2.2
9	Other agricultural products	2.5
10	Forestry, fishing	3.0
11	Mining, mineral resources	1.8
12	Meat products	1.0
13	Poultry products	1.0
14	Creamery butter	1.0
15	Cheese	1.0
16	Dry/condensed/evaporated milk products	1.9
17	Ice cream and frozen deserts	1.7
18	Fluid milk	1.0
19	Prepared feeds, n.e.c.	2.6
20	Wet corn milling	1.2
21	Bread, cake, related products	2.6
22	Cookies, crackers	([1])
23	Frozen bakery products	([1])
24	Sugar manufacturing	1.7
25	Chocolate, cocoa products	1.3
26	Candy, other confectionary	2.7
27	Alcoholic beverages	2.2
28	Soft drink syrup	2.0
29	Food preparations n.e.c.	2.2
30	Coffee	1.1
31	Other food	2.9
32	Tobacco stemming, redrying	1.6
33	Cigarettes	2.7
34	Other tobacco products	1.6
35	Agricultural fertilizers	3.3
36	Agricultural chemicals	1.0

See footnotes at end of table.

Table D-1—*Continued*
Sectoral specification for USITC CGE simulations

No.	Sector	Substitution Elasticity
37	Broadwoven fabric mills and finishing	1.5
38	Narrow fabric mills	1.0
39	Yarn and thread mills	1.6
40	Floor coverings	2.7
41	Miscellaneous textile goods	2.6
42	Knit fabric mills	3.6
43	Apparel	1.7
44	Housefurnishings	1.2
45	Fabric and textile products	2.6
46	Manmade fibers	1.0
47	Luggage and leather goods	3.0
48	Leather gloves and mittens	1.4
49	Frozen fruits, fruit juices, and vegetables	3.5
50	Footwear	1.1
51	Ceramic wall and floor tile	1.7
52	China and earthenware food utensils	2.4
53	Ball and roller bearings	1.8
54	Watches clocks watchcases and parts	1.8
55	Costume jewelry	1.0
56	Fruits and vegetables	2.2
57	Packaging	1.8
58	Leather tanning and finishing	2.2
59	Clay mining	2.8
60	Water transportation	([2])
61	Crude petroleum and natural gas	2.8
62	Chemicals, rubber and plastic	1.6
63	Petroleum refining	2.5
64	Shipbuilding	1.0
65	Construction	([2])
66	Nondurable manufacturing	2.7
67	Durable manufacturing	2.6
68	Transportation, communication	1.9
69	Wholesale and retail trade	([2])
70	Finance, insurance, and real estate	1.9
71	Other services	1.2

[1] No imports reported therefore no Armington.
[2] Nontraded sector.

Source: USITC model.

Current Specification of the USITC CGE Model

The key elements of the USITC CGE model are further divided into four components that define the behavioral relationships: final demand behavior, production technology, factor supplies, and the trade equilibrium. This section also characterizes the extensions to the basic framework that were required to quantify maritime liberalization.

Final Demand Behavior

The USITC CGE model considers three separate components of domestic final demand: household consumption, government demand, and investment demand. Household consumption includes a separable labor-leisure choice and a linear expenditure system (LES) for commodity consumption.[8] The LES is a generalization of the Cobb-Douglas utility function in which the origin is translated such that income elasticities can differ from unity. While the income expansion paths are linear, the displaced origin allows preferences to be nonhomothetic. The separable labor-leisure choice is described in the factor supply section.

In the specification of government demand, real government spending is fixed exogenously. This condition is satisfied by endogenously adjusting government transfers to households. This adjustment assumes that changes in government revenues are compensated through a lump sum tax.

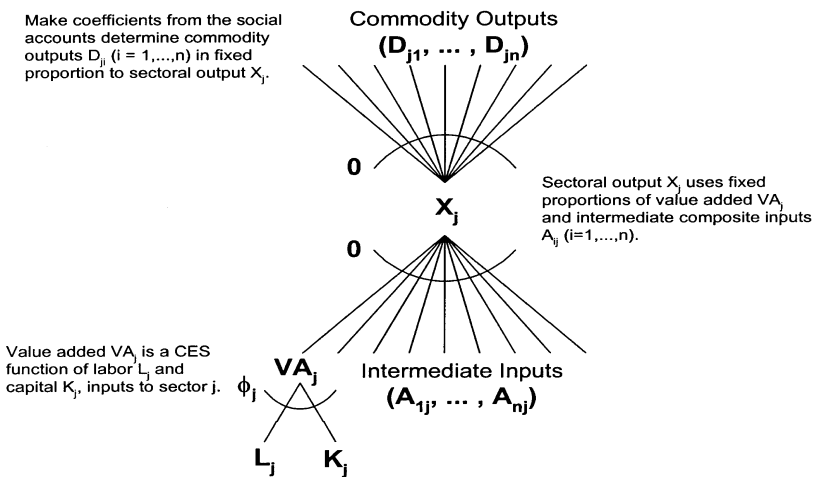
For investment demand, real investment is generally held constant. The one exception to this concerns purchases of oceangoing ships, because of the important investment effects attributable to liberalizing maritime transport. In this case aggregate investment is held fixed by distributing the adjustment to other investment commodities. Holding aggregate investment constant in the specification abstracts from issues of substitution between present and future consumption. This assumption is appropriate for static welfare comparisons.

[8] For an introduction to the LES, see ch. 5 of P. R. G. Layard and A. A. Walters, *Microeconomic Theory* (New York: McGraw-Hill, 1978); ch. 3 of A. Deaton and J. Muellbauer, *Economics and Consumer Behavior* (Cambridge, England: Cambridge University Press, 1980); appendix A.5 of K. Dervis, J. de Melo, and S. Robinson, *General Equilibrium Models for Development Policy* (Cambridge, England: Cambridge University Press, 1982); ch. 11 of E. Silberberg, *The Structure of Economics* (New York: McGraw-Hill, 1990); and ch. 2 of J. W. Chung, *Utility and Production Functions: Theory and Applications* (Cambridge, MA: Blackwell Publishers, 1994).

Production Technology

Production technology is modeled using a nested constant elasticity of substitution (CES) value added function.[9] Figure D-1 illustrates the production technology. At the bottom of the figure, inputs are combined to produce sectoral output X_j. In the value added nest, capital and labor substitute for one another at a rate ϕ_j. Domestic outputs of commodity i produced by sector j, D_{ji}, are produced in fixed proportions according to the make-coefficients in the social accounts. In general, the predominant output for a sector will be in its corresponding commodity, but some sectors will produce other commodities (i.e., broadwoven fabric mills produce primarily broadwoven fabric, but might also produce a small share of commodities classified as miscellaneous textiles). The structure employed here accommodates details on both industries and commodities embedded in the "make" accounts published by the BEA.

Figure D-1
Production in the USITC CGE model



[9] For an introduction to CES production functions, see ch. 9 of P. R. G. Layard and A. A. Walters, *Microeconomic Theory* (New York: McGraw-Hill, 1978); ch. 9 of E. Silberberg, *The Structure of Economics* (New York: McGraw-Hill, 1990); and ch. 9 of J. W. Chung, *Utility and Production Functions: Theory and Applications* (Cambridge, MA: Blackwell Publishers, 1994).

Factor Supplies

It is generally the case in static CGE models that the factors of production–labor and capital–are assumed to be in fixed supply. The model does treat total capital within the economy as fixed. However, labor supply is now endogenous to the model. Labor supply is determined through a household labor-leisure choice. Leisure enters into the household CES utility function, along with the composite LES consumption good. The model parameters include a choice of total discretionary time endowment and the elasticity of substitution between labor and leisure. These are chosen to yield an uncompensated labor supply elasticity of 0.10 and a compensated labor supply elasticity of 0.35.

Trade Equilibrium

Within each commodity category there is a distinction between three types of goods. There are domestic goods destined for domestic consumption (DD_i), domestic goods destined for foreign consumption (EX_i or exports), and foreign goods destined for domestic consumption (IM_i or imports).[10] In each case there is a substitution or transformation parameter that differentiates the goods. Figure D-2 summarizes the structure of product differentiation. Again the figure is structured such that inputs enter at the bottom and outputs are at the top. In the left panel of Figure D-2 the aggregation of domestic and imported goods is illustrated. This is popularly known as an Armington aggregation. The parameter σ_i controls the elasticity of substitution between domestic and imported goods.[11] The resulting output is the composite commodity A_i, which is available for domestic absorption.[12]

U.S. commodity output is illustrated in the right panel of figure D-2. D_i represents total output of commodity i. Total output D_i is then disaggregated into domestic market supply (DD_i) and international market supply (EX_i) according to a constant elasticity of transformation (CET) function. The CET parameter τ_i controls the export supply response.

---

[10] The treatment of traded goods follows J. de Melo 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, (August 1989), pp. 489-97.

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

[12] Domestic absorption is the measure of both intermediate and final demand for a product.

Figure D-2
Product and commodity structure

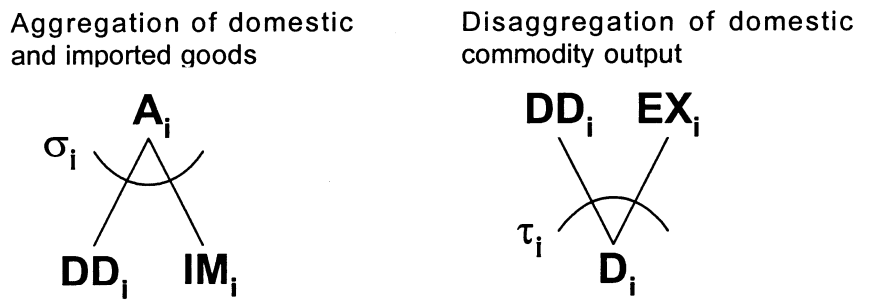


Figure D-2 establishes the sources of export supply and import demand, and the trade equilibrium is completed by defining constant elasticity export demand and import supply functions. By defining these functions, the model characterizes the rest of the world. Exports generate foreign exchange from the rest of the world and foreign exchange is used to purchase imports. The balance of trade is fixed through an exogenous endowment of foreign exchange that equals the benchmark capital flows into the United States.

Maritime Transport Extensions

Modeling the liberalization of cabotage requirements in domestic coastwise shipping presents unique problems that require additional structural extensions of the model. First, domestic coastwise shipping is isolated from other water transport sectors. The production structure (Figure D-1) was slightly modified to include a transportation nest. This modification allows for modal shifts in transportation due to price changes, but the transportation composite is used in fixed proportions to output. The import demand structure presented in Figure D-2 is not appropriate because the initial import share of foreign supplied coastwise service is zero.

As an alternative, a residual rest-of-world supply curve is assumed, which intersects the vertical axis at the measured world cost advantage. Total supply to the U.S. market under liberalization is the horizontal summation of the domestic and the foreign supplies. Normalizing benchmark prices and benchmark domestic output to 1, the domestic supply of coastwise water transportation CWT_d is approximately given by:[13]

[13] The domestic supply function shown here is only valid locally (close to the benchmark). Away from the benchmark general equilibrium effects on input costs change the nature of domestic supply.

$$CWT_d = (P_{CWT})\ \varepsilon.$$

The supply response to a change in the price of coastwise services (P_{CWT}) is given by the supply elasticity ε. Foreign supply available to the U.S. market under liberalization is given by:

$$CWT_f = [P_{CWT} / (PFX * WCF)\ ]^{\varepsilon} - 1.$$

The price of foreign exchange is given by PFX (normalized to 1 at the benchmark) and WCF is the world cost factor. The world cost factor represents the foreign suppliers' marginal cost as a fraction of U.S. domestic costs at the benchmark (supplying zero quantity to the U.S. market). Total supply given a liberalization of the Jones Act equals $CWT_d + CWT_f$. Import penetration as a percent of initial domestic supply is given by CWT_f.

In addition to the incorporation of imported coastwise services, adjustments were made to demand for ships. In the benchmark accounts, new ship purchases are treated as a capital investment, not as an intermediate input to water transportation. Ships are purchased as a part of final demand and then the coastwise service sector makes capital payments as a part of its value added. To incorporate a decrease in the steady-state investment demand for the shipbuilding industry, investment in ships is assumed to be proportional to Jones Act fleet services. As mentioned above, the difference in ship investment is distributed across all other investment demands proportionally so that total investment is unchanged.

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. fiscal and monetary policies as well as economic behavior in foreign countries remained the same? Specifically, the analysis considers what would have happened to the U.S. economy in the base year of 1999 if the import restraints had not been in place. The analysis thus emphasizes the effects of import restraints in isolation from other factors that affect 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. Rather, the analysis provides an assessment of the specific contributions of a policy change, such as the removal of tariffs and quotas.

More technically, the model is first calibrated to the base-year data with the import restraints in place.[14] Correct calibration ensures that when the model solves for the equilibrium prices that equate supply and demand in all markets

[14] Tariffs are taken from official statistics compiled by the USDOC, and the tariff equivalents of quotas are estimated by USITC staff.

and satisfy the accounting identities governing economic behavior, it reproduces the observed 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.

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-year solution, the model reports estimates of the economic effects of removing the specified import restraints. Note that import restraints (and the relief of these restraints) are applied to specific commodities. By distinguishing between industry and commodity output, the model can track the effects of a policy shock back to any industry sectors that may be producing a given commodity.

Often the effects on the significant upstream and downstream sectors that are linked with the liberalized sector are of interest as well.[15] Because of the multisectoral nature of the CGE, which explicitly details interindustry linkages, analysis of the effects of import restraint removal on upstream and downstream sectors is straightforward. Using the matrix representing these linkages, the protected sector's expenditures on goods and services from the other sectors can be determined 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.

In order to conduct the policy simulations for this study, the 497-sector SAM and behavioral parameter dataset are adjusted into a more manageable size. Those individual sectors of interest to the study are left disaggregated, while the remaining sectors are aggregated into broad reference sectors:

1. Agriculture, forestry, and fishing;
2. Mining and mineral resources;
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. Personal, business and public services.

This procedure of aggregating the USITC SAM and behavioral parameter dataset 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 simulation experiments.

[15] 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.

The main outputs 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 reports both absolute and percentage changes in the equilibrium prices and quantities over those calculated in the base period.

The most important output result calculated by the model is the equivalent variation measure of the economic welfare change due to trade liberalization. The equivalent variation is 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. For example, a positive equivalent variation measure is the estimated total dollar amount U.S. households gain from removal of the tariff protection. This measure is a consistent theoretic measure of the change in welfare.[16]

CGE Data

The social accounts used by the USITC CGE model organize the data in a consistent framework of interindustry flows, value added, imports, and final demand for 497 production sectors. The USITC SAM is based on 1999 national accounts data provided by the Bureau of the Census, the most recent (1992) USDOC input-output table available at the time of publication, and 1999 trade flows from the USDOC.[17] The other major inputs into the USITC model are the parameters that represent the behavior of economic agents in the U.S. economy.[18] These parameters are elasticities[19] estimated by the Commission or gathered from published sources.[20] For example, these behavioral parameters include elasticities of substitution between domestic and imported products, income elasticities of demand, and export demand and import supply elasticities.

---

[16] 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 these generate no welfare changes. This, however, requires a strong but common assumption that welfare from government and investment sources are separable from other consumption.

[17] USDOC, BEA, *Benchmark Input-Output Accounts of the United States 1992,* (Washington, DC: U.S. Government Printing Office, Sept. 1993).

[18] Economic agents is a general term that can include consumers, producers, importers, exporters, users and firms.

[19] Elasticities depict the (percentage) change in an economic variable in response to changes in another related variable. For example, the expenditure elasticity contained in the database shows the percentage change in the demand for a particular commodity relative to a 1-percent change in income.

[20] Michael Gallaway, Christine A. McDaniel and Sandra A. Rivera, USITC Working Paper No. 2000-09-A, "Industry-level Estimates of U.S. Armington Elasticities" (2000). These parameters are described in more detail in USITC, *An Introduction to the ITC Computable General Equilibrium Model*, Publication 2423, Washington, DC, Sept. 1991.

Any quantitative analysis of the removal of U.S. import restraints requires measures of the magnitudes of these restraints. Among these restraints, tariffs are readily quantifiable. In addition to import data, the SAM contains the estimated duties collected by the U.S. Treasury from official statistics of the USDOC. For each sector that is analyzed, an average ad valorem rate is calculated using import shares as weights.

Tariff-rate quotas are a type of tariff restraint, with a lower tariff applied to in-quota imports and a higher tariff applied to over-quota imports.[21] Depiction of a TRQ within a model can be challenging, relative to that of a quota. If the over-quota rate is not so high as to prohibit imports, or if imports are significantly below the quota limit, the appropriate tariff rate is used. If the over-quota tariff is prohibitive and the TRQ is binding, then the impact of the TRQ looks like a quota.

Although the quantified effects of binding quotas in the market are difficult to model, one can estimate the tariff equivalent of the binding quota, namely, a tariff that has the same effect on prices and quantities as the quota.[22] For sectors with prohibitive quota levels, a tariff equivalent is estimated and used in the USITC model to analyze the effects of liberalizing that sector.[23] The techniques used in this study to quantify the price premium associated with a particular binding quota are the price-gap method, the cost-push method, and an approach that makes use of license prices.[24]

[21] In the case of agriculture, border measures, including the former U.S. section 22 quotas and the U.S. Meat Import Act, were converted to tariffs (so-called tariffication) under the General Agreement on Tariffs and Trade Uruguay Round Agreements. The tariffication process involved the introduction of tariff-rate quotas, with specified access levels being provided at lower duties (inside of a given tariff-rate quota) and with higher, more restrictive over-quota tariff rates. Even though TRQs have a specified access or quota level, they are generally defined as tariff barriers.

[22] For ease of presentation, this discussion focuses on quotas. However, the same discussion applies to other NTMs that are binding as well as to TRQs when the over-quota rate is prohibitive.

[23] In the case where the over-quota rate of a TRQ is prohibitive, the over-quota rate may be greater than the actual market price that is paid by U.S. consumers. In such a case, the over-quota rate cannot be used in the model because it would overstate the effects of the TRQ. Consequently, tariff equivalents are estimated to reflect actual market prices that existed in 1999.

[24] These techniques are described in detail in the USITC, *Import Restraints: Second Update 1999*, Publication 3201, May 1999, Appendix F.

Tariff equivalents that will be estimated using the price-gap method measure the percentage differential between the U.S. domestic price of a good and the world price of that good. The method assumes that a price differential can be constructed between the domestic and imported goods that is caused entirely by the TRQ, quota or nontariff barrier. The application of the price-gap method depends primarily on the existence of reliable pricing data and will likely be applied to the TRQs on sugar, peanuts, dairy products, and the cabotage restriction on maritime transportation.

Derivation of U.S.-World Price Wedges for Food and Agriculture in the USITC CGE Model

The data for the CGE model are derived from the published input-output (IO) accounts of the U.S. economy. Input-output sectors are usually defined more broadly than product markets. For example, the "cotton" sector in the input-output accounts is broader than cotton fiber (e.g., cotton seeds are included in the IO accounts).

Table D-2 details the computations to derive the price wedges in the CGE model. Since the model is implemented at a level of aggregation corresponding to input-output sectors, the measures of tariffs and implied rest-of-the-world (ROW) export taxes must correspond to that level of aggregation. However, the TRQs and their corresponding price effects usually apply only to a fraction of the imports corresponding to the input-output sector; thus, the ROW export taxes must be converted to levels appropriate to the input-output sector.

For example, the Commission estimated that the U.S. sugar TRQ causes the U.S. price of sugar to be 227 percent higher than its world price. This effect applies to $484 million imports of sugar. Since tariffs on these products amounted to $8 million, the ad valorem tariff rate is 1.65 percent ($8 million/$484 million). The ROW export tax equivalent is figured on the price inclusive of the tariff, and thus amounts to 221.68 percent.[25] This, in turn, implies that the world (non-distorted) value of sugar imports covered by the policy is equal to the tariff-inclusive value of the imports net of the total price wedge, or $150.5 million,[26] and the implied value of the export tax rents associated with the TRQs is $333.5 million ($484 million - $150.5 million).

To convert these values to values appropriate for the level of aggregation used in the model, one begins with aggregate data for the input-output sector containing sugar, which report $737 million of sugar net of duties. On this sugar, $8 million of duties was paid, so the appropriate tariff level to use for the input-output sector is 1.09 percent ($8 million/$737 million). This is the level of tariffs used in the CGE model. Of the $737 million in imports net of tariff, $333.5 million represents the implied value of the export tax associated with the products to which the TRQ applies. Thus, the value of the

[25] (1+2.27)/(1+.0165) - 1 = 2.2168, or 221.68 percent.

[26] ($484 million + $8 million)/(1+2.27) = $150.5 million

Table D-2
Derivation of U.S.-world price wedges for food and agriculture in the USITC CGE model

	Data at input-output sector level					Data at commodity level				
	IO sector number	Imports	Duties collected by U.S.	Estimated U.S. tariff rate	Estimated ROW export tax rate	Imports subject to policy	Duties collected by U.S.	Estimated U.S. tariff rate	Estimated ROW export tax rate	Estimated U.S. world price wedge
		Million dollars		*Percent*		*Million dollars*			*Percent*	
Dairy policies:										
Creamery butter	14.0200	34.6	14.7	42.49	10.02	32.9	14.7	44.68	10.59	60.0
Cheeses	14.0300	738.0	75.0	10.16	15.03	525.0	75.0	14.29	22.50	40.0
Dry/condensed/evaporated dairy products	14.0400	601.0	4.5	0.75	0.75	30.0	4.5	15.00	17.40	35.0
Ice cream, frozen deserts	14.0500	39.0	6.9	17.69	(1)	18.0	3.6	20.00	0	20.0
Fluid milk	14.0600	26.0	1.9	7.31	(1)	17.0	1.7	10.00	0	10.0
Cotton	02.0100	202.0	1.1	0.54	2.00	34.0	1.1	3.24	13.22	16.9
Sugar policies:										
Sugar	14.1900	737.0	8.0	1.09	82.67	484.0	8.0	1.65	221.66	227.0
Food preparations, n.e.c.	14.3202	1768.0	25.7	1.45	0.07	43.8	25.7	58.68	2.74	63.0
Wet corn milling	14.1700	209.0	0.9	0.43	(1)	(1)	(2)	19.00	0	19.0
Chocolate, cocoa	14.2002	993.0	13.5	1.36	(1)	9.1	2.8	31.00	0	31.0
Candy	14.2005	772.0	16.5	2.14	(1)	(3)	0.01	25.00	0	25.0
Roasted coffee	14.2800	629.0	0.3	0.05	0.05	4.0	0.3	7.50	7.93	16.0
Tobacco stemming and redrying	15.0200	446.0	39.0	8.74	(1)	270.0	27.0	10.00	0	10.0

1 Less than 0.005 percent.
2 Duties collected less than $5,000.
3 Imports less than $500,000.

Source: USITC calculations based on USITC dataweb and USDOC, BEA, *Benchmark Input-Output Accounts of the United States, 1992* (Washington, DC: U.S. Government Printing Office, Sept. 1998).

input-output sector's sugar at world prices amounts to $737 million - $333.5 million = $403.5 million. The implied ROW export tax applying to the input-output sector is $333.5 million/$403.5 million, or 82.66 percent. This is the value of the ROW export tax used in the CGE model. Calculations for the other sectors are conducted in an analogous manner.

Partial Equilibrium Model

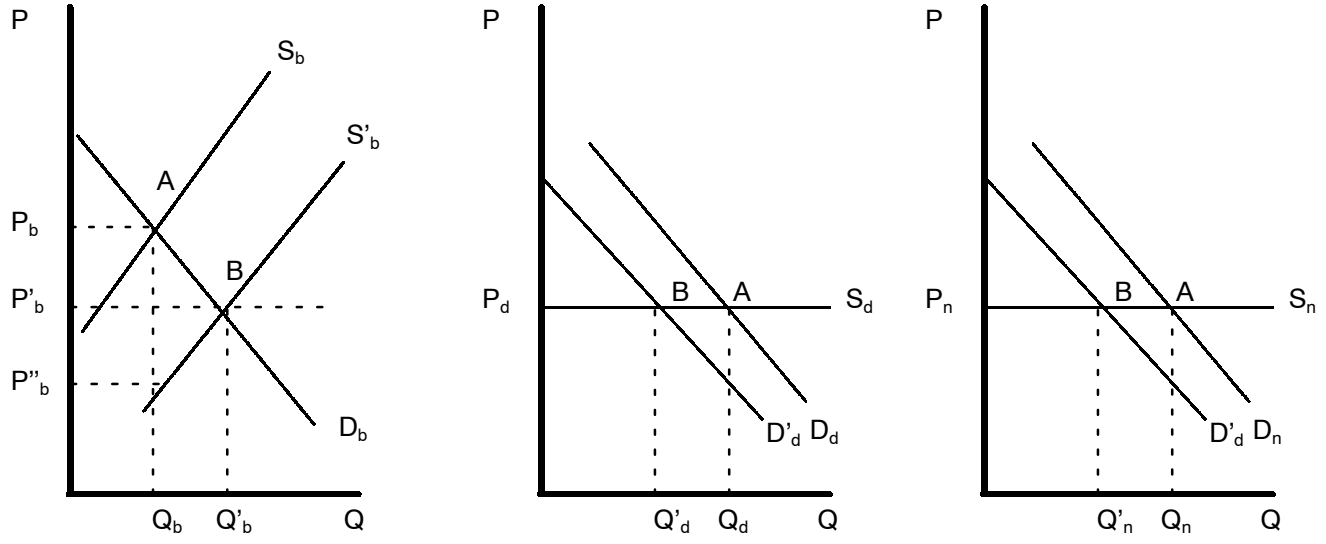
This section discusses the partial equilibrium framework used to simulate the impact of import barriers for peanuts, canned tuna, and lamb meat. The modeling framework is the Commercial Policy Analysis System (COMPAS), a partial-equilibrium trade model which has been developed by the USITC.

In particular, the following illustrates the behavior of the COMPAS model in the case of granting a product Generalized System of Preferences (GSP) duty-free status. The illustration is for a product for which domestic production, GSP imports, and non-GSP imports are imperfect substitutes, and shows the basic results of a tariff removal on a portion of imports.

Consider the market for imports from country A, as illustrated in figure D-3, panel (a). The line labeled D_b is the U.S. demand for imports from country A, the line labeled S_b is the supply of imports from country A with the tariff in place, and the line labeled S_b' is the supply of imports from country A without the tariff (i.e., the product is receiving duty-free treatment under GSP). Point A is the equilibrium with the tariff in place, and point *B* is the equilibrium without the tariff. Q_b and Q_b' are equilibrium quantities at *A* and *B*, respectively. P_b and P_b' are equilibrium prices at *A* and *B*, and P_b is the price received by country A producers when the tariff is in place. The difference between P_b' and P_b denotes the tariff, t.

In the model, a tariff reduction leads to a decrease in the price of the import good and an increase in sales of the import good in the United States. The lower consumer price paid for the import in the United States leads to a reduction in the demand for U.S. production of the good, and for imports from non-GSP countries, as consumers substitute towards the lower priced import and away from the domestic and nonbeneficiary imports. These demand shifts, along with supply responses to the lower demand, lead to the reduction in U.S. output and non-GSP imports. The magnitude of these shifts is determined by the degree of sensitivity to price changes, such as the demand elasticity, supply elasticity, and the degree of substitutability between domestic and imported goods.

Figure D-3
Effect of eliminating a tariff for GSP beneficiary imports: U.S. markets for GSP beneficiary imports (panel a), domestic production (panel b), and nonbeneficiary imports (panel c)



The changes that take place in panel (a) lead to the changes seen in panels (b) and (c), where the demand curves shift from D_d and D_n to D'_d and D'_n, respectively. Equilibrium quantity in the market for domestic production moves from Q_d to Q'_d, and in a similar manner for the market for nonbeneficiary imports, equilibrium quantity falls from Q_n to Q'_n.

Derivation of Import, U.S. Production, and Consumer Effects

The basic building blocks of the model are shown below. Armington shows that if consumers have well-behaved constant elasticity of substitution (CES) utility functions, demand for a good in a product grouping can be expressed as follows:

$$q_i = b_i^{\sigma} q \left(\frac{p_i}{p} \right)^{-\sigma} \tag{1}$$

where q_i denotes quantity demanded for good i in the U.S. market;[27] p_i is the price of good i in the U.S. market; σ is the elasticity of substitution for the product grouping; q is the demand for the aggregate product (that is, all goods in the product grouping); p is a price index for the aggregate product (defined below); and b_i^{σ} is a constant.[28] The above equation can be derived as follows. The aggregate price index p is defined as:

$$p = \left(\sum_i b_i^{\sigma} p_i^{1-\sigma} \right)^{\frac{1}{1-\sigma}} . \tag{2}$$

In addition the aggregate quantity index q can be defined as

$$q = k_A p^{\eta_A} , \tag{3}$$

[27] The product grouping consists of similar goods from different sources. For example, goods i, j, and k would indicate three similar goods from three different sources. See Armington (1969) for further discussion of the concept.

[28] Armington (1969), p. 167.

where K_A is a constant and η_A is the aggregate demand elasticity for the product grouping (natural sign). Substituting equation (3) into equation (1) yields:

$$q_i = b_i^{\sigma} k_A p^{\eta_A} \left(\frac{p_i}{p} \right)^{-\sigma} .$$

Further manipulation and simplification yields:

$$q_i = b_i^{\sigma} k_A \frac{p^{(\sigma+\eta_A)}}{p_i^{\sigma}} ,$$

which establishes the demand for q_i in terms of prices, elasticities, and constants.

The supply of each good in the product grouping is represented in constant supply elasticity form:

$$q_i = K_{si} p_i^{\varepsilon_{si}} ,$$

where K_{si} is a constant and ε_{si} is the price elasticity of supply for good i.

Excess supply functions are set up for each good in the product grouping with the following general form:

$$K_{si} p_i^{\varepsilon_{si}} - b_i^{\sigma} k_A \frac{p^{\sigma+\eta_A}}{p^{\sigma}} = 0. \qquad (4)$$

The model is calibrated using initial trade and production data and setting all internal prices to unity in the benchmark calibration. It can be shown that calibration yields $K_{si} = b_i^{\sigma} k_A$ for the i^{th} good so that equation (4) can be rendered as:

$$p_i^{\varepsilon_{si}} - \frac{p^{\sigma+\eta_A}}{p_i^{\sigma}} = 0 \ . \qquad (4')$$

If there are n goods, the model consists of n equations like (4′) plus an equation for the price aggregator p, which are solved simultaneously for prices by an iterative technique.

For the case of adding a product to the list of products eligible for GSP duty-free treatment, the equations are as follows:

$\left[p_b(1+t)\right]^{\varepsilon_{sb}} - \frac{p^{\sigma+\eta_A}}{p_b^{\sigma}} = 0$ for imports from GSP beneficiary countries,

$p_n^{\varepsilon_{sn}} - \frac{p^{\sigma+\eta_A}}{p_n^{\sigma}} = 0$ for imports from nonbeneficiary countries,

$p_d^{\varepsilon_{sd}} - \frac{p^{\sigma+\eta_A}}{p_d^{\sigma}} = 0$ for U.S. domestic production, and

$p = \left(\sum_{i=b,n,d} b_i^{\sigma} p_i^{1-\sigma} \right)^{\frac{1}{1-\sigma}}$ for the price aggregator.

The prices obtained in the solution to these equations are used to calculate trade and production values, and resulting percentage changes in total imports and domestic production are computed relative to the original (benchmark) import and production values.

Consumer Effects

Consumer effects are estimated in terms of the portion of the duty reduction that is passed on to U.S. consumers on the basis of the import demand and supply elasticity estimates. The formula for determining the division of the duty savings between U.S. consumers and foreign exporters is approximated by $SV = \frac{\eta_{ii}}{(\eta_{ii} - \varepsilon_{si})}$, where SV is the percentage of duty savings retained by exporters from source i, η_{ii} is the own-price elasticity of demand,[29] and ε_{si} is the price elasticity of supply from source i.

Data

The elasticities used in this analysis are shown in appendix table D-3. In addition to the supply and demand elasticities, the COMPAS model requires the value of imports and domestic sales by U.S. producers in 1999 for each of the products examined. Those data are presented in tables 4-4, 4-15, and 4-18.

[29] At any given vector of prices, such as at the benchmark equilibrium, is the own-price elasticity of demand from imports from source i, where S_i is the share of total expenditures on the product grouping spent on good i at that vector of prices. See Armington, p. 175.

Table D-3
Elasticities values used in USITC partial equilibrium analysis

Sector	U.S. own-price supply elasticity	Imports supply elasticity	U.S. own-price demand elasticity	Armington elasticity substitution for imports v. domestic
Peanuts	[1]0.55	[2]2.0	[3]-0.14	[5]2.2
Canned tuna	0.80	[2]2.0	[4]-0.5893	[5]2.2
Lamb meat	[1]0.80	[2]2.0	[1]-0.7	[5]2.2

[1] Appendix table 2 in Thomas W. Hertel, Everett B. Peterson, and James V. Stout, *Adding Value to Existing Models of International Agricultural Trade*, Technical Bulletin No. 1833, USDA, ERS, August 1994.

[2] Ralph Seeley, *Price Elasticities from the IIASA World Agriculture Model*, Staff Report No. AGES850418, USDA, ERS May 1985.

[3] Randal R. Rucker, and Walter Thurman, "The Economic Effects of Supply Controls: The Simple Analytics of the U.S. Peanut Program," *Journal of Law and Economics*, Vol. XXXIII, October 1990.

[4] Table 4.3 in Thomas W. Hertel, editor, *Global Trade Analysis: Modeling and Applications,* (Cambridge, England: Cambridge University Press, 1997).

[5] Table 4.1 in Thomas W. Hertel, editor, *Global Trade Analysis: Modeling and Applications,* (Cambridge, England: Cambridge University Press: 1997).

Source: Constructed by USITC from publications listed in footnotes 1 through 5 above.

APPENDIX E
Measures of Nontariff Barriers

MEASURES OF NONTARIFF BARRIERS

Estimation Approach

As discussed in detail in chapter 3, U.S. textile and apparel imports are restricted by both tariffs and quotas.[1] Both of these restrictions raise the price of these products in the United States. However, because the quotas are in the form of VERs, the exporting country is able to capture this price premium, known as a rent, by raising the export price of the product. Thus, in effect, the VER generates an implicit export tax on these products. In what follows, the procedures used for estimating the ETEs reported in chapter 3 are described. Products will refer only to textile and apparel products. Of those products, the ones considered are those facing binding quota constraints under the ATC.[2]

Prices for each imported product, defined by MFA quota categories, in the U.S. market were assumed to take the following form: [3]

$$P_{USij} = C_{ij}(1 + v_{ij})(1 + t_i) \quad (1)$$

where: i denotes product (MFA quota classification); j denotes exporting country; t_i is the *ad valorem* tariff; v_{ij} is the ETE of the quota; C_{ij} denotes cost per unit of good i from country j; P_{USij} denotes the consumer price in the U.S. market. Since the ad valorem tariffs are known, the ETEs of the quotas could be calculated if one had information on prices (by product and by exporting country) in the U.S. market, and on costs of production (by product and by exporting country).

[1] See chapter 3 for a full discussion of VERs and quotas.

[2] Chapter 3 discusses the criteria used to determine which quota constraints were binding.

[3] The ATC replaced the MFA but retained its quota category classification.

Estimation Method for ETEs on Imports from China, India, and Hong Kong

As discussed in chapter 3, the methodology chosen for this study relies on license price data to measure the gap between actual production costs and free-on-board (f.o.b.) prices in the U.S. market.[4] License price data were available for China, Hong Kong and India. Export tax equivalents for India were obtained in percent from the original source, but were constructed in a similar manner to that described below for China and for Hong Kong.[5] From monthly or biweekly license price data,[6] an average 1999 license price was calculated for each product (*i*) imported from China and from Hong Kong. Estimated production costs, or supply price net of rent (C_{ij}), were calculated as the difference between the f.o.b. export price to the U.S. market (P^*_{USij})[7] and the license price per unit (L_{ij})[8]:

$$C_{ij} = P^*_{USij} - L_{ij} \quad (2)$$

The ETEs for all products imported from China and Hong Kong were then calculated as:

$$v_{ij} = L_{ij} / C_{ij} \quad (3)$$

[4] Chapter 3 discusses a number of the limitations of relying on license price data alone to capture the increase in price due to VERs.

[5] Indian ETEs were obtained from Sanjay Khaturia and Anjali Bhardwaj, "The Export Tax Equivalents of Quota Restrictions in the Indian Textile and Garment Industries," World Bank Working Paper, 2001. Note that Indian textile ETEs were available for 1996 only.

[6] Chinese data are from *www.chinaquota.com*, Oct. 11, 2000; Hong Kong data were provided electronically by Alvaro Ferreira, International Business and Economic Research Corporation, Oct. 9, 2001.

[7] F.o.b. unit values, measured in 1999 U.S. dollars, were used to proxy price. They were calculated from U.S. import data provided by USDOC, Office of Textiles and Apparel, reported in *Major Shippers Reports*, December 1999. The values and quantities of U.S. imports are reported on a "customs value" basis, and are equivalent to the f.o.b. designation for exports.

[8] Chinese license prices were in 1999 U.S. dollars. Hong Kong average license prices were converted from Hong Kong dollars into U.S. dollars, using the 1999 average exchange rate. See International Monetary Fund. International Financial Statistics, CD-Rom, 2001. All quantities were measured in square meter equivalents (SMEs).

Estimation Method for ETEs on Imports from all Other Exporting Countries[9]

Apparel

Because 1999 license price data are unavailable for all other exporting countries facing binding quota constraints under the ATC, license prices were imputed from the Chinese data using a method developed by Yang.[10] Since the Japanese market for textiles and apparel is free of QRs, the assumption is made that the ratio of the price of Japanese imports of good *i* from country *j* to the price of Japanese imports of good *i* from China, reflects the relative production costs of these goods in a free market. If this is the case, then C_{ij} for all other exporting countries could be approximated by multiplying Chinese C_{ij} by the relative price ratio prevailing in the Japanese market.

Value and quantity data for Japanese imports of all relevant goods from each country *j* were obtained from the United Nations Harmonized System Merchandise trade data and unit values were calculated at the HS 6-digit level.[11] These unit values were then import-weighted and aggregated to determine an average unit value for each MFA quota category for each exporting country.[12] To better approximate the relative costs of the bundle of goods imported by the United States, country-specific import weights based on

---

[9] Other exporting countries include Bangladesh, Costa Rica, Dominican Republic, El Salvador, Guatemala, Indonesia, Macao, Malaysia, Mauritius, Nepal, Pakistan, Philippines, Poland, Romania, Singapore, South Korea, Sri Lanka, Taiwan, Thailand, and Turkey.

[10] Yongzheng Yang, "The Impact of MFA Phasing Out on World Clothing and Textile Markets," *The Journal of Development Studies*, vol. 30, No. 4, 1994, pp. 892-915.

[11] These data are from USDOC, Trade Policy Information System (TPIS) Database, *http://tpis3.ita.doc.gov*, retrieved on several occasions from Dec. 3, 2001 through Mar. 6, 2002.

[12] A concordance between MFA classification and HS-10 digit classification is available from USDOC's Office of Textiles and Apparel. Because Japanese data are reported at the HS 6-digit level only, this was modified to concord to HS-6 digit classifications, and may, therefore, imply that some goods were missclassified. The Japanese data also had to be converted from c.i.f. to customs value by deflating by the margins between the two values. Margins are available by good, but not by exporting country, hence, this adjustment is only approximate. The margins were obtained from Mark Gelhar, ERS, USDA. For a full discussion, see Mark Gelhar, "Bilateral transportation margins," in Robert A. McDougall, Aziz Elberhri, and Truong Truong, eds., *Global Trade, Assistance, and Protection: The GTAP 4 Data Base*. Center for Global Trade Analysis, available at *http://www.gtap.agecon.purdue.edu/products/*.

U.S. imports at HS 6-digit level were used.[13] The relative cost of Japanese imports of product *i* from country *j* and product *i* from China (RC^{J}_{ijc}) were then calculated as:

$$RC^{J}_{ijc} = (UV^{J}_{ij} / UV^{J}_{ic}) \quad (4)$$

where: UV_{ij}^{J} is the unit value of good *i* from country *j* in Japan, and UV_{ic}^{J} is the unit value of good *i* from China in Japan.

To test the performance of this estimator, the RC^{J}_{ijc} calculated from Japanese data were compared with the actual relative cost ratios (calculated from equation (2)) for India and China and for Hong Kong and China. The estimated relative cost was close to actual relative cost, when actual relative cost was close to 1. However, the estimated relative cost tended to exceed (fall short of) the actual relative cost when *j*'s costs were much lower (higher) than China's. These systematic errors in prediction were positively correlated with differences in the standard deviations of the Japanese unit values at the HS 6-digit level between country *j* and China. To correct this, the estimated relative cost ratio, RC^{J}_{ijc}, was deflated by a function of the ratio of the standard deviations of UV_{ij}^{J} and UV_{ic}^{J}.[14]

The estimated cost of good *i* from country *j* (in U.S. dollars) was then calculated as:

$$\hat{C}^{J}_{ij} = C_{ic} \cdot RC^{J*}_{ijc}) \quad (5)$$

[13] For some products, some tariff lines showed no Japanese imports. In these cases, U.S. import weights were reallocated proportionately across lines with positive imports within that MFA product category.

[14] The deflated estimator and the actual relative cost ratios had the same mean, standard deviation, and similar maximum and minimum values. The errors now had a mean of zero and a smaller standard deviation, but retained the pattern of overprediction and underprediction. However, due to the standard deviation correction, unit values based on a single HS 6-digit Japanese observation dropped out. For a few products, such as cotton hosiery, this prevented estimation of an ETE. In other cases it prevented the estimation of ETEs for certain goods from certain exporting countries, such as the Central American producers in the sample. The deflated estimator still produced some cost estimates that exceeded U.S. unit values in some cases. This implied negative license prices and negative ETEs. For all *j* where this was true, the ETE of a similar producer of that good was assigned. In a small number of products, for some countries, an estimate from a similar producer was not available, and no ETE could be assigned with credibility. In these cases an ETE of zero was implicitly assigned.

where: ^ indicates estimated value, C_{ic} is cost of U.S. imports of good i from China in U.S dollars, and * indicates the deflated estimator. The $\hat{C}_{ij}$ were then used to calculate the estimated license price for U.S. imports of product i from country j:

$$\hat{L}_{ij} = P_{USij} - \hat{C}_{ij} \tag{6}$$

Finally, the estimated ETE on U.S. imports of good i from country j was then calculated as:

$$\hat{v}_{ij} = \hat{L}_{ij} / \hat{C}_{ij} \tag{7}$$

Aggregation from MFA classification to the BEA apparel group required that a weighted average ETE for each good i across all exporting countries be constructed:

$$\hat{V}_i = \Sigma_{j\,(} w_{ij} \bullet v_{ij)} \tag{8}$$

where: w_{ij} is the share of U.S. imports of good i from country j. The ETE estimates from (8) are likely to be biased downward for several reasons. First, equation (8) assumes that unrestricted countries are not pricetakers, and therefore do not raise their prices to match those earned by the restricted group. Second, Mexican ETEs were set to zero due to NAFTA, despite three products which appeared to face binding constraints. Third, the w_{ij} in (8) were calculated over all restricted suppliers of good i. Thus, missing observations (where no credible ETE could be assigned) were implicitly assigned an ETE of zero.

The weighted average ETE for the BEA apparel group was then calculated as:

$$V_A = SH_i \bullet \hat{V}_i \tag{10}$$

where SH_i is the share of apparel product i in the value of all U.S. apparel imports in the group. V_A is likely to be biased downward, because the SH_i are calculated over the entire group of products, thus implicitly assigning a zero value to any missing ETE_i, such as cotton hosiery. The final ETE reported for apparel in chapter 3 was reduced to $0.93V_A$, since the value of imports included in the MFA apparel group was only 93 percent of the value of imports included in the BEA apparel group.

Textiles

Actual 1999 licence price data for textiles are available only for China. Since Khaturia and Bhardwaj suggest that Indian ETEs in general have

increased since 1996, the 1996 Indian ETEs were treated as lower bound proxies for 1999. License prices for textiles from Hong Kong were assumed to be close to zero.[15] Because actual license price data from at least two countries are critical for assessing the performance of the previous method, an alternative method was used to impute ETEs for textile imports.

For each bound MFA product, the percent of U.S. imports which was restricted (RES_i) was calculated, as well as the share of restricted imports from China, Hong Kong, and India. A weighted ETE for these three countries as a group was calculated, with weights in proportion to each of these countries' shares of restricted imports.[16] The average ETE for each textile product was then computed by: (1) assigning all other restrained exporters (as a group) one half the average ETE earned by China, India, and Hong Kong as a group; (2) weighting each group by its share of restricted trade in that product; and (3) multiplying each average ETE by the value of restricted imports as a percent of total U.S. imports of that product.

There are two reasons why such an estimate is likely to be biased downward. First, other restricted countries are assumed to earn much smaller premia than China, India or Hong Kong, regardless of their share of U.S. imports of each product. Second, if India, China, and Hong Kong collectively have a zero-license price for a product, it is assumed that all other countries have a zero-license price, regardless of their share of U.S. imports of that product.

Aggregation to the textile product groups designated by the USDOC, BEA was undertaken using a concordance between MFA, HS 10-digit, and BEA classifications.[17] The average ETE calculated at the MFA product level was weighted by that product's share of U.S. imports in the total MFA imports assigned to each BEA group.[18] The resulting ETE for each BEA group was then weighted by the share of MFA products in the total value of imports in each BEA group.[19]

---

[15] License price data for Hong Kong from 2000 to the present can be retrieved from *http://garmets.tdctrade.com/*. As of Mar. 15, 2002, there did not appear to be positive license prices for textile exports to the United States listed on that site. In several recent studies, Dean Spinanger argues that Hong Kong only earns significant rents on apparel exports. In "With Rags to Riches but Then What?" manuscript prepared for the Fourth Annual Conference on Global Economic Analysis (2001), Dean Spinanger and Joseph Francois put the overall ETE for Hong Kong textile exports at 1 percent.

[16] This is likely to produce a lower bound estimate for these three countries since the ETEs for India are underestimated, and the ETEs for Hong Kong are set to zero.

[17] Compiled by the Commission.

[18] A few MFA products appeared in several BEA groups. The value of imports in each of these MFA goods, *i,* was divided across BEA groups in proportion to the HS (10 digit) lines within the MFA good, appearing in the BEA group.

[19] For example, the MFA products classified as "carpets and rugs" constituted 96 percent of the value of products included in the BEA group "carpets and rugs." Thus, the average ETE for that group was multiplied by 96 percent. This may represent an additional source of downward bias in the estimates.

APPENDIX F
Statistical Procedures for Transition Effects Analysis

STATISTICAL PROCEDURES FOR TRANSITION EFFECTS ANALYSIS

Introduction

This appendix briefly describes some of the details of the statistical methods of the Displaced Workers Survey in Chapter 7 of this report, including sample sizes, test statistics, and procedures for weighting observations.

Statistical Methods

The samples used in the analysis of the Displaced Workers Survey vary according to the number of respondents to each question, and whether or not they fall in a particular category, such as displaced workers or import-restraints displaced workers (table F-1).

Difference-of-means tests are performed using the method described in Robert V. Hogg and Elliot A. Tanis, *Probability and Statistical Inference* (New York: Macmillan, 1977), p. 250, and difference-of-proportions tests are performed using the method described in Hogg and Tanis, p. 193. Observations for samples of all displaced workers are weighted using the variable PWSUPWGT, as provided by the Bureau of Labor Statistics. Observations for samples of IR displaced workers are weighted so that the weight of each industry within the sample equals the estimated number of displaced FTE workers reported in Chapter 2 of this investigation, when that number is positive. Within each industry, observations are weighted by PWSUPWGT. An alternate weighting scheme for IR displaced FTE workers assigning equal weights to every observation in an industry gave similar results, and is not reported.

Table F-1
Sample Sizes For Hypothesis Tests

Question	All displaced workers	IR displaced workers
Length of completed spell of unemployment	4,966	289
Probability of rehire	6,225	415
Wage change between lost job and current job	1,669	117
Age	11,692	440
Hispanic	11,692	440
Education	11,692	440
Marital Status	11,692	440
Race	11,692	440
Sex	11,692	440
Advance notice of displacement	11,692	430
Job tenure	6,285	428
Reason for displacement	6,285	440
Did you move?	6,439	435
Did you receive unemployment compensation?	6,343	431
Union membership	6,424	436
Labor force status	11,692	440
If female	5,591	215
If female, married, spouse present	2,929	120

Source: Displaced Workers' Survey, BLS, USDOL, found at *www.bls.census.gov/cps/dispwkr/dispwkr.htm*, retrieved Dec. 31, 2001.

APPENDIX G
Mapping Between BEA Classifications and USITC Model Sectors

Mapping Between BEA Classifications and USITC Model Sectors

Aggregate and Macro Model Sectors

Agriculture

dairy	Dairy farm products
poultry	Poultry and eggs
livestck	Meat animals
cotton	Cotton
foodgrn	Food grains
feedgrn	Feed grains
tobacco	Tobacco
sugrcrop	Sugar crops
othrag	Other agriculture products
forfsh	Forestry and commercial fishing products
mining	Mining
meatprod	Meat packing and other prepared meats
poltprod	Poultry dressing plants
butter	Creamery butter
cheeses	Cheese natural and processed
drymilk	Dry condensed and evaporated milk
icecream	Ice cream and frozen deserts
milk	Fluid milk
prepfeed	Prepared feeds, n.e.c.
wetcorn	Wet corn milling
bread	Bread cake and related products
cookies	Cookies and crackers
frzbakry	Frozen bakery products and bread
sugarman	Sugar manufacturing
chocolat	Chocolate and cocoa products
candy	Candy and other confection
alcbevg	Alcoholic beverages
sdnksyrp	Bottled and canned soft drinks, flavoring extracts and syrups, n.e.c.
fprepnec	Food preparations, n.e.c.
coffee	Roasted coffee
othrfood	Other food products, n.e.c.
tobcstem	Tobacco stemming and redrying
cigarets	Cigarettes
tobcprod	Cigars, chewing and smoking tobacco
agfert	Fertilizers and mixings
agchem	Agricultural chemicals, n.e.c.

Textiles

bwvmills	Broadwoven fabric mills
narmills	Narrow fabric mills
yntmills	Yarn and thread mills
carptrug	Floor coverings
msctxgds	Miscellaneous textile goods
knfbmils	Knit fabric mills
apparel	Apparel, including only apparel made from purchased materials
hsfurn	Home furnishings, including curtains and draperies
fabtxprd	Other fabricated textile products
mmfibers	Manmade fibers
lugnlthr	Luggage, handbags, purses and other leather goods
lthglove	Leather gloves

Peak Sectors

frozfrut	Frozen fruits, fruit juices, and vegetables
footwear	Footwear
cermtile	Ceramic wall and floor tile
tablware	Table and kitchenware
bearings	Ball and roller bearings
timepces	Watches, clocks, watchcases, and parts
costjewl	Costume jewelry
frtveg	Fruits and vegetables
package	Packaging
lthrtan	Leather tanning and finishing
clay	Clay, ceramic and refactory minerals, mining

Jones Act

watertrn	Water transportation
crudeext	Crude petroleum and natural gas
chemrp	Industrial inorganic and organic chemicals
petroref	Petroleum refining
shipbuld	Shipbuilding and repairing

Aggregate "Rest of the Economy" Sectors

construct	Construction
ndurmfg	Nondurable manufacturing
durmfg	Durable manufacturing
trcomut	Transportation and communication
trade	Wholesale and retail trade
fininsre	Finance, insurance, and real estate
services	Services

Factors and Institutions

labor	Labor
property	Property
enterprise	Enterprise
household	Household
government	Government
capital	Capital
row	Rest of the World
rowtaxes	Rest of the World taxes

Model mapping between BEA Sectors and ITC model Sectors

I010100 . dairy	Dairy farm products
I010200 . poultry	Poultry and eggs
I010301 . livestck	Meat animals
I010302 . livestck	Miscellaneous livestock
I020100 . cotton	Cotton
I020201 . foodgrn	Food grains
I020202 . feedgrn	Feed grains
I020203 . othrag	Grass seeds
I020300 . tobacco	Tobacco
I020401 . frtveg	Fruits
I020402 . othrag	Tree nuts
I020501 . frtveg	Vegetables
I020502 . sugrcrop	Sugar crops
I020503 . othrag	Miscellaneous crops
I020600 . othrag	Oil bearing crops
I020701 . othrag	Forest products
I020702 . othrag	Greenhouse and nursery products
I030001 . forfsh	Forestry products
I030002 . forfsh	Commercial fishing
I040001 . services	Agricultural forestry and fishery services
I040002 . services	Landscape and horticultural services
I050001 . mining	Iron and ferroalloy ores mining
I060100 . mining	Copper and ore mining
I060200 . mining	Nonferrous metal ores mining except copper
I070000 . mining	Coal mining
I080001 . crudeext	Crude petroleum and natural gas
I090001 . mining	Dimension crushed and broken stone mining and qua
I090002 . mining	Sand and gravel mining
I090003 . clay	Clay ceramic and refractory minerals mining
I090004 . mining	Nonmetalic mineral services and miscellaneous mine
I100000 . mining	Chemical and fertilizer mineral mining
I110101 . construct	New nonfarm residential structures, single unit
I110102 . construct	New nonfarm residential structures, 2-4 unit
I110105 . construct	Nonfarm residential additions
I110108 . construct	New apartments
I110400 . construct	New highways, bridges
I110501 . construct	New farm residences
I110601 . construct	Petroleum and natural gas drilling
I110602 . construct	Petroleum, gas, mineral exploration
I110603 . construct	Mining access buildings
I110800 . construct	New office, industrial, and commerical buildings
I110900 . construct	Other new construction
I120101 . construct	Maintenance and repair, residential
I120214 . construct	Maintenance and repair, highway
I120215 . construct	Maintenance and repair, petroleum and gas wells
I120300 . construct	Other maintenance repair
I130100 . durmfg	Guided missiles and space vehicles

I130200 . durmfg	Ammunition, except for small arms, n.e.c.
I130300 . durmfg	Tank and tank components
I130500 . durmfg	Small arms
I130600 . durmfg	Small arms ammunition
I130700 . durmfg	Other ordnance and accessories
I140101 . meatprod	Meat packing plants
I140102 . meatprod	Sausages and other prepared meats
I140105 . poltprod	Poultry dressing plants
I140200 . butter	Creamery butter
I140300 . cheeses	Cheese, natural and processed
I140400 . drymilk	Dry, condensed, and evaporated milk
I140500 . icecream	Ice cream and frozen deserts
I140600 . milk	Fluid milk
I140700 . othrfood	Canned and cured sea foods
I140800 . othrfood	Canned specialties
I140900 . othrfood	Canned fruits and vegetables
I141000 . othrfood	Dehydrated food products
I141100 . othrfood	Pickles sauces and salad dressings
I141200 . othrfood	Fresh or frozen packaged fish
I141301 . frozfrut	Frozen fruits, fruit juices, and vegetables
I141302 . othrfood	Frozen specialties
I141401 . othrfood	Flour and other grain mill products
I141402 . othrfood	Cereal breakfast foods
I141403 . othrfood	Blended and prepared flour
I141501 . othrfood	Dog, cat and other pet food
I141502 . prepfeed	Prepared feeds, n.e.c.
I141600 . othrfood	Rice milling
I141700 . wetcorn	Wet corn milling
I141801 . bread	Bread, cake and related products
I141802 . cookies	Cookies and crackers
I141803 . frzbakry	Frozen bakery products and bread
I141900 . sugarman	Sugar manufacturing
I142002 . chocolat	Chocolate and cocoa products
I142004 . othrfood	Salted, roasted nuts and seeds
I142005 . candy	Candy and other confection
I142101 . alcbevg	Malt beverages
I142102 . alcbevg	Malt
I142103 . alcbevg	Wine, brandy, and brandy spirits
I142104 . alcbevg	Distilled liquor except brandy
I142200 . sdnksyrp	Bottled and canned soft drinks
I142300 . sdnksyrp	Flavoring extracts and syrups, n.e.c.
I142400 . othrfood	Cottonseed oil mills
I142500 . othrfood	Soybean oil mills
I142600 . othrfood	Vegetable oil mills, n.e.c.
I142700 . othrfood	Animal and marine fats and oils
I142800 . coffee	Roasted coffee
I142900 . othrfood	Shortening and cooking oils
I143000 . othrfood	Manufactured ice
I143100 . othrfood	Macaroni and spaghetti
I143201 . othrfood	Potato chips and the like
I143202 . fprepnec	Food preparations, n.e.c.

I150101 . cigarets	Cigarettes
I150102 . tobcprod	Cigars
I150103 . tobcprod	Chewing and smoking tobacco
I150200 . tobcstem	Tobacco stemming and redrying
I160100 . bwvmills	Broadwoven fabric mills and finishing
I160200 . narmills	Narrow fabric mills
I160300 . yntmills	Yarn mills and finishing of textiles, n.e.c.
I160400 . yntmills	Thread mills
I170100 . carptrug	Floor coverings
I170600 . msctxgds	Coated fabrics, not rubberized
I170700 . msctxgds	Tire cord and fabric
I170900 . msctxgds	Cordage and twine
I171001 . msctxgds	Nonwoven fabrics
I171100 . msctxgds	Textile goods, n.e.c.
I180101 . apparel	Women's hosiery, except socks
I180102 . apparel	Hosiery, n.e.c.
I180201 . knfbmils	Knit outerwear mills
I180202 . knfbmils	Knit underwear mills
I180203 . knfbmils	Knitting mills, n.e.c.
I180300 . knfbmils	Knit fabric mills
I180400 . apparel	Apparel made from purchased materials
I190100 . hsfurn	Curtains and draperies
I190200 . hsfurn	House furnishings, n.e.c.
I190301 . fabtxprd	Textile bags
I190302 . fabtxprd	Canvas and related products
I190303 . fabtxprd	Pleating and stitching
I190304 . fabtxprd	Automotive and apparel trimmings
I190305 . fabtxprd	Schiffli machine embroideries
I190306 . fabtxprd	Fabricated textile products, n.e.c.
I200100 . durmfg	Logging camps and logging contractors
I200200 . durmfg	Sawmills and planing mills, general
I200300 . durmfg	Hardwood dimension and flooring mills
I200400 . durmfg	Special product sawmills, n.e.c.
I200501 . durmfg	Millwork
I200502 . durmfg	Wood kitchens and cabinets
I200600 . durmfg	Veneer and plywood
I200701 . durmfg	Structural wood members, n.e.c.
I200702 . durmfg	Prefabricated wood buildings
I200703 . durmfg	Mobile homes
I200800 . durmfg	Wood preserving
I200901 . durmfg	Wood pallets and skids
I200903 . durmfg	Particle board
I200904 . durmfg	Wood products, n.e.c.
I210000 . durmfg	Wood containers
I220101 . durmfg	Wood household furniture
I220102 . durmfg	Household furniture, n.e.c.
I220103 . durmfg	Wooden TV and radio cabinets
I220200 . durmfg	Upholstered household furniture
I220300 . durmfg	Metal household furniture
I220400 . durmfg	Mattresses and bedsprings
I230100 . durmfg	Wood office furniture

I230200 . durmfg	Metal office furniture
I230300 . durmfg	Public building furniture
I230400 . durmfg	Wood partitions and fixtures
I230500 . durmfg	Metal partitions and fixtures
I230600 . durmfg	Drapery hardware, and blinds and shades
I230700 . durmfg	Furniture and fixtures, n.e.c.
I240100 . ndurmfg	Pulp mills
I240400 . ndurmfg	Envelopes
I240500 . ndurmfg	Sanitary paper products
I240701 . ndurmfg	Paper coating and glazing
I240702 . ndurmfg	Bags, except textile
I240703 . ndurmfg	Die-cut paper and board
I240705 . ndurmfg	Stationery products
I240706 . ndurmfg	Converted paper products, n.e.c.
I240800 . ndurmfg	Paper mills except building papers
I250000 . package	Paperboard containers and boxes
I260100 . ndurmfg	Newspapers
I260200 . ndurmfg	Periodicals
I260301 . ndurmfg	Book publishing
I260302 . ndurmfg	Book printing
I260400 . ndurmfg	Miscellaneous publishing
I260501 . ndurmfg	Commercial printing
I260601 . ndurmfg	Manifold business forms
I260602 . ndurmfg	Blankbooks and looseleaf binders
I260700 . ndurmfg	Greeting card publishing
I260802 . ndurmfg	Bookbinding and related work
I260803 . ndurmfg	Typesetting
I260806 . ndurmfg	Platemaking services
I270100 . chemrp	Industrial inorganic and organic chemicals
I270201 . agfert	Nitrogenous and phosphatic fertilizers
I270202 . agfert	Fertilizers mixing only
I270300 . agchem	Agricultural chemicals, n.e.c.
I270401 . chemrp	Gum and wood chemicals
I270402 . chemrp	Adhesives and sealants
I270403 . chemrp	Explosives
I270404 . chemrp	Printing ink
I270405 . chemrp	Carbon black
I270406 . chemrp	Chemical preparations, n.e.c.
I280100 . chemrp	Plastics materials and resins
I280200 . chemrp	Synthetic rubber
I280300 . mmfibers	Manmade fiber
I280400 . mmfibers	Organic fibers, noncellulosic
I290100 . ndurmfg	Drugs
I290201 . ndurmfg	Soap and other detergents
I290202 . ndurmfg	Polishes and sanitation goods
I290203 . ndurmfg	Surface active agents
I290300 . ndurmfg	Toilet preparations
I300000 . ndurmfg	Paints and allied products
I310101 . petroref	Petroleum refining
I310102 . petroref	Lubricating oils and greases
I310103 . petroref	Products of petroleum and coal, n.e.c.

I310200 . petroref	Paving mixtures and blocks
I310300 . petroref	Asphalt felts and coatings
I320100 . chemrp	Tires and inner tubes
I320200 . footwear	Rubber and plastics footwear
I320300 . chemrp	Fabricated rubber products, n.e.c.
I320400 . chemrp	Miscellaneous plastic products
I320500 . chemrp	Rubber and plastic hose and belting
I320600 . durmfg	Gaskets packing and sealing devices
I330001 . lthrtan	Leather tanning and finishing
I340100 . lthrtan	Boot and shoe cut stock and bindings
I340201 . footwear	Shoes, except rubber
I340202 . footwear	House slippers
I340301 . lthglove	Leather gloves and mittens
I340302 . lugnlthr	Luggage
I340303 . lugnlthr	Women's handbags and purses
I340304 . lugnlthr	Personal leather goods
I340305 . ndurmfg	Leather goods, n.e.c.
I350100 . durmfg	Glass and glass products, except containers
I350200 . durmfg	Glass containers
I360100 . durmfg	Cement, hydraulic
I360200 . durmfg	Brick and structural clay tile
I360300 . cermtile	Ceramic wall and floor tile
I360400 . durmfg	Clay refractories
I360500 . durmfg	Structural clay products, n.e.c.
I360600 . durmfg	Vitreous plumbing fixtures
I360701 . tablware	Vitreous china food utensils
I360702 . tablware	Fine earthenware food utensils
I360800 . durmfg	Porcelain electrical supplies
I360900 . durmfg	Pottery products, n.e.c.
I361000 . durmfg	Concrete block and brick
I361100 . durmfg	Concrete products, n.e.c.
I361200 . durmfg	Ready-mixed concrete
I361300 . durmfg	Lime
I361400 . durmfg	Gypsum products
I361500 . durmfg	Cut stone and stone products
I361600 . durmfg	Abrasive products
I361700 . durmfg	Asbestos products
I361900 . durmfg	Mineral, ground or treated
I362000 . durmfg	Mineral wool
I362100 . durmfg	Nonclay refractories
I362200 . durmfg	Nonmetalic mineral products, n.e.c.
I370101 . durmfg	Blast furnaces and steel mills
I370102 . durmfg	Electrometallurgical products
I370103 . durmfg	Steel wire and related products
I370104 . durmfg	Cold finishing of steel shapes
I370105 . durmfg	Steel pipe and tubes
I370200 . durmfg	Iron and steel foundries
I370300 . durmfg	Iron and steel forgings
I370401 . durmfg	Metal, heat treated
I370402 . durmfg	Primary metal products, n.e.c.
I380100 . durmfg	Primary copper

I380400 . durmfg	Primary aluminum
I380501 . durmfg	Primary nonferrous metals, n.e.c.
I380600 . durmfg	Secondary nonferrous metals
I380700 . durmfg	Copper rolling and drawing
I380800 . durmfg	Aluminum rolling and drawing
I380900 . durmfg	Nonferrous rolling and drawing, n.e.c.
I381000 . durmfg	Nonferrous wire drawing and insulating
I381100 . durmfg	Aluminum castings
I381200 . durmfg	Brass, bronze, and copper castings
I381300 . durmfg	Nonferrous castings, n.e.c.
I381400 . durmfg	Nonferrous forgings
I390100 . durmfg	Metal cans
I390200 . durmfg	Metal barrels, drums, and pails
I400100 . durmfg	Metal sanitary ware
I400200 . durmfg	Plumbing fixture fittings and trim
I400300 . durmfg	Heating equipment, except electric
I400400 . durmfg	Fabricated structural metal
I400500 . durmfg	Metal doors sash and trim
I400600 . durmfg	Fabricated plate work (boiler shops)
I400700 . durmfg	Sheet metal work
I400800 . durmfg	Architectural and ornamental metal work
I400901 . durmfg	Prefabricated metal buildings and components
I400902 . durmfg	Miscellaneous structural metal work
I410100 . durmfg	Screw machine products, bolts, etc.
I410201 . durmfg	Automotive stampings
I410202 . durmfg	Crowns and closures
I410203 . durmfg	Metal stampings, n.e.c.
I420100 . durmfg	Cutlery
I420201 . durmfg	Hand and edge tools, except machine tools and handsaws
I420202 . durmfg	Saw blades and handsaws
I420300 . durmfg	Hardware, n.e.c.
I420401 . durmfg	Plating and polishing
I420402 . durmfg	Coating engraving and allied services, n.e.c.
I420500 . durmfg	Miscellaneous fabricated wire products
I420700 . durmfg	Steel springs, except wire
I420800 . durmfg	Pipe valves and pipe fittings
I421000 . package	Metal foil and leaf
I421100 . durmfg	Fabricated metal products, n.e.c.
I430100 . durmfg	Turbines and turbine generator sets
I430200 . durmfg	Internal combustion engines, n.e.c.
I440001 . durmfg	Farm machinery and equipment
I440002 . durmfg	Lawn and garden equipment
I450100 . durmfg	Construction machinery and equipment
I450200 . durmfg	Mining machinery, except oil field
I450300 . durmfg	Oil and gas field machinery and equipment
I460100 . durmfg	Elevators and moving stairways
I460200 . durmfg	Conveyors and conveying equipment
I460300 . durmfg	Hoists, cranes, and monorails
I460400 . durmfg	Industrial trucks and tractors
I470100 . durmfg	Machine tools, metal cutting types

I470200 . durmfg	Machine tools, metal forming types
I470300 . durmfg	Special dies and tools and machine tool accessories
I470401 . durmfg	Power-driven handtools
I470402 . durmfg	Rolling mill machinery and equipment
I470404 . durmfg	Electric and gas welding, and soldering equipment
I470405 . durmfg	Industrial patterns
I470500 . durmfg	Metalworking machinery, n.e.c.
I480100 . durmfg	Food products machinery
I480200 . durmfg	Textile machinery
I480300 . durmfg	Woodworking machinery
I480400 . durmfg	Paper industries machinery
I480500 . durmfg	Printing trades machinery and equipment
I480600 . durmfg	Special industry machinery, n.e.c.
I490100 . durmfg	Pumps and compressors
I490200 . bearings	Ball and roller bearings
I490300 . durmfg	Blowers and fans
I490500 . durmfg	Mechanical power transmission equipment
I490600 . durmfg	Industrial process furnaces and ovens
I490700 . durmfg	General industrial machinery and equipment, n.e.c.
I490800 . durmfg	Packaging machinery
I500100 . durmfg	Carburetors, pistons, rings, and valves
I500200 . durmfg	Fluid power equipment
I500300 . durmfg	Scales and balances except laboratory, n.e.c.
I500400 . durmfg	Industrial and commercial machinery and equipment, n.e.c.
I510102 . durmfg	Calculating and accounting machines
I510103 . durmfg	Electronic computers
I510104 . durmfg	Computer peripheral equipment
I510400 . durmfg	Office machines, n.e.c.
I520100 . durmfg	Automatic vending machines
I520200 . durmfg	Commercial laundry equipment
I520300 . durmfg	Refrigeration and heating equipment
I520400 . durmfg	Measuring and dispensing pumps
I520500 . durmfg	Service industry machinery, n.e.c.
I530200 . durmfg	Power distribution and specialty transformers
I530300 . durmfg	Switchgear and switchboard apparatus
I530400 . durmfg	Motors and generators
I530500 . durmfg	Relays and industrial controls
I530700 . durmfg	Carbon and graphite products
I530800 . durmfg	Electrical industrial apparatus, n.e.c.
I540100 . durmfg	Household cooking equipment
I540200 . durmfg	Household refrigerators and freezers
I540300 . durmfg	Household laundry equipment
I540400 . durmfg	Electric housewares and fans
I540500 . durmfg	Household vacuum cleaners
I540700 . durmfg	Household appliances, n.e.c.
I550100 . durmfg	Electric lamp bulbs and tubes
I550200 . durmfg	Lighting fixtures and equipment
I550300 . durmfg	Wiring devices
I560100 . durmfg	Household audio and video equipment
I560200 . durmfg	Prerecorded records and tapes

I560300 . durmfg	Telephone and telegraph apparatus
I560500 . durmfg	Communication equipment
I570100 . durmfg	Electron tubes
I570200 . durmfg	Semiconductors and related devices
I570300 . durmfg	Other electronic components
I580100 . durmfg	Storage batteries
I580200 . durmfg	Primary batteries, dry and wet
I580400 . durmfg	Electrical equipment for internal combustion engines
I580600 . durmfg	Magnetic and optical recording media
I580700 . durmfg	Electrical machinery equipment and supplies, n.e.c.
I590100 . durmfg	Truck and bus bodies
I590200 . durmfg	Truck trailers
I590301 . durmfg	Motor vehicles and passenger car bodies
I590302 . durmfg	Motor vehicle parts and accessories
I600100 . durmfg	Aircraft
I600200 . durmfg	Aircraft and missile engines and engine parts
I600400 . durmfg	Aircraft and missile equipment, n.e.c.
I610100 . shipbuld	Ship building and repairing
I610200 . durmfg	Boat building and repairing
I610300 . durmfg	Railroad equipment
I610500 . durmfg	Motorcycles bicycles and parts
I610601 . durmfg	Travel trailers and campers
I610603 . durmfg	Motor homes
I610700 . durmfg	Transportation equipment, n.e.c.
I620101 . durmfg	Search and navigation equipment
I620102 . durmfg	Laboratory apparatus and furniture
I620200 . durmfg	Mechanical measuring devices
I620300 . durmfg	Environmental controls
I620400 . durmfg	Surgical and medical instruments and apparatus
I620500 . durmfg	Surgical appliances and supplies
I620600 . durmfg	Dental equipment and supplies
I620700 . timepces	Watches, clocks, watchcases, and parts
I620800 . durmfg	X-ray apparatus and tubes
I620900 . durmfg	Electromedical and electrotherapeutic apparatus
I621000 . durmfg	Laboratory and optical instruments
I621100 . durmfg	Instruments to measure electricity
I630200 . durmfg	Ophthalmic goods
I630300 . durmfg	Photographic equipment and supplies
I640101 . durmfg	Jewelry precious metal
I640102 . durmfg	Jewelers materials and lapidary work
I640104 . durmfg	Silverware and plated ware
I640105 . costjewl	Costume jewelry
I640200 . durmfg	Musical instruments
I640301 . durmfg	Games, toys, and children vehicles
I640302 . durmfg	Dolls and stuffed toys
I640400 . durmfg	Sporting and athletic goods, n.e.c.
I640501 . durmfg	Pens, mechanical pencils, and parts
I640502 . durmfg	Lead pencils and art goods
I640503 . durmfg	Marking devices
I640504 . durmfg	Carbon paper and inked ribbons
I640700 . durmfg	Fasteners, buttons, needles, and pins

I640800 . durmfg	Brooms and brushes
I640900 . durmfg	Hard surface floor coverings, n.e.c.
I641000 . durmfg	Burial caskets
I641100 . durmfg	Signs and advertising specialties
I641200 . durmfg	Manufacturing industries, n.e.c.
I650100 . trcomut	Railroads and related services
I650200 . trcomut	Local and suburban transit and interurban highway passenger transit
I650301 . trcomut	Trucking and courier services, except air
I650302 . trcomut	Warehousing and storage service
I650400 . watertrn	Water transportation
I650500 . trcomut	Air transportation
I650600 . trcomut	Pipelines, except natural gas
I650701 . trcomut	Freight forwarders and other transportation services
I650702 . trcomut	Arrangement of passenger transportation
I660100 . trcomut	Telephone telegraph comms and communication services, n.e.c.
I660200 . trcomut	Cable and other pay television services
I670000 . trcomut	Radio and TV broadcasting
I680100 . trcomut	Electric services (utilities)
I680201 . trcomut	Natural gas transportation
I680202 . trcomut	Natural gas distribution
I680301 . trcomut	Water supply and sewerage systems
I680302 . trcomut	Sanitary services steam supply and irrigation systems
I690100 . trade	Wholesale trade
I690200 . trade	Retail trade, except eating and drinking
I700100 . fininsre	Banking
I700200 . fininsre	Credit agencies, other than banks
I700300 . fininsre	Security and commodity brokers
I700400 . fininsre	Insurance carriers
I700500 . fininsre	Insurance agents,k brokers, and services
I710100 . fininsre	Owner-occupied dwellings
I710201 . fininsre	Real estate agents, managers, operators, and lessors
I710202 . services	Royalties
I720101 . services	Hotels
I720102 . services	Other lodging places
I720201 . services	Laundry cleaning garment services and shoe repair
I720202 . services	Funeral service and crematories
I720203 . services	Portrait photographic studios and other miscellaneous personal services
I720204 . services	Electrical repair shops
I720205 . services	Watch, clock, jewelry, and furniture repair
I720300 . services	Beauty and barber shops
I730101 . services	Miscellaneous repair shops
I730102 . services	Services to dwellings and other buildings
I730103 . services	Personnel supply services
I730104 . services	Computer and data processing services
I730106 . services	Detective and protective services
I730107 . services	Miscellaneous equipment rental and leasing
I730108 . services	Photo finishing labs and commercial photography
I730109 . services	Other business services

I730111 . services	Management and public relations services
I730112 . services	Research development and testing services, except noncommercial
I730200 . services	Advertising
I730301 . services	Legal services
I730302 . services	Engineering, architectural, and surveying services
I730303 . services	Accounting, auditing, and bookkeeping and miscellaneous services, n.e.c.
I740000 . services	Eating and drinking places
I750001 . services	Automotive rental and leasing without drivers
I750002 . services	Automotive repair shops and services
I750003 . services	Automobile parking and car washes
I760101 . services	Motion picture services and theaters
I760102 . services	Video tape rental
I760201 . services	Theatrical producers (except motion picture), bands, orchestras, and entertainment
I760202 . services	Bowling centers
I760203 . services	Professional sports clubs and promoters
I760204 . services	Racing, including track operation
I760205 . services	Physical fitness facilities and membership sports and recreation clubs
I760206 . services	Other amusement and recreation services
I770100 . services	Doctors and dentists
I770200 . services	Hospitals
I770301 . services	Nursing and personal care facilities
I770303 . services	Home health care services
I770304 . services	Veterinary services
I770305 . services	Other medical and health services
I770401 . services	Elementary and secondary schools
I770402 . services	Colleges, universities, and professional schools
I770403 . services	Private libraries, vocational schools, and educational services, n.e.c.
I770501 . services	Business associations and professional membership organizations
I770502 . services	Labor organizations, civic, social, and fraternal associations
I770503 . services	Religious organizations
I770504 . services	Other membership organizations
I770600 . services	Job training and related services
I770700 . services	Child day-care services
I770800 . services	Residential care
I770900 . services	Social services, n.e.c.
I780100 . services	U.S. Postal Service
I790100 . services	State and local government passenger transit
I790200 . services	State and local government electric utilities
I790300 . services	Other State and local government enterprises
I800000 . services	Noncomparable imports
I810001 . services	Scrap
I810002 . services	Used and second-hand goods
I820000 . services	General government industry
I830001 . services	Rest of the World adjustment to final uses
I840000 . services	Household industry

labor . labor 492
property . property 493
enterprise . enterprise 494
household . household 495
government . government 496
capital . capital 497
row . row 498
rowtaxes . rowtaxes 499