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The Economic Effects of Significant U.S. Import Restraints

U. S. International Trade Commission

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Abstract
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The United States is one of the world's most open economies. In 2010, the average U.S. tariff on all goods remained near its historic low of 1.3 percent, on an import-weighted basis, essentially unchanged from the previous update in 2009. Nonetheless, significant restraints on trade remain in certain sectors. The U.S. International Trade Commission (Commission) estimates that U.S. economic welfare, as defined by total public and private consumption, would increase by about $2.6 billion annually by 2015 if the United States unilaterally ended ("liberalized") all significant restraints quantified in this report. Exports would expand by $9.0 billion and imports by $11.5 billion. These changes would result from removing import barriers in the following sectors: sugar, ethanol, canned tuna, dairy products, tobacco, textiles and apparel, and other high-tariff manufacturing sectors.

As in previous updates, the simulations presented in this report measure the effects of unilateral liberalization of U.S. import restraints (i.e., the simulations assume that U.S. trading partners do not engage in any reciprocal liberalization). However, the effects on the U.S. economy can differ significantly when both the United States and its trading partners engage in reciprocal liberalization.

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The Economic Effects of Significant U.S. Import Restraints

Seventh Update 2011

Special Topic: Global Supply Chains

Investigation No. 332-325

United States
International Trade
Commission

August 2011

U.S. International Trade Commission

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Acting Director of Economics

Address all communications to
Secretary to the Commission
United States International Trade Commission
Washington, DC 20436

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Project Leader
William Powers
William.Powers@usitc.gov

Deputy Project Leader
José Signoret
Jose.Signoret@usitc.gov

Office of Industries
Jonathan Coleman, Kimberlie Freund, Eric Forden, John Fry,
John Kitzmiller, Deborah McNay, Douglas Newman,
Joann Peterson, Laura Rodriguez, George Serletis, and Falan Yinug

Office of Economics
William Deese, Rebekah Esmaili, Michael Ferrantino, Alan Fox,
Jared Fronk, Kyle Johnson, Nathanael Snow, Edward Wilson, and Zhi Wang

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Office of Publishing

With Special Assistance from
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Under the Direction of
Hugh M. Arce, *Chief*
Research Division

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ACRONYMS

3PLs	third-party logistics service providers
AAFA	American Apparel and Footwear Association
AGOA	African Growth and Opportunity Act
AMS	Agricultural Marketing Service (USDA)
ASA	American Sugar Alliance
ASEAN	Association of Southeast Asian Nations
ATC	Agreement on Textiles and Clothing (WTO quota system, expired 2005)
ATPA	Andean Trade Preference Act
AVE	ad valorem equivalent
BEA	U.S. Bureau of Economic Analysis
BLS	U.S. Bureau of Labor Statistics
BOI	board of investment
CAFTA-DR	Dominican Republic-Central America Free Trade Agreement
CBERA	Caribbean Basin Economic Recovery Act
C.F.R.	Code of Federal Regulations
CGE	computable general equilibrium
c.i.f.	cost, insurance and freight
CMT	cut, make, trim (apparel production process)
CPI	consumer price index
CRT	cathode ray tube
CTV	color television
CY	calendar year
DEIP	Dairy Export Incentive Program
EAA	Express Association of America
EDI	electronic data interchange
EFTA	European Free Trade Association
EIA	U.S. Energy Information Administration (USDOE)
EPA	U.S. Environmental Protection Agency
ERS	Economic Research Service (USDA)
EU	European Union
FAS	Foreign Agricultural Service (USDA)
FAPRI	Food and Agricultural Policy Research Institute
FDI	foreign direct investment
FLC	foreign legal consultant
FPD	flat-panel display
FTA	free trade agreement
GATS	General Agreement on Trade in Services
GDP	gross domestic product
GSP	Generalized System of Preferences
GTAP	Global Trade and Analysis Project (Purdue University)
GVC	global value chain
HTS	Harmonized Tariff Schedule of the United States
HFCS	high-fructose corn syrup
ICT	information and communications technology
IDE-JETRO	Institute of Developing Economies–Japan External Trade Organization
I-O	input-output

ACRONYMS—*Continued*

IMF	International Monetary Fund
IT	information technology
ITA	U.S. International Trade Administration (USDOC)
LCD	liquid crystal display
MNC	multinational company
MPC	milk protein concentrate
MTB	Miscellaneous Tariff Bill
mt	metric tons
mtrv	metric tons, raw value
MY	marketing year (previous October through stated year September)
NAFTA	North American Free Trade Agreement
NAICS	North American Industry Classification System
NASS	National Agricultural Statistics Service (USDA)
n.e.c.	not elsewhere classified
NDM	nonfat dry milk
NMPF	National Milk Producers Federation
NTR	normal trade relations
ODC	other duty or charge (fuel ethanol imports)
ODM	original design manufacturer
OECD	Organisation for Economic Co-operation and Development
PTA	preferential trading agreement
R&D	research and development
RFP	Renewable Fuel Program
RFS	Renewable Fuel Standard
ROO	rules of origin
SCP	sugar-containing products
SITC	Standard International Trade Classification
SMEs	small and medium-sized enterprises
strv	short tons, raw value (sugar)
SUA	Sweeteners Users Association
TRQ	tariff-rate quota
USAGE	U.S. Applied General Equilibrium (economic model)
USA-ITA	United States Association of Importers of Textiles and Apparel
U.S.C.	United States Code
USDA	U.S. Department of Agriculture
USDHS	U.S. Department of Homeland Security
USDOC	U.S. Department of Commerce
USDOE	U.S. Department of Energy
USDOL	U.S. Department of Labor
USDOS	U.S. Department of State
USITC	U.S. International Trade Commission
USTR	U.S. Trade Representative
VEETC	volumetric ethanol excise tax credit
WCO	World Customs Organization
WTO	World Trade Organization

Executive Summary

This is the seventh update of *The Economic Effects of Significant U.S. Import Restraints.* Since the first of these studies was published nearly 20 years ago, U.S. tariff rates have fallen, nontariff measures on imports have been removed, and trade has expanded markedly. This period has also seen increasing U.S. integration into global supply chains, the subject of a special topic in this report.

The United States is one of the world's most open economies. In 2010, the average U.S. tariff on all goods remained near its historic low of 1.3 percent, on an import-weighted basis, essentially unchanged from the previous update in 2009. Nonetheless, significant restraints on trade remain in certain sectors. The U.S. International Trade Commission (Commission) estimates that U.S. economic welfare, as defined by total public and private consumption, would increase by about $2.6 billion annually by 2015 if the United States unilaterally ended ("liberalized") all significant restraints quantified in this report. Exports would expand by $9.0 billion and imports by $11.5 billion. These changes would result from removing import barriers in the following sectors: sugar, ethanol, canned tuna, dairy products, tobacco, textiles and apparel, and other high-tariff manufacturing sectors.[1]

As in previous updates, the simulations presented in this report measure the effects of unilateral liberalization of U.S. import restraints (i.e., the simulations assume that U.S. trading partners do not engage in any reciprocal liberalization). However, the effects on the U.S. economy can differ significantly when both the United States and its trading partners engage in reciprocal liberalization.

Effects of Significant Import Restraints

As in previous updates, the Commission used an economic model of the U.S. economy to analyze the economic effects of removing significant U.S. import restraints. The Commission identified sectors with significant import restraints on the basis of high tariff rates, restrictive tariff-rate quotas (TRQs), and other restrictive import policies, such as preferential rules of origin (table ES.1).[2] Among agricultural products, the most restrictive restraints are currently applied to sugar and dairy products such as butter and cheese. Among manufactured goods, the most restrictive restraints are in the apparel, footwear, and leather sectors.

Removal of All Significant Restraints

As noted above, the Commission estimates that simultaneous liberalization of all significant import restraints quantified in this report would increase annual domestic welfare by $2.6 billion by 2015 (table ES.2). This result is consistent with recent Commission studies in this series of the gains available from liberalization: the Commission's estimates have trended downward as U.S. tariffs and quantitative restraints

[1] These include footwear and leather products; glass and glass products; ball and roller bearings; ceramic tile; china tableware; costume jewelry; writing instruments; hand tools; tires; and pesticides and agricultural chemicals.

[2] Generally, preferential rules of origin for textiles and apparel under FTAs and trade preference programs give special customs treatment to imported textiles and apparel made with selected inputs originally from the United States and/or partner countries.

TABLE ES.1 Sectors with significant restraints

Broad sector	Selection criteria		
	High tariffs	Restrictive TRQs	Other[a]
Dairy	☒	☒	☐
Ethanol	☒	☐	☒
Sugar	☐	☒	☐
Tuna	☒	☒	☐
Tobacco	☒	☒	☐
Textiles and apparel	☒	☐	☒
Other manufacturing sectors	☒	☐	☐

Source: Commission estimates.

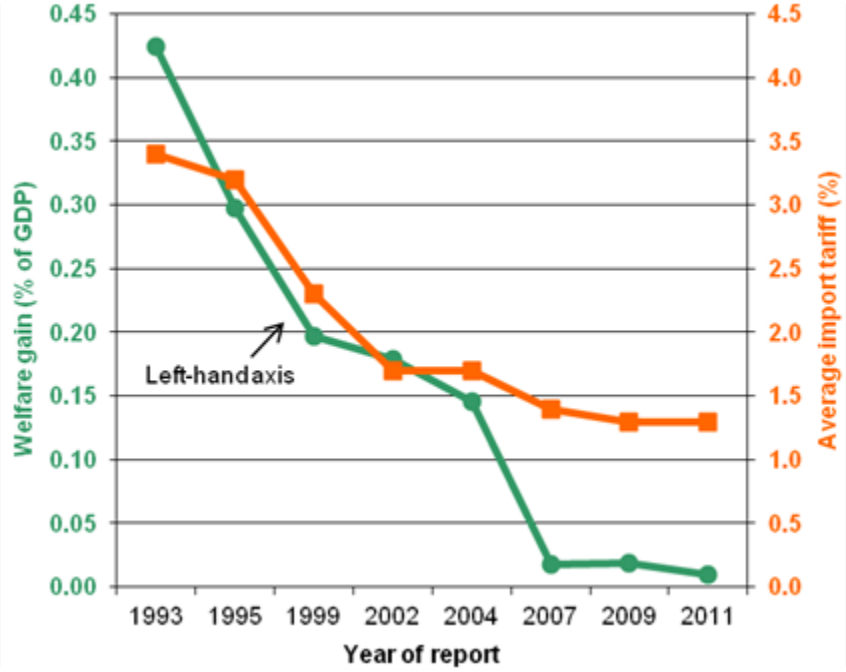
[a]Other restraints include origin quotas for ethanol and preferential rules of origin for textiles and apparel.

TABLE ES.2 Welfare gains from liberalization of significant import restraints in 2015, relative to the model's baseline projection (millions of dollars)

Sector	Change in economic welfare
Simultaneous liberalization of all significant restraints	2,602
Liberalization of individual sectors	
Food and agriculture	
Ethanol	1,513
Dairy	223
Tobacco	63
Sugar	49
Canned tuna	16
Textiles and apparel	514
Other manufacturing sectors	
Footwear and leather products	215
Costume jewelry	12
Writing instruments	8
Ball and roller bearings	5
Tires	5
Hand tools	3
Ceramic tile	3
China tableware	2
Glass and glass products	–1
Pesticides and agricultural chemicals	–3

Source: Commission estimates.

FIGURE ES.1 Tariff rates and estimated welfare gains have fallen over the life of the report, 1993–2011



Source: DataWeb/USDOC and Commission estimates.

Note: The average tariff is the import-weighted tariff across all tariff codes. The year of the report does not represent the year modeled. The current update (2011), for example, projects the U.S. economy to 2015. The pattern of welfare gain is suggestive only, as the model specification and product scope have changed over time, which can affect the comparison of welfare gains across these reports.

have been liberalized (figure ES.1). One significant change since the 2009 *Import Restraints* report is the increasing cost that barriers to ethanol imports would impose on domestic welfare, given the projected rising demand for such imports owing to the U.S. Renewable Fuel Standard, which requires increased ethanol use after 2011. The second main change is that textile and apparel restraints have become less restrictive following the 2008 elimination of the last U.S. quantitative restraints on imports in that sector.

Commission estimates indicate that while liberalization reduces output and employment in directly affected sectors, it benefits sectors that use liberalized products and benefits the economy as a whole. Liberalization lowers the prices of imported goods, thereby driving down domestic prices for similar goods as well; producers in affected sectors respond by reducing output. Because liberalization increases overall U.S. productivity, output gains in other sectors generally outweigh the losses in the directly affected sectors, and U.S. gross domestic product (GDP) rises (table ES.3). Similarly, employment in liberalized sectors typically falls, but this is completely offset in the model by employment gains in other sectors. Exports rise throughout the economy because of lower prices for domestic goods in liberalized sectors and higher productivity elsewhere. Imports also rise overall, driven by lower import prices and greater purchasing power (from the increased GDP).

The broad sectors of the economy shown in table ES.3 reflect these effects from liberalization. Output contracts in the broad sectors with the most significant restraints: agriculture and nondurable manufacturing (which includes textiles, apparel, footwear, and leather goods). Other goods-producing sectors (mining, construction, and durable

TABLE ES.3 Elimination of all significant import restraints: Effect on the entire U.S. economy and broad sectors, 2015 (percent change)

Sector	Employment	Output	Imports	Exports
Entire U.S. economy	0.0	(+)	0.4	0.3
Broad sectors				
Agriculture, forestry, and fisheries	(+)	–0.1	–0.3	1.5
Mining	(+)	(+)	(+)	0.5
Construction	(–)	(+)	([a])	2.0
Nondurable manufacturing	–0.4	–0.4	1.5	–1.5
Durable manufacturing	0.1	0.2	0.1	0.7
Transportation, communication, and utilities	0.1	0.2	0.6	1.0
Wholesale and retail trade	0.1	0.2	([a])	0.5
Finance, insurance, and real estate	(–)	(–)	(–)	0.7
Government and other services	(–)	(–)	(+)	0.7

Source: Commission estimates.

Note: (+) and (–) denote small positive and negative changes of less than 0.05 percent.

[a]Treated as nonimportable for purposes of the model.

manufacturing) expand, as do services such as transportation and retail trade that are closely linked to the movement of goods. Other services contract, although slightly, as resources in these industries move to other sectors in the economy that become more efficient after liberalization.

Effects of Sector-by-Sector Liberalization

The Commission study looked at sectors that have significant import restraints in order to identify the economic effects of import liberalization on consumers, companies, and workers in each sector, and to estimate the effects on upstream and downstream sectors. Key results for the sectors in table ES.2 (the five agricultural sectors, textiles and apparel, and the 10 other high-tariff manufacturing sectors), as well as services, are summarized below.

Ethanol (ethyl alcohol) Because of rapidly increasing quantities of ethanol mandated by the U.S. Renewable Fuel Standard, both U.S. ethanol production and U.S. imports of ethanol are projected to rise markedly by 2015. The projected higher import quantities and the continued moderate restrictiveness of ethanol restraints combine to make these restraints the most costly (in welfare terms) among all sectors considered. The Commission estimates that liberalizing ethanol import restraints would increase welfare by $1.5 billion and increase imports by 45 percent in 2015. Although liberalization would reduce the domestic industry's output and employment from their projected 2015 levels by 4–5 percent, these changes are minor considering that the ethanol industry employment and output are both projected to more than double between 2005 and 2015, with or without liberalization.

Textiles and apparel The Commission estimates that liberalizing import restraints in textiles and apparel would increase welfare by $514 million. This value is much lower than the estimate in the previous update, because imports are no longer subject to quantitative restraints. Liberalization would reduce output and employment in this sector by 9–10 percent, which would magnify the already substantial declines projected to occur without liberalization. Import liberalization would also eliminate exports of U.S. goods that are stimulated by preferential rules of origin. This change would lead to large declines in exports of U.S. products such as thread, yarn, fabric, and cut pieces of fabric to be sewn into clothing.

Dairy Dairy remains one of the sectors with the most restrictive restraints. The restrictiveness of dairy TRQs, however, has declined since the previous update. As a result, while liberalization of import restraints in dairy is estimated to increase U.S. welfare by about $223 million, this gain is considerably lower than the one estimated in the previous report. Dairy shipments and employment are expected to slip by about 1 percent each after liberalization, while imports of dairy products would increase by 63 percent. Butter, cheese, and condensed dairy products would experience the largest changes.

Tobacco Liberalization of import restraints on tobacco and tobacco products is estimated to increase welfare by about $63 million, which is somewhat lower than in the previous report due to less restrictive tobacco TRQs. Imports of tobacco are expected to rise markedly from liberalization (by 73 percent), while imports of cigarettes are also expected to increase, but by a much smaller percentage (7 percent). Output and employment in tobacco would decline by 3 percent. Producers of cigarettes would benefit from cheaper imported tobacco, but would be hurt by increased cigarette imports; on net, output of cigarettes would rise by less than 1 percent.

Sugar Removing tariffs and TRQs on imports of raw and refined sugar is estimated to increase welfare by about $49 million. This is a significantly lower welfare gain than in the previous update, reflecting the smaller gap between U.S. and world sugar prices used in this projection. Total sugar imports would increase by 32 percent after liberalization. Output of raw cane sugar would decline by 8 percent. Cane refiners would benefit from increased imports of raw cane sugar, their main intermediate input, at lower prices, and would increase shipments by 3 percent; beet sugar refiners would not similarly benefit, because their intermediate input is not generally traded internationally. Confectioners, benefiting from the decline in refined sugar prices, would increase production and exports.

Canned tuna Ending import restraints in canned tuna would increase welfare by $16 million, which is similar to the gain estimated in the previous update. Imports of canned tuna would increase by 20 percent, and output would decline by 8 percent. Employment in the broader canned fish industry would fall by 7 percent.

Other high-tariff sectors Ten other sectors were identified as subject to relatively high tariffs. The welfare effects of eliminating these tariffs are estimated to range from a gain of $215 million for footwear and leather products to a loss of $3 million for pesticides and agricultural chemicals. These gains are comparable in size to those estimated in the previous update. Most sectors

are expected to see increased imports and exports, lower output and employment, and lower consumer prices.

Services The United States is very open to the imports of services from other countries. Nonetheless, some U.S. measures restrict services imports in certain industries, such as transportation (restrictions on foreign ownership and on transporting freight within U.S. borders), communication (foreign ownership restrictions), and some professional services (state-level accreditation standards). The report describes import restraints in services qualitatively, but it does not attempt to offer a quantitative analysis of the effect of their removal due to the obstacles to quantifying the restrictions.

U.S. and Global Supply Chains

Many goods and services are no longer designed, produced, and sold within a single country. Instead, the activities needed to bring a product from conception to consumption are increasingly spread across multiple countries. The international production networks that link companies carrying out these activities, and that allow firms to move goods and services efficiently across national borders, are referred to as global supply chains. Over time, several factors have spurred the development of these chains. Chief among these are falling trade costs (due to trade liberalization, lower transportation costs, and better logistics), technological change (such as improved telecommunications), and institutional development in areas such as property rights. As countries have become more integrated into these chains, they have become more specialized in specific tasks based on comparative advantage. The United States is no exception, and supply chains have generated changes in U.S. production and trade that have had major effects on many U.S. consumers, workers, and companies.

By most measures, U.S. companies have become increasingly involved ("integrated") in global supply chains. The value of U.S. manufacturers' purchases of imported inputs as a fraction of their total input costs roughly quadrupled between 1980 and 2006. According to available data and Commission calculations, imported inputs account for over one-fifth of all intermediate inputs used in the most integrated U.S. industries, such as apparel, motor vehicles, and computers and electronic products. Since many of these goods are subsequently exported, the share of imported inputs that were embodied in U.S. merchandise exports more than doubled between 1977 and 2002.

Services such as transport, warehousing, and logistics are integral to the smooth operation of global supply chains. U.S. firms are among the leading providers of such services worldwide. Other services have become increasingly traded across borders in global supply chains. Despite this growth, the value of intermediate services (such as communications, business services, and computer services) imported by U.S. companies remains much lower than the value of imported intermediate goods (such as parts and components). Global services trade may be poised for future increases as companies seek to reduce costs by splitting apart such functions as human resources management, customer support, accounting and finance, and procurement, and moving some tasks where they can be provided more efficiently or at lower cost. As the United States is the world's largest provider of services, it could gain substantially from growing international trade in business, financial, and technical services in global supply chains.

TABLE ES.4 Country sources of value added in U.S. imports, exports, and absorption, 2004, percent

Activity	U.S.	China	Japan	East Asia	Canada	Mexico	Latin America	Europe	Others	Total
Imports	8.3	7.7	10.4	12.0	11.0	4.9	6.3	26.1	13.2	100.0
Absorption[a]	89.0	0.9	1.3	1.5	1.3	0.6	0.7	3.2	1.4	100.0
Exports	87.1	0.8	1.3	1.5	1.7	0.9	1.1	3.3	2.1	100.0

Source: Commission calculations.

[a]U.S. absorption refers to total U.S. use (by manufacturers, consumers, etc.) of intermediate and final goods and services from all sources.

As a good crosses multiple borders in a global supply chain, many countries contribute value to the final product. Tracing the sources and destination of such value in U.S. trade flows makes it possible to present a comprehensive view of U.S. participation in global supply chains and to quantify other countries' contributions to the goods and services that the United States imports, consumes, and exports. This study found that the United States exchanges the most value in global chains with Canada, Mexico, the EU, Japan, and China, and in industries such as electronics, chemicals, motor vehicles, and apparel. According to Commission calculations, a significant share of the value of U.S. imports (8.3 percent) consists of value contributed by U.S. workers and firms that has returned home after finishing or assembly abroad (table ES.4). In international comparisons, the United States has the highest percentage of returning value added among all countries,[3] reflecting the large U.S. market and its tight integration into global supply chains, particularly in the motor vehicle sector. U.S. workers and companies contribute 89 percent of the value of all goods and services used ("absorbed") in the economy, and they contribute a similar share to U.S. exports.

Participation in global supply chains affects U.S. firms, workers, and consumers. Although this report does not estimate these effects, a review of the literature suggests that global supply chains present both opportunities and challenges. Companies can raise their productivity when they specialize in narrower tasks that take advantage of their core competencies. Consumers also tend to benefit from lower prices, increased variety, and faster access to goods. The effect on workers, however, is more ambiguous. The United States increasingly specializes in mid- to high-skilled tasks, a trend that benefits high-skilled workers but puts downward pressure on the wages of low-skilled workers. Evidence shows that workers whose jobs are offshored experience wage declines, particularly when they must change industries or occupations, while other workers benefit from the effects of higher productivity. There is no consensus yet on how strongly particular types of workers have been affected, either positively or negatively, but several studies identified in this report suggest that the overall effect on U.S. workers of increased U.S. involvement in global supply chains has been small but positive. Employment opportunities for U.S. workers arising from global supply chains include home-office activities of multinational firms, such as R&D, product design, logistics, marketing and sales; exports of skill-intensive services, including financial services, business services, and travel services; and exports of advanced-technology goods, such as electronic components and chemistry-based consumer goods.

[3] The world average share of returning value added in imports is 4.0 percent. Chapter 3 provides additional information on the sources of value added in other countries' imports.

CHAPTER 1
Introduction

This is the seventh update in the series of reports entitled *The Economic Effects of Significant U.S. Import Restraints*. Since 1989, when the U.S. International Trade Commission (Commission or USITC) began investigating this topic,[1] U.S. import restraints have imposed increasingly smaller costs on the U.S. economy in terms of net economic welfare, output, employment, and trade. Estimates in this seventh update remain consistent with these trends. The current estimate of the total cost to U.S. consumers of all significant U.S. import restraints is $2.6 billion, down from $4.6 billion in the previous update in 2009.[2] The estimated effects on specific U.S. sectors of removing the remaining restraints—a process known as "liberalization"—are also generally lower than in the sixth update, although ethanol is an important exception.

The decline in trade barriers in recent decades, both in the United States and abroad, has been a key contributor to the restructuring of global production and the rise in global supply chains. Led by the U.S. automobile industry's integration with Canadian companies in the 1960s, and followed by the apparel industry and later electronics companies, an increasing number of industries and corporate activities employ global supply chains as important sources of goods and services. The special topic on global supply chains in this report examines the development of these international networks, analyzes current U.S. participation in them, and discusses the effects, both positive and negative, that this participation has had on U.S. companies, workers, and consumers.

Scope and Organization of the Report

Chapter 2 provides updated estimates of the economic effects of liberalizing significant U.S. import restraints on U.S. companies, workers, and consumers. It also assesses the increase in net economic welfare from this liberalization. As requested in the original letter, this report considers all U.S. import restraints, except those originating from antidumping or countervailing duty investigations, section 337 or 406 investigations, or section 301 actions. The focus of the quantitative analysis in this report is on measures that are applied at the border, such as tariffs and tariff-rate quotas (TRQs) applied to imports of goods. Restraints on imports of services are discussed qualitatively.[3]

Chapter 2 focuses on sectors with the most restrictive restraints. As discussed in the next section, "restrictive import restraints" are defined as those that increase the price of imports or limit their quantity, including tariffs, quantitative restraints, and preferential

[1] The United States Trade Representative (USTR) originally requested this series of reports in May 1992. Before this series of investigations, the Commission conducted a similar study in three phases for the U.S. Senate Committee on Finance during 1989–91. In August 2010, the USTR, in addition to requesting a seventh update of this report, requested a review of global supply chains and U.S. participation in them. See app. A for facsimiles of both the 1992 and 2010 request letters.

[2] USITC, *Import Restraints: Sixth Update*, 2009, xii.

[3] Restrictions to trade in services tend to be nontariff measures, which are often applied "behind the border" and so are more difficult to quantify. Researchers have begun to model services restraints and nontariff measures in computable general equilibrium models, which is the class of model employed in this report. Some studies show large gains from liberalization of these restraints, but the results are highly variable and there is no consensus on the best way to measure such restraints. See USITC, *Import Restraints: Sixth Update*, 2009, 101–7.

rules of origin.[4] Historically, the most restrictive barriers have occurred in a small number of sectors: textiles and apparel, footwear, and a few agricultural products. In fact, three of the top four sectors listed in this seventh update as offering the greatest potential gains from liberalization also occupied the top spots in the first update in 1995 (table 1.1).[5] Two notable changes are the rapid rise in the ranking of ethanol in this list and the substantial decline in the ranking of textiles and apparel. In each case, recent modifications to U.S. policies have driven these changes, as discussed in chapter 2.

Unlike U.S. import restraints, which have remained relatively consistent for a long period, U.S. participation in global supply chains, the focus of the special topic in this report, has evolved rapidly. Chapter 3 presents a discussion of current U.S. participation in the context of the rapid development of global chains. This chapter contains four main sections. The first section describes the nature of global supply chains and the economic forces that have contributed to their growth. The second section summarizes and analyzes U.S. participation in global chains. The third section examines the effects of global supply chain participation on U.S. companies, workers, and consumers. The last section includes case studies of four industries (apparel, motor vehicles, televisions, and logistics) that demonstrate the divergent ways U.S. firms engage in, and often lead, global supply chains.

Approach

This report uses substantially different analytical approaches to examine its two main topics. The analysis of significant import restraints in chapter 2 is largely based on an economic model that examines the effect of liberalizing significant import restraints in a medium-term economic projection to 2015. The examination of global supply chains in chapter 3, by contrast, draws largely from existing literature and case studies. Chapter 3 also presents measures of U.S. engagement in global supply chains based on a new Commission database that tracks the sources of value embedded in products that are traded globally in these chains. The differences in approach were determined by the different objectives specified for the two topics in the original request letter and the letter for the current update, which asked for a detailed model-based examination of import restraints paired with an accessible overview of U.S. involvement in supply chains. Both chapters benefited from testimony presented during the Commission's public hearing on December 16, 2010, and written submissions from interested parties.[6]

Significant Import Restraints

To model the effects of trade policy liberalization in chapter 2, this study relies on the U.S. Applied General Equilibrium (USAGE) model.[7] As indicated by its name, USAGE

[4] Preferential rules of origin determine the eligibility of products to receive preferential access (reduced rates of duty) under free and preferential trade agreements. Among all products, preferential rules of origin for apparel are the most restrictive, and impose the highest costs, because they have the most stringent eligibility requirements, such as a requirement that a minimum share of value be added in the country of origin or that a "substantial transformation" of the product occur in that country.

[5] The model framework has changed over time, which may affect the rankings of specific products. The model framework is largely unchanged between the fifth and seventh updates, however, so the rapid increase in the prominence of ethanol is likely not due to model differences.

[6] See app. C and D.

[7] For an overview of the USAGE framework, see app. E and USITC, *Import Restraints: Sixth Update*, 2009, app. E. For a complete specification of the USAGE model see Dixon and Rimmer, "USAGE-ITC," June 2002.

TABLE 1.1 Sectors offering the greatest potential gains from liberalization in this seventh update and their ranking in some previous updates

Sector	Rank			
	First update, 1995	Third update, 2002	Fifth update, 2007	Seventh update, 2011
Ethanol	([a])	([a])	5	1
Dairy	2	3	3	2
Footwear and leather products	5	4	4	3
Textiles and apparel	1	1	1	4

Source: Commission estimate.

[a]Not included as a high-tariff sector.

is a single-country model of the U.S. economy. It incorporates general equilibrium relationships, which ensure that supply and demand conditions are met at all times in baseline projections and simulations based on the model, including the projection and simulation described in the next paragraph.[8] The model includes 539 industrial sectors, and it incorporates the linkages among these sectors, consumers, the government, and foreign economies. These linkages enable the Commission to specify the effect that trade policy changes have on different, but interrelated, parts of the U.S. economy. For example, the model specifies how changes to tariff rates on imports of ethanol affect employment not only in the ethanol sector, but also in the corn sector (from which most U.S. ethanol is produced), or other agricultural sectors.

The analysis of U.S. import restraints proceeds in three steps. These steps include (1) identifying sectors with significant restraints; (2) projecting the U.S. economy to 2015, to provide a baseline against which to measure the effects of liberalization; and (3) simulating the extent to which liberalizing the significant restraints will restrain or foster the trends present in the projected U.S. economy.

The USAGE model generates a dynamic projection of the U.S. economy in which industries can accumulate physical capital over time; the speed at which capital adjusts in each sector depends on economic conditions in the projection. Similarly, households can accumulate financial assets (or, as in the current macroeconomic environment, reduce financial liabilities owed to foreigners). Prices (which include interest rates and wage rates) and capital stocks do not adjust instantaneously in the model; as in the real world, prices and quantities take time to adjust. Because the current projection extends only to 2015, the adjustment process will not be complete in the projection. To estimate the results of liberalizing significant restraints, the model applies a static shock corresponding to the portion of significant barriers that remain in 2015.[9] Consistent with previous updates, the model assumes that wage rates adjust more flexibly over time. In these simulations, the real wage rates adjust so that aggregate employment remains unchanged as a result of the liberalization.[10]

Tariff rates are the first, and simplest, criterion used to identify sectors having significant restraints. The analysis uses a standard statistical measure to determine large differences from the average level. For the purpose of the analysis in chapter 2, tariff rates are

[8] General equilibrium analysis seeks to account for the ways in which the prices and production of all goods are interrelated in a system of multiple intersecting markets in accordance with the laws of supply and demand.

[9] For example, the tariff on tires is projected to fall to 2.3 percent ad valorem in 2015, so the model simulates the removal of a 2.3 percent barrier in 2015.

[10] This assumption insulates model results from the business cycle, allowing a better comparison of the effects of U.S. barriers over time, as in figure ES.1. On the other hand, the assumption may underestimate the economic changes and welfare gains from liberalization in economic downturns.

considered significantly restrictive if they exceed the average tariff by one standard deviation, which for 2010 included sectors with tariff rates greater than 3.9 percent.[11] Agricultural sectors have some of the highest tariff rates, while textiles and apparel account for the largest number of sectors with significant import restraints (see chapter 2 for a breakout of these sectors). Textiles and apparel sectors also have restrictive rules of origin, which magnify the effects of liberalizing these sectors.

In addition to tariff rates, selection is also based on the restrictiveness of TRQs for those sectors that are subject to them. A TRQ is a method of trade protection under the World Trade Organization (WTO) Agreement on Agriculture that imposes a low "in-quota" tariff rate on imports of specific goods from specific countries until an annual allocation is met. Any imports beyond the TRQ allocation are subject to higher over-quota tariff rates. In the model, restrictiveness is measured by the amount that TRQs raise the price of imported goods, which is largely determined by the over-quota tariff rate, the gap between U.S. and world prices, and the "fill rates" or the extent to which imports from specific sources approach or exceed their quantity allotments. As with tariffs, not all sectors subject to TRQs were deemed to have significant restraints.

The origin quota, applicable only to imports of ethanol, can have an effect similar to that of a TRQ in that it can raise the U.S. price above the price prevailing in the country of origin. The origin quota allows certain countries duty-free access to the U.S. market for a specified amount of ethanol produced from imported feedstocks. Such feedstocks can originate in third countries, such as Brazil. (See chapter 2 for details.)

As noted above, the simulation analysis begins by generating a projection of the U.S. economy to 2015 to provide a baseline against which the effect of liberalizing significant import restraints can be compared. The projection has two main components. First, official U.S. government forecasts are used to project the macroeconomy to 2015, based on the most up-to-date forecasts available in 2010 and 2011. This projection ties down key U.S. macroeconomic variables such as consumption, investment, government spending, and imports and exports, and also projects growth in world gross domestic product (GDP).[12] Using these macroeconomic projections, the model also generates baseline projections of output, employment, trade, and prices in each of the 539 sectors of the model that are consistent with the market structure of each industry.

Second, the baseline projections are further refined for the individual sectors that appear in this report. When available, as with dairy, textiles, and apparel, projections are shaped by current forecasts from other government agencies or industry sources. Projections in other sectors, such as tuna and cigarettes, are based mainly on trends observed in output, imports, exports, and prices in the 2005–10 period. Trends are modified when changes in 2005–10 are not representative of expected changes in the near future. For example, ethanol output and imports are projected to rise more rapidly between 2010 and 2015 than in the preceding five years because the U.S. Renewable Fuel Standard requires increased ethanol use after 2011. Appendix E presents more detail on the sources and values of these projections.

[11] In detail, the average tariff rate among the 539 sectors considered in this study was 1.26 percent ad valorem based on the cost, insurance, and freight (c.i.f.) import value, and the standard deviation was 2.62 percent.

[12] App. E describes the sources and values of key macroeconomic variables in the projection.

The baseline assumes that current U.S. import restraints will remain in place. At the same time, however, it incorporates known trade policy adjustments, such as changes to tariff rates and TRQ quantity allocations contained in U.S. free trade agreement (FTA) tariff staging schedules and in other trade agreements and provisions under preferential trade arrangements (PTAs). These agreements provide the projected values of trade policy variables (such as tariff rates and TRQ fill rates) through 2015.[13] For each product, the projected restrictiveness of the TRQs depends on the projected gap between U.S. and world prices as well as projected fill rates, which are specific to each exporting country. For many products, both price gaps and fill rates have declined in recent years, a trend that has made the TRQs less restrictive than in previous updates of this report and has reduced their effect on U.S. prices and net economic welfare. Table 1.2 summarizes the restrictiveness of import restraints in each sector in the model projection for 2015.[14] Dairy and sugar sectors have the most restrictive restraints. Box 1.1 discusses recent market changes in products subject to TRQs.

After the baseline projection is developed, the simulation can estimate the effects of liberalizing significant restraints, including tariffs, TRQs, the ethanol origin quota, and restrictive rules of origin. The liberalization of these restraints is modeled by setting the relevant tariffs to zero, removing TRQ quantitative restrictions, and removing preferential rules of origin in the textile and apparel sectors.[15] The model simulation solves for the new equilibrium with these changes in place. The simulation calculates new equilibrium values, consistent with supply and demand constraints, for all 539 sectors, although this report lists estimates for only the sectors of interest, along with key "upstream" and "downstream" sectors.[16]

Estimates of the effects of liberalizing each sector are presented relative to the changes expected to take place between 2005 and 2015 in the baseline projection. For example, U.S. output of butter is projected to grow 22 percent between 2005 and 2015 in the absence of policy liberalization. Liberalization of dairy restraints would lower U.S. butter output by 2 percent, for an overall increase of 20 percent between 2005 and 2015. As the focus of this section is the economic effect of liberalization on consumers, firms, and workers, the key variables of interest are net economic welfare (i.e., total purchasing power of U.S. consumers), output, and employment, in addition to imports and exports.

[13] For imports from countries without such agreements, future tariffs and TRQ allotments are based on their 2010 values.

[14] U.S. FTAs require tariffs for many products to be reduced by stages in accordance with "staging schedules." This means that a number of tariffs decline in mid-projection. As a result, by 2015 some tariff rates are below the 3.9 percent cutoff used to determine the most restrictive sectors in 2010. In addition, two other sectors (motorcycles, bicycles, and parts; and watches, clocks, and parts) were identified as having significant restraints based on their 2010 tariff rates, but have been excluded from the simulations. See chap. 2 for details.

[15] Liberalizations of tariffs, TRQs, and the origin quota directly affect imports into the United States. The removal of preferential rules of origin, in contrast, primarily affects U.S. exports by lowering foreign demand for U.S. inputs exported to U.S. FTA partners and preferential trading partners. See chap. 2 for details.

[16] An "upstream" sector provides output that is used as an input by a "downstream" sector.

TABLE 1.2 Restrictiveness of U.S. import restraints in 2015 projection (percent increase in price from restraints)

Sector	U.S. tariff[a]	U.S. TRQ[b]	Total[c]
Food and agriculture			
Ethanol	5.2[d]	0.0	5.2[d]
Dairy	6.2	6.5	13.0
Butter	6.8	6.8	14.1
Cheese	8.1	5.2	13.7
Condensed and evaporated dairy[e]	4.6	11.5	16.6
Dry dairy products	3.7	5.3	9.2
Ice cream	1.5	5.8	7.4
Fluid milk	3.7	2.6	6.3
Tobacco	3.7	4.6	8.5
Sugar	1.3	12.2	13.7
Canned tuna	10.5	0.0	10.5
Textiles and apparel			
Yarn, thread, and fabric	3.6	0.0	3.6
Other textiles products	5.8	0.0	5.8
Apparel	9.6	0.0	9.6
Other manufacturing sectors			
Ball and roller bearings	5.5	0.0	5.5
Ceramic tile	5.9	0.0	5.9
Costume jewelry	5.8	0.0	5.8
Footwear and leather products	9.8	0.0	9.8
Glass and glass products	3.8	0.0	3.8
Hand tools	4.1	0.0	4.1
Writing instruments	4.7	0.0	4.7
Pesticides and agricultural chemicals	2.7	0.0	2.7
China tableware	6.3	0.0	6.3
Tires	2.3	0.0	2.3

Source: Commission estimates based on tariff rates and TRQ commitments in the USAGE model projection for 2015.

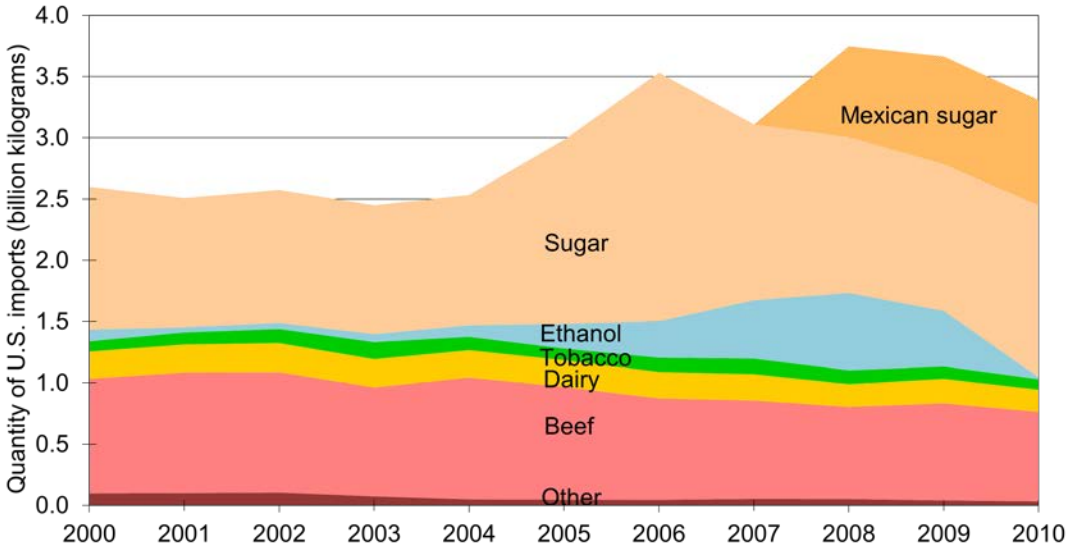
Note: The table provides projected 2015 tariff and TRQ values, which may differ from their 2010 values. For example, projected tariffs may be below their 2010 values because of tariff staging in U.S. trade agreements.

[a]Measured as an ad valorem equivalent share of the c.i.f. value of imports.
[b]Measured as an export tax equivalent, the degree to which a TRQ increases the export price of a commodity (i.e., the price before entry into the United States).
[c]The total effect includes the interaction of tariffs and TRQs, and in most cases exceeds the sum of these effects.
[d]Including the additional "other duty or charge." See chap. 2 for details.
[e]Excluding concentrated milk protein products.

BOX 1.1 Decline of U.S. imports entering under TRQs

Imports subject to TRQs have declined substantially in volume in recent years. Among all such goods, sugar is the only major commodity for which imports are substantially above their volume in 2004 (see figure below).[a] Imports of most other commodities have trended downward.[b] Lower quantities indicate that over the past decade TRQs have become a smaller barrier to imports of most of the products to which they are applied, as is reflected in estimates throughout this update.

Quantity of in-quota imports subject to U.S. TRQs, 2000–2010



Source: USITC DataWeb/USDOC.

Note: Ethanol imports based on Commission estimates of imports entering under the Caribbean Basin Initiative dehydration program. Liters converted to kilograms based on the density of ethanol.

Only imports of sugar and ethanol exhibited any notable increases in volume between 2004 and 2010. USDA relaxed sugar TRQs in 2006 after Hurricane Katrina damaged U.S. refineries.[c] After the 2006 spike, increases in sugar imports have come largely from Mexico, which as a result of the North American Free Trade Agreement (NAFTA) is no longer subject to these TRQs. The changes in ethanol imports were more transitory. Implementation of the Renewable Fuel Standard resulted in the 2006 import increase.[d] Initially, domestic ethanol supply was limited, but imports declined sharply after 2008 as the domestic industry expanded.

Declining imports in other sectors largely reflect changes in global market conditions and do not reflect major changes in intent or action on the part of the U.S. government. In the beef and dairy sectors, while import values have held fairly steady since 2004, import quantities have fallen substantially. Global market forces have simultaneously reduced supply to the United States while driving up world prices;

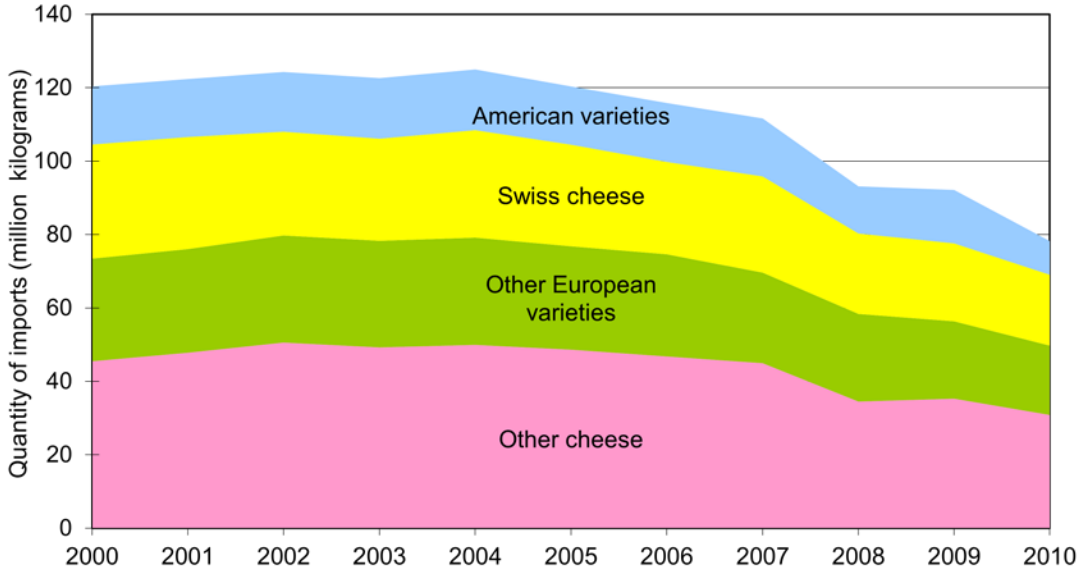
[a]Ethanol imports are included in the figure and discussion because they are subject to quantitative restraints under an origin quota, although this is not a TRQ.
[b]Import values of some commodities increased from 2004 to 2010 because agriculture prices have risen markedly (48 percent overall). USDOL, BLS, Import/Export Price Indexes (accessed April 1, 2011).
[c]USDA, ERS, *Sugar and Sweeteners Market Outlook*, 2006, 42–43.
[d]For additional ethanol market information, see chap. 2 of this update and USITC, *Import Restraints, Sixth Update*, 2009, 24–25.

BOX 1.1 Decline of U.S. imports entering under TRQs—*Continued*

factors include drought in Australia and New Zealand and increased demand in emerging markets such as Russia and Asia.[e] As a result, beef TRQs have become much less restrictive, and so have not been included as a sector with significant restraints in this (or the previous) update of this report. Only Uruguay continues to fill its quota, but it accounts for a small share of U.S. beef imports.

Cheese is a good example of a dairy sector with declining import quantities. The quantity of imported cheese has gone down every year since peaking in 2004 (see figure below). The reductions have been quite broad, affecting multiple types of cheese and multiple import sources. Imports from Australia have fallen dramatically (e.g., from 91 percent of the quota allocation for swiss cheese in 2005 to 4 percent in 2010). Among all sources, only Norway filled its quota allocation in 2010. As world prices have risen, consumers have purchased more U.S. cheese, generating increased domestic production and exports.[f]

Quantity of imported cheese subject to U.S. TRQs, 2000–2010



Source: USITC DataWeb/USDOC.

Note: American varieties include cheddar, colby, and american cheese. European varieties include gouda, edam, blue-mold, gruyère, swiss, and emmentaler.

[e]USDA, FAS, *Dairy: World Market and Trade*, 2010, 2–3.
[f]For more market information, see the dairy discussion in chap. 2.

U.S. and Global Supply Chains

Chapter 3 provides an overview and analysis of global supply chains. Much of the discussion—the overview, a number of case studies, and a review of the ways that firms' participation in supply chains affects the U.S. economy—draws on a wide variety of literature on the subject, including economic journals, business and management studies, trade publications, government reports, and studies from institutions for the promotion and understanding of global value chains.

In addition, the chapter presents new indicators of U.S. integration in global supply chains based on the amount of value contributed by workers and firms in each country to the production of goods and services. A breakdown of a country's contribution to a specific good or service—whether to its design, production, assembly, or delivery—can provide a succinct snapshot of that country's role and its integration with other countries in a particular sector, such as motor vehicles. For example, for U.S. imports of auto parts from Mexico, the database used in this report estimates the share of the import value that was added in Mexico and the value that was added in other countries that produce and export semifinished components to Mexico. The database also estimates the amount of foreign value that is incorporated into motor vehicles and parts consumed in the United States, as well as the foreign value incorporated into motor vehicles exported by U.S. companies.

Ultimately, these measures reveal how dependent U.S. consumers and companies are on value produced in major countries and regions abroad. The analysis of value provides important detail unavailable in official trade statistics. For example, the import value of an iPhone from China was $179 in 2009, but a recent study shows that as little as $6.50 of this value was added in Chinese assembly operations, with the rest of the value being added in upstream activities in Japan, Korea, and the United States, which supply parts and components for the phone.[17]

Such product-specific analysis of value is beyond the scope of the current report, which provides industry-level analysis based on U.S. and foreign input-output tables that are linked by global trade statistics. Input-output tables report the "value added" by each industry, which equals the portion of value that exceeds the cost of intermediate inputs, and includes workers' wages and company profits. Because a global supply chain consists of a network in which each company purchases inputs and then adds value to a good or service, value added exactly captures the contribution of workers and firms in a particular industry and country to the value of a good. The sum of the value added by workers and companies in every country in the chain equals the value of goods produced by the network.[18]

Tracking value added in products that travel across multiple borders requires knowledge of industrial linkages within countries and between them. In fact, this analysis requires three distinct types of information. First, it is necessary to track how intermediate goods and services produced in one industry are used, and subsequently exported, by other industries in the same country. As with value added, these domestic linkages are summarized in input-output tables. Second, it is necessary to distinguish intermediate inputs that flow across national borders, which are identified in this study by examining detailed trade data and assessing which products are intermediates and which are (chiefly) used as final goods. Third, it is necessary to track linkages from one industry to

[17] Xing and Detert, "How the iPhone Widens the United States Trade Deficit with the People's Republic of China," 2010.

[18] Koopman et al., "Give Credit Where Credit Is Due," 2010, 6.

another across international borders, such as the amount of Japanese steel imported by U.S. automakers. Because such data for the United States are not publicly available, this study employs the assumption, common in studies of global supply chains, that all industries in a given country use the same proportion of intermediate inputs from a specific source.[19] Although this assumption introduces some uncertainty into the calculations, it is at this time the only way to make these estimates for the United States without using confidential data collected from individual companies.[20]

The database employed in this study is based on a global set of linked input-output tables for the year 2004 available through the Global Trade and Analysis Project (GTAP) in Purdue University, along with the detailed trade data and assumptions described in the previous paragraph. More recent estimates are not available, because tracking global economic linkages requires inter-country input-output data.[21] This study, however, does examine more recent U.S. trends with similar, but less informative methods employing only U.S. input-output data.[22]

While the global database has limitations, it is based on the most accurate and comprehensive data available, and has been shown to provide estimates quite similar to those of related studies of global value-added flows.[23] Because the exact value of imported intermediate inputs used by each sector cannot be known with certainty, estimates in chapter 3 are most precise at the aggregate level for U.S. imports, consumption, and exports. Sectoral estimates illustrate the degree of integration of one U.S. industry in global supply chains compared with that of other U.S. industries, but the exact value of foreign content for specific industries cannot be determined without further information on industrial use of imported intermediate inputs. Box 3.4 discusses how improved data could improve our understanding of U.S. participation in global supply chains and its effects.

[19] This is equivalent to assuming that if 5 percent of U.S. imported steel comes from Japan, then Japan accounts for 5 percent of imported steel in both the auto sector and the construction sector (and all other U.S. sectors). Studies that maintain this same assumption include Daudin et al., "Who Produces for Whom in the World Economy?" 2009; Johnson and Noguera, "Accounting for Intermediates," 2010; and a number of studies based on the World Input-Output Database, such as Foster et al., "Patterns of Net Trade in Value Added," 2011.

[20] For discussion of the limitations of this approach and a call for U.S. statistical agencies to make the information more readily available, see Feenstra et al., "Report on the State of Available Data," 2010, 5–6.

[21] The Organization for Economic Co-operation and Development, the Institute of Developing Economies in Japan, and the World Input-Output Database have initiatives to incorporate more recent data, though none will be completed before 2012.

[22] The chief limitation of the U.S.-specific methods is their inability to distinguish U.S. value that returns from abroad embodied in imported goods and services. Such returned U.S. value can be substantial in sectors such as motor vehicles, electronics, and machinery. (See table 3.3.) In the U.S.-specific methods, all returned U.S. value is erroneously counted as foreign value.

[23] The database in this study is based on Koopman et al., "Give Credit Where Credit Is Due," 2010. Related studies with similar estimates for global value-added flows include Daudin et al., "Who Produces for Whom in the World Economy?" 2009, and Johnson and Noguera, "Accounting for Intermediates," 2010.

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CHAPTER 2
Effects of Removing Significant Import Restraints

This chapter examines the effects of removing significant U.S. import restraints on U.S. consumers, companies, and workers. Removing these barriers to trade is expected to increase domestic welfare, exports, and imports. At the same time, however, it is expected to reduce output and employment in sectors most directly affected by the liberalizations.

For each industry with a significant restraint, the chapter presents updates on market conditions, explains and evaluates the import restrictions, and assesses the effects of removing those restrictions. Estimates are produced by the dynamic USAGE model and are assessed relative to a baseline of projected industry growth to 2015.[1] As in previous updates, this chapter first presents the effects of simultaneously liberalizing all sectors with quantified import restraints, and then presents the effects of individual liberalization of specific sectors. Not every sector with a significant restraint receives an individual writeup; those are reserved for sectors with multiple restraints or more complex restraints. Sectors affected chiefly by high tariffs are discussed together at the end of the chapter.

Relative to the previous update, the largest changes in the present update were driven by trade policy changes affecting textiles and apparel and by U.S. regulatory changes in the ethanol sector. The elimination of quantitative restraints on imports of textiles and apparel from China and Vietnam in 2008 substantially reduced the cost (in net welfare terms) of textile and apparel restraints. By contrast, the estimated cost of restraints on ethanol imports increased, because demand for ethanol is projected to rise rapidly in the near future following mandates for increased use of renewable fuels. The long-term decline in imports subject to tariff-rate quotas (TRQs) also played a moderate role, particularly in dairy sectors.

Although the model estimates that the magnitudes of change will differ by sector, the changes in the markets for liberalized goods are broadly similar. Removing a measure such as a TRQ reduces the landed, duty-paid price of the affected U.S. import. The decline in the import price is related to the restrictiveness of the trade measure, with the elimination of more restrictive measures inducing larger declines. To compete with lower-priced imports, U.S. producers of similar commodities reduce their prices. Therefore, these producers supply less to the domestic market, and output and employment decline in these industries; some producers may go out of business. Remaining U.S. producers of the good become more competitive in the world economy and increase exports.

Users of the liberalized good benefit from the changes. As the prices of imported and domestic goods fall, consumption of the liberalized good increases. Consumers benefit because they can continue to buy the same quantity of the good at a lower price and have money remaining for other uses. Producers who use the product as an input become more competitive in both domestic and foreign markets. Overall, the gains typically outweigh the costs, although there are distributional effects. For example, workers employed in

[1] See chap. 1 and app. E for more details about the analytical framework and the baseline projection.

import-competing industries face the prospect of job loss and lower wages. Households broadly benefit from lower-cost consumption, but not every household gains. Those facing dislocation bear greater costs, barring any special assistance that they may receive. The same distributional effects hold for capital owners (owners or investors in firms) in different sectors of the economy.

Effects of Removing All Significant Import Restraints

Effects of Liberalization on the Aggregate Economy Relative to Projected Trends, 2005–15

Although the U.S. and global recessions between 2007 and 2009 resulted in temporary GDP declines, the model baseline projects that the U.S. GDP will expand by 20.8 percent between 2005 and 2015 (or 1.9 percent per year), with U.S. international trade growing substantially faster in that period (table 2.1).[2] Relative to this baseline, liberalizing all significant import restraints at once, including eliminating all preferential rules of origin (ROO) in textiles and apparel, is estimated to increase U.S. GDP by $2.2 billion, imports by $11.5 billion, and exports by $9.0 billion. Expressed in percentage terms, these economy-wide effects are small relative to the projected growth in the period. For example, U.S. imports would expand by 24.4 percent with liberalization instead of 24.0 percent without it. The net economic welfare gain (a measure of increased consumer purchasing power) for the entire economy from simultaneous liberalization of quantified restraints is estimated at $2.6 billion. As noted in chapter 1, wage rates adjust in the simulation so that the trade liberalization has no effect on aggregate employment.

Effects of Liberalization on Individual Sectors Relative to Projected Trends, 2005–15

When all significant U.S. import restraints are eliminated at once, almost all liberalized sectors show the expected patterns of declining domestic production, employment, and prices, along with increases in imports and exports (table 2.2).[3] Among all liberalized sectors, textiles and apparel shrinks the most, with an overall output decline of nearly 10 percent. The large declines in these sectors occur because the elimination of preferential ROO sharply reduces foreign demand for U.S.-produced apparel inputs, and so overall exports decline by more than 50 percent.

Appendix table E.4 provides additional detail for individual products. As in the aggregate sectors, liberalization would reduce output in nearly all affected products, although output of a few products expands because liberalization allows for cheaper imports of intermediate products. For example, cane sugar refiners benefit from the liberalization because they gain access to larger quantities of cheaper imported inputs (foreign raw cane sugar), while beet sugar refiners and the sugar farming sector suffer losses from liberalization.[4]

[2] These projected macroeconomic changes provide the baseline for all liberalizations in this chapter. See chap. 1 and app. E for additional details about the macroeconomy in the baseline projection.

[3] Price changes can be found in app. table E.4.

[4] Beet sugar refiners do not benefit because there is little international trade in sugar beets.

TABLE 2.1 U.S. national economy: Summary data and simulation results

Item	Summary data				Projected change, 2005–15 (%)	Effect of liberalization (%)
	2007	2008	2009	2010		
	Millions of employees[a]					
Employment	137.6	136.8	130.8	129.8	8.9	0.0[c]
	Billions of real $					
GDP	14,061.8	14,369.1	14,119.0	14,660.4	20.8	(+)
Imports[b]	2,375.7	2,553.8	1,964.7	2,353.9	24.0	0.4
Exports[b]	1,661.7	1,843.4	1,578.4	1,837.5	59.0	0.3

Sources: USDOC, BEA, *National Economic Accounts;* USDOL, BLS, CES Survey Database (accessed July 13, 2011); Commission estimates for projection and liberalization.

Note: (+) denotes a small positive change of less than 0.05 percent. Effects of liberalization represent deviations from the projected changes.

[a]Employees on nonfarm payrolls.
[b]Including goods and services.
[c]Total change in employment is fixed at zero.

TABLE 2.2 Simultaneous liberalization of all significant restraints*:* Effect on liberalized sectors in 2015 (percent)

Sector[a]	Employment	Output	Imports	Exports
Food and agriculture				
Ethanol	–4.4	–4.6	44.4	([b])
Dairy	–1.0	–1.2	62.7	5.2
Tobacco	–0.5	–0.5	21.8	4.2
Sugar	–1.8	–1.3	31.0	10.4
Canned tuna	–6.6	–8.2	20.1	13.0
All textiles and apparel	–8.9	–9.8	1.9	–51.9
Yarn, thread, and fabric	–9.2	–8.6	–1.7	–30.3
Other textile products	–4.4	–4.9	1.4	–46.4
Apparel	–15.9	–15.9	2.2	–89.1
Other manufacturing sectors				
Ball and roller bearings	–3.7	–3.7	10.6	0.7
Ceramic tile	–4.4	–4.4	2.4	0.6
Costume jewelry	–2.3	–2.3	4.9	1.1
Footwear and leather products	–1.7	–1.6	4.1	0.4
Glass and glass products	(+)	(+)	5.6	4.0
Hand tools	–0.2	–0.2	2.0	0.2
Writing instruments	–1.8	–1.7	4.0	1.5
Pesticides and agricultural chemicals	0.1	0.1	3.1	1.6
China tableware	–4.0	–4.0	4.1	0.5
Tires	–0.3	–0.3	1.6	0.4

Source: Commission estimates.

Note: (+) denotes a small positive change of less than 0.05 percent.. Effects of liberalization represent deviations from the projected changes. Results in this table may differ from those in later tables in this chapter that show the effects of sector-by-sector liberalization.

[a]See app. table E.6 for sector definitions.
[b]Not applicable because exports decline to zero in the baseline. See ethanol discussion below.

Ethanol

The great bulk of U.S. ethanol (ethyl alcohol) production is derived from corn.[5] Ethanol can be mixed with gasoline to lessen the emissions created by fuel combustion in gasoline engines, and it can also be used as a gasoline extender or substitute. U.S. production of ethanol in 2010 reached a record 13.1 billion gallons, valued at $22.0 billion (table 2.3). Production in 2010 was near U.S. capacity, which totaled approximately 13.5 billion gallons as of January 2011.[6] The United States is the leading global producer and consumer of fuel ethanol, accounting for 58 percent of world production and consumption in 2010.[7] The U.S. ethanol industry employed 9,727 workers in 2010. In recent years, U.S. imports of ethanol have dropped precipitously, while exports have expanded in equal measure, due to rising world prices and lower imports from Brazil, previously a major global exporter.[8]

Much of current U.S. use of ethanol is driven by legislation enacted in 2005 and 2007, and these acts will drive even greater use in the future. The Energy Policy Act of 2005 established the Renewable Fuel Program (RFP), which mandated that renewable fuels, including ethanol, be blended with gasoline.[9] The Energy Independence and Security Act of 2007 made several changes to the Energy Policy Act and established the Renewable Fuel Standard (RFS).[10] The RFS requires substantial use of ethanol, and the mandate increases rapidly over time. Mandated quantities more than tripled between 2006 and 2010, and will nearly triple again by 2022. The RFS also requires that specific quantities must be produced from particular feedstocks, such as cellulose or non-corn starch. The RFS can be filled by ethanol from domestic production as well as from imports. Therefore, these mandates may increase demand for imported ethanol produced from some feedstocks that are not produced in high volume in the United States.

The RFS requires that 36 billion gallons of renewable fuel be mixed into domestic gasoline supplies by 2022 (figure 2.1). Of this amount, 21 billion gallons must be of advanced biofuel—16 billion gallons of cellulosic biofuel, 1 billion gallons of biomass-based diesel, and 4 billion gallons of unspecified advanced biofuel that can be produced from non-corn-based feedstocks, such as sugarcane. Cellulosic ethanol is not produced in commercial quantities anywhere in the world. Sugarcane ethanol is not produced in significant quantities in the United States. Brazil is by far the world's leading producer of sugarcane ethanol and has been a significant supplier of U.S. ethanol imports, both directly and through certain Caribbean Basin Initiative (CBI) countries under a special quota for ethanol dehydrated in beneficiary countries. The feedstock for the remaining 15 billion gallons of renewable fuel is unspecified; this is the only category available to corn ethanol, which is produced in abundance in the United States. However, biofuel in more restrictive categories may fill the requirement in less restrictive categories. For example, sugarcane ethanol can fill the RFS category (unspecified renewable fuel) that applies to corn ethanol.

[5] There are two different processes used in the United States to produce ethanol from corn: dry corn milling and wet corn milling. The production of ethanol from cellulosic biomass is still under development and has yet to be commercialized.

[6] RFA, *Statistics* (accessed March 16, 2011).

[7] Calculated based on data from LMC International.

[8] Exports include non-beverage ethanol for uses other than fuel.

[9] Pub. L. No. 109-58.

[10] Pub. L. No. 110-140.

TABLE 2.3 Ethanol for fuel use: Summary data and simulation results

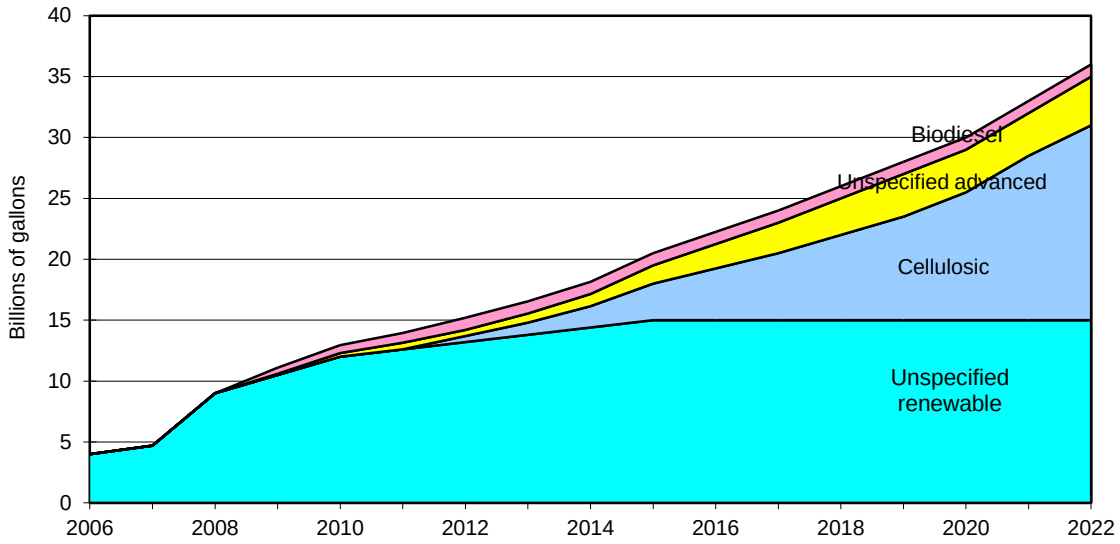
Item	Summary data 2007	2008	2009	2010	Projected change, 2005–15 (%)	Effect of liberalization (%)
Employment (employees)	7,029	9,182	9,603	9,727	202.2	–4.4
Production (millions of $)[a]	14,316	12,386	14,316	22,026	374.5	–4.7
Imports (millions of $)	855	1,249	358	33	888.4	44.8
Exports (millions of $)	7	374	245	883	–99.9	([b])

Sources: Employment compiled from the USDOL, BLS, *Quarterly Census of Employment and Wages* (accessed February 24, 2011)*;* imports and exports compiled from official statistics of the USDOC; Commission estimates for projection and liberalization.

Note: Model sectors are determined by U.S. input-output classifications and may differ from summary data. Projected changes are based on quantity trends. Effects of liberalization represent deviations from the projected changes. See app. E for details and table E.6 for sector definitions.

[a]Calculated based on quantity data from the USDOE, EIA, and price data from LMC International.
[b]Not applicable because exports decline to zero in the baseline.

FIGURE 2.1 The RFS: Mandated ethanol use rises rapidly



Source: Energy Policy Act; Energy Independence and Security Act.

Note: Data for 2006 and 2007 represent the mandate under the RFP.

Beginning in 2009, the RFS addresses four separate categories of biofuel, listing specific amounts of each that must be blended with U.S. gasoline. Some volume requirements have already been reallocated, due to continued delay in the commercialization of cellulosic ethanol, though overall RFS totals have not changed.[11] In 2010, the RFS was equivalent to 8.01 percent of projected U.S. gasoline and diesel consumption.

"Blenders"—firms that mix ethanol into gasoline—are eligible for a partial exemption from the U.S. federal excise tax of 18.4 cents per gallon assessed on motor fuels. To earn this tax exemption, referred to as the volumetric ethanol excise tax credit (VEETC), the

[11] The 2010 volume requirement for cellulosic biofuel was lowered from 100 million gallons to 6.5 million gallons, and the 2011 volume requirement was lowered from 250 million gallons to 6 million gallons. Because the RFS total remained the same, the changes effectively increased the requirement for the unspecified advanced biofuel category in these years. The Environmental Protection Agency (EPA), which administers the RFS, expects the shortfall to be filled mainly by biodiesel. EPA, *EPA Finalizes Regulations,* February 2010, 4; EPA, 75 Fed. Reg. 76792, December 9, 2010.

blenders must mix ethanol derived from renewable resources into a gallon of fuel.[12] The VEETC, which replaced previous tax credits, became effective January 1, 2005.[13] Set at 51 cents per gallon of ethanol in 2008, the VEETC was reduced to 45 cents per gallon as of January 1, 2009, and has been extended until the end of 2011.[14] Thus, gasoline blended with 10 percent ethanol has received a tax exemption equal to 4.5 cents per gallon since 2009. The VEETC applies to both domestically produced and imported ethanol.

Nature of Trade Restraints

The United States administers two trade policy tools for imports of ethanol for fuel use: duties and an "origin quota," explained below. There are two duties applicable to imports of fuel ethanol. General duty rates of about 2 percent apply to countries with normal trade relations (NTR) status.[15] Duty-free treatment applies to beneficiary countries under all U.S. free trade agreements (FTAs) and preferential trade agreements (PTAs), including beneficiaries under the Generalized System of Preferences (GSP), provided the country is a least-developed beneficiary country.

An additional "other duty or charge" (ODC) of 54 cents per gallon is assessed on fuel ethanol imports from most countries.[16] The ODC was established in 1980 to offset a tax credit (currently the VEETC), since the tax credit applies to imported as well as domestically produced fuel ethanol.[17] The ODC currently is greater than the VEETC and expires together with the VEETC at the end of 2011.

Under an origin quota certain countries receive duty-free access to the U.S. fuel ethanol market for a specified amount of ethanol dehydrated from non-beneficiary feedstocks.[18] Such feedstocks can originate in third countries, such as Brazil. In-quota imports from Caribbean Basin Economic Recovery Act (CBERA) beneficiaries, CAFTA-DR and U.S. island possessions enter free of duty.[19] The over-quota imports are not considered to be a product of those countries and are assessed the rate applicable to the feedstocks' country of origin. The quota has never been filled; the fill rate was 75 percent in 2008, 26 percent in 2009, and 0.7 percent in 2010.[20] The sharp drop in the fill rate resulted from a decline in the availability of feedstock from Brazil.

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[12] Ethanol derived from petroleum, natural gas, or coal is not eligible for the tax exemption.

[13] American Jobs Creation Act of 2004, Pub. L. No. 108-357, § 301.

[14] Food, Conservation, and Energy Act of 2008, Pub. L. No. 110-234, §15331 (a) (1) (C). The VEETC expires at the end of 2011. Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010, Pub. L. No. 111-312, §708, 124 Stat. 3312 (2010), available at http://www.gpo.gov/fdsys/pkg/PLAW-111publ312/pdf/PLAW-111publ312.pdf.

[15] U.S. imports of fuel ethanol enter under the Harmonized Tariff Schedule (HTS) subheadings 2207.10.60 and 2207.20.00. The general duty rate for HTS subheading 2207.10.60 is 2.5 percent ad valorem; for HTS subheading 2207.20.00, it is 1.9 percent ad valorem.

[16] Least-developed GSP beneficiaries, CBERA and CAFTA-DR beneficiaries, ATPA beneficiaries, Canada, Israel, Mexico, and Peru are not subject to this duty. This additional duty is found in chap. 99, subch. I of the HTS. The applicable tariff subheading for the extra duty is 9901.00.50.

[17] Omnibus Reconciliation Act of 1980, Pub. L. No. 96-499. The ODC initially was set at 10 cents per gallon.

[18] Steel Trade Liberalization Program Implementation Act of 1989, Pub. L. No. 101-221, § 7. Under the quota, CBERA beneficiaries as of the date of the implementation of the quota (1989) may import and dehydrate hydrous ethanol, mainly from Brazil, and export the finished product free of duty to the United States. The quota applies to duties under HTS chaps. 22 and 99. The quota is set at 7 percent of U.S. domestic use in the previous year. The quota quantity is 875.4 million gallons for calendar year 2011. The quota was 452.2 million gallons in 2008, 621.5 million gallons in 2009, and 739.8 million gallons in 2010. 75 Fed. Reg. 82069.

[19] CAFTA-DR reserves a part of the CBERA quota for El Salvador and Costa Rica.

[20] Data provided by the Customs and Border Protection Agency. For more information on the quota, see USITC, *Import Restraints, Fourth Update*, 2004.

Projected Industry Trends, 2005–15

The baseline simulation projects a substantial increase in output and imports of ethanol by 2015, driven by the RFS mandates discussed above. U.S. production of corn-based ethanol is projected to expand from about 4 billion gallons in 2005 to 15 billion gallons by 2015, while cellulosic ethanol production expands to 3 billion gallons.[21] As U.S. output is not expected to meet the quantity mandated by the RFS in 2015, imports of ethanol derived from sugarcane are also expected to expand significantly, totaling 1.5 billion gallons by 2015. While the United States has recently exported some ethanol, these exports are anticipated to end by 2015 as domestic supply is diverted to satisfy the RFS mandates. As a result, projected U.S. exports in 2015 fall back to their 2005 level of nearly zero.

Projecting the state of the ethanol market in 2015 is complicated by substantial uncertainty about policy and the evolution of the petroleum, biofuels, and agricultural markets. On the policy front, the demands of the RFS and the future of the VEETC and the ODC after their slated expiration at the end of 2011 have important implications for the restrictiveness of import restraints for imported ethanol. To meet the demands of the RFS, the current projection anticipates that substantially more sugar-based ethanol will need to be imported to reach the 2015 renewable fuel targets. However, it is also possible that waivers will be granted that relax some RFS targets, lessening the need to rely on imported ethanol to reach these targets. The projection assumes that the existing ODC will be renewed or a similar plan introduced by the end of 2011. If the ODC does indeed expire at the end of 2011, the benefits conferred by the origin quota would be largely eliminated; if imports under the origin quota disappeared, so would any effect on import prices. Because of the uncertainty surrounding the future of the U.S. ethanol market, box 2.1 analyzes the effects of liberalization in plausible alternative projections. The box shows that reduced import prices following the elimination of the ODC would substantially reduce the estimated restrictiveness of the ethanol restraints.[22]

Effects of Liberalization Relative to Projected Trends

Liberalization of tariffs and origin quotas would increase U.S. welfare by $1,513 million, compared to an increase of $356 million in the previous report. The increase in welfare is driven principally by the projected increase in ethanol imports in 2015 as compared to 2013 in order to satisfy the requirements of the RFS. Removing the origin quota would reduce import prices of ethanol by 15 percent, as compared to 25 percent in the previous update of this report.[23] The elimination of origin quotas represents approximately 84 percent of the gain in welfare from liberalization. Summary results from liberalization are shown in table 2.3; sectoral impacts of the liberalization are shown in figures 2.2 and 2.3 and in appendix table E.5.

The largest effects would occur in the ethanol sector itself, while modest effects are anticipated in related commodities. Elimination of tariffs and the origin quota would

[21] The supply of domestic ethanol derived from other feedstocks is expected to grow, but is not anticipated to play an important role by 2015. In 2005, cellulosic ethanol was not produced in commercial quantities.

[22] The *Import Restraints* reports do not model the implications of changes in domestic tax policy. Thus, this update does not estimate the effects of eliminating the VEETC.

[23] The 25 percent price gap used in the previous (sixth) update was based on the difference between Brazilian and U.S. prices in 2009, when U.S. imports entering under the origin quota (employing Brazilian feedstock) were common.

BOX 2.1 Effects of liberalization in alternative projections of the U.S. ethanol market

The targets specified in the RFS generate uncertainty about the future U.S. market for ethanol that is largely absent from projections in other sectors (such as dairy) that the Commission considers in this update. To address this uncertainty, the Commission has examined the effect of plausible alternative projections of the U.S. ethanol market in 2015. The prices and quantities in these alternatives differ from those in the current projection used in the main text.

The price of imported ethanol is one important area of uncertainty. The current projection assumes a 15 percent gap between the U.S. price of ethanol and the lower world price. To evaluate such effects, the Commission considered two possibilities: (a) a 25 percent gap, which matches the value used in the previous update of this report, when such imports were more prevalent, and (b) the elimination of the price gap, consistent with the expiration of the ODC (which would eliminate incentives to import under the origin quota). If the price gap for imported ethanol were 25 percent, welfare gains from liberalization would rise from $1,513 million to $2,585 million. If there were no price gap in 2015, however, the welfare benefits would total only $240 million.

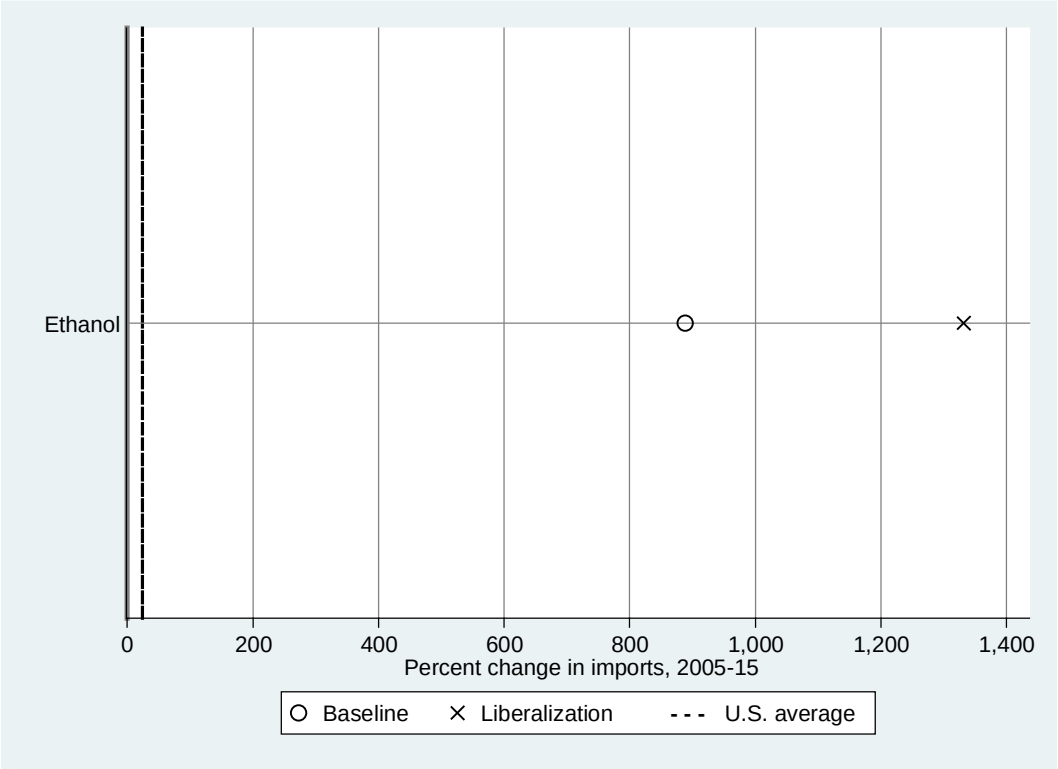
U.S. market conditions for ethanol in 2015 will also depend on the future world price of petroleum. Since ethanol is a substitute for petroleum, prices of the two goods are tightly linked. Future petroleum prices in the current projection are based on the 2015 central forecast by the U.S. Energy Information Administration (EIA) of $88 per barrel (in 2005 dollars).[a] The EIA also projects low and high prices of oil for 2015 of $48 and $134, respectively. If future oil prices were only $48 per barrel, estimated welfare from liberalization of ethanol import restraints would expand slightly, to $1,567 million, because U.S. ethanol production would decline while imports would rise relative to the base case. With high oil prices, the benefits of liberalization would contract slightly, to $1,282 million.

Other developments, particularly technological improvements, could have important effects on the ethanol market in 2015. For example, if cellulosic ethanol or other advanced technology biofuels were to expand to commercially significant quantities more quickly than anticipated, this could substantially reduce the need for imported ethanol. Similarly, any relaxation in the RFS standards for 2015 could also reduce import demand. Reductions in U.S. imports of ethanol would lower the welfare gains from liberalization.

[a]USDOE, EIA, *Annual Energy Outlook 2010*, 2010, table C1.

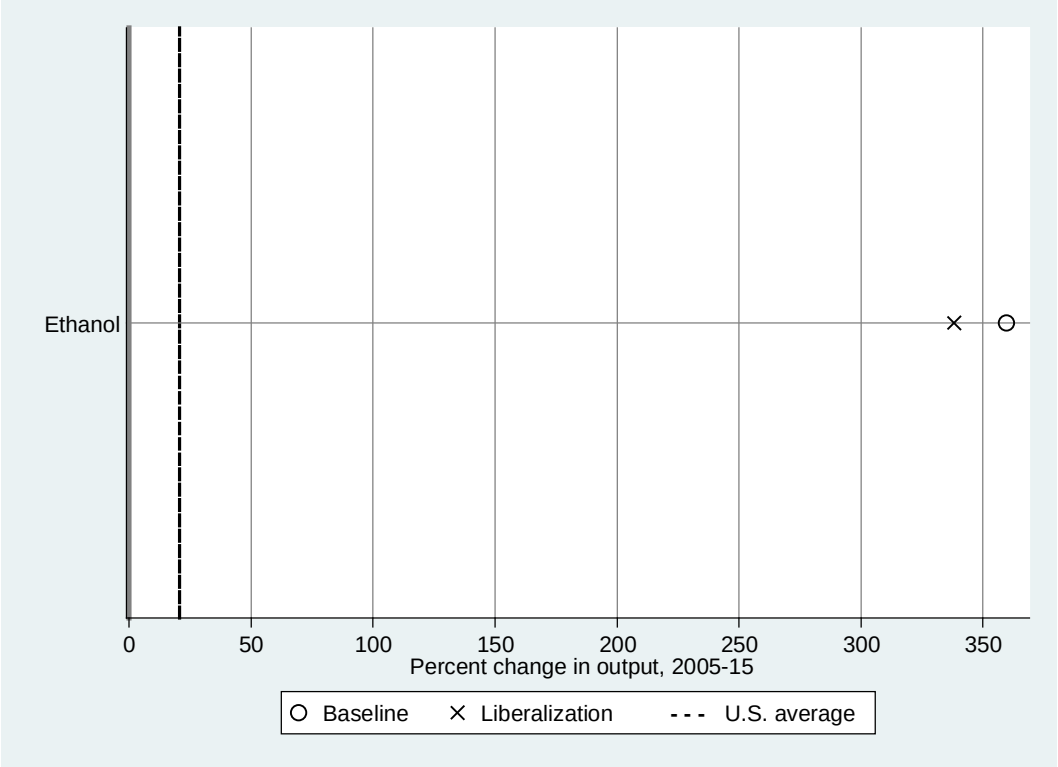
lower the landed, duty-paid price of imported ethanol by 20 percent from the projected 2015 baseline value (appendix table E.5.), increasing imports by 45 percent. The anticipated decline in domestic output is 2.2 percent, somewhat less than the prior study's estimated decline of 2.6 percent, due primarily to the more modest price effect of the origin quota. Output of commodities other than ethanol that are produced by the corn milling industries are anticipated to expand slightly, as these markets become relatively more attractive with the decline in price for ethanol. Production of corn is also expected to contract by about 1 percent as a result of the decline in domestic production of corn-based ethanol. Ethanol is predominantly produced by the dry corn milling industry; the contraction in ethanol production causes employment in dry corn milling to decline by about 6 percent. The decline in corn-based ethanol also leads to a 1 percent contraction in employment in feed grains production, which includes corn.

FIGURE 2.2 Percent change in imports of ethanol, baseline projection and liberalization, 2005–15



Source: Commission estimates.

FIGURE 2.3 Percent change in output of ethanol, baseline projection and liberalization, 2005–15



Source: Commission estimates.

Dairy Products

The U.S. dairy industry comprises farms that produce milk and facilities processing milk into foods such as butter, cheese, ice cream, yogurt, and infant formula. The facilities also produce numerous products used mostly as inputs into processed foods, such as nonfat dry milk (NDM), whole milk powder, whey, lactose, milk protein concentrates, casein, and milk albumin.[24] U.S. shipments of dairy products declined during the U.S. recession, from $84.6 billion in 2007 to $78.8 billion in 2009 (table 2.4). U.S. international trade in dairy products, which continues to be small relative to total domestic production, was also substantially affected by the downturn. Imports fell to below $2 billion and remain suppressed, while dairy exports have almost returned to their 2008 peak of $3.5 billion.

U.S. imports of dairy products largely consist of either high-end consumer items, such as European specialty cheeses and novelty ice cream, or intermediate inputs not produced domestically in sufficient quantities, such as casein and milk protein concentrates. Major U.S. dairy exports in 2010 were largely bulk commodity goods, such as NDM, cheese, whey, milk albumin, lactose, and butter.

Nature of Trade Restraints

The dairy sector is subject to relatively high average tariffs and the greatest number of quantitative restraints of any sector in this report, with 27 separate dairy TRQs.[25] Moreover, import restraints affect a wide variety of dairy products, including fluid milk and cream, butter, cheese, powdered milk products, ice cream, infant formula, and dairy-based animal feeds.[26] The restraints operate in conjunction with a complex system of federal, state, and local laws to maintain price and production supports for the domestic dairy industry. Federal programs include domestic price supports, milk marketing orders, the Dairy Export Incentive Program (DEIP), and domestic and international food aid programs.[27]

Dairy products imported into the United States that were not subject to TRQs, including certain varieties of cheese (mainly cheese made of sheep and goat's milk) and certain inputs to processed foods, accounted for roughly one-half of the total value of U.S. dairy imports in 2009 and 2010.[28] Dairy imports not subject to TRQs typically face low or

[24] For detailed information on the U.S. dairy industry and globally traded dairy goods, see USITC, *Conditions of Competition for Milk Protein Products in the U.S. Market*, 2004.

[25] U.S. domestic and trade policies for dairy products were developed in the 1930s in response to price declines in the Great Depression. As part of the agreement establishing the World Trade Organization (WTO) that went into effect on January 1, 1995, a system of TRQs replaced fixed import quotas that were inconsistent with WTO disciplines.

[26] In addition, some food preparations and chocolate products covered in chaps. 18, 19, and 21 of the HTS that contain dairy products also face import restraints.

[27] The DEIP covers NDM, butterfat, and various cheeses. It helps U.S. dairy exporters match prevailing prices in certain export markets by paying cash bonuses. The DEIP is designed to develop export markets where U.S. products are not competitive because of subsidized dairy products from other countries. As part of its WTO commitments resulting from the WTO Agreement on Agriculture, the United States has established annual export subsidy ceilings by commodity with respect to maximum permitted quantities and maximum budgetary expenditures. USDA did not fund the DEIP from the beginning of fiscal year 2005 until May 2009 because U.S. export prices for NDM, butter, and many varieties of cheese were globally competitive. For more information on DEIP, see USDA, FAS, *Fact Sheet*, November 2009.

[28] The National Milk Producers Federation (NMPF) estimates the percent of U.S. dairy imports not subject to TRQs to be somewhat higher, equal to 62 percent in 2009. The difference is likely to be the result of how dairy imports are defined. NMPF, written submission to the USITC, February 4, 2011, 5.

TABLE 2.4 Dairy products: Summary data and simulation results

Item	Summary data 2007	2008	2009	2010	Projected change, 2005–15 (%)	Effect of liberalization (%)
Employment	Employees					
Total dairy	129,600	131,900	131,100	([a])	7.5	–1.0
Butter	([b])	([b])	([b])	([a])	11.0	–2.1
Cheese	40,000	42,200	41,600	([a])	13.8	–1.6
Dry/condensed milk products	15,000	14,200	13,100	([a])	24.1	–2.8
Fluid milk	55,600	57,300	58,000	([a])	5.5	–0.3
Ice cream	19,000	18,200	18,400	([a])	–10.3	–0.2
Shipments	Millions of $					
Total dairy	84,562	90,610	78,783	([a])	19.9	–1.2
Butter	2,520	2,729	2,437	([a])	22.3	–2.0
Cheese	29,754	34,234	28,053	([a])	27.3	–1.6
Dry/condensed milk products	13,935	15,122	13,017	([a])	32.3	–4.2
Fluid milk	29,384	30,623	27,348	([a])	15.7	–0.2
Ice cream	8,969	7,902	7,928	([a])	–3.0	–0.1
Imports						
Total dairy	2,229	2,533	1,977	1,984	–33.5	62.6
Butter	65	49	44	46	–6.1	51.9
Cheese	1,108	1,168	1,005	967	–27.9	64.7
Dry/condensed milk products	1,010	1,270	873	913	–45.0	65.0
Fluid milk	8	8	8	8	–71.4	35.7
Ice cream	39	38	47	49	43.6	24.1
Exports						
Total dairy	2,754	3,501	2,024	3,444	79.1	4.3
Butter	112	272	81	202	2516.2	3.5
Cheese	388	570	430	694	113.7	10.0
Dry/condensed milk products	2,158	2,555	1,404	2,404	11.2	1.7
Fluid milk	37	42	44	60	257.5	0.3
Ice cream	60	62	64	83	48.4	0.3

Sources: Commission estimates for 2007 employment data based on USDA price and production data taken from USDA, AMS, *Dairy Market Statistics,* 2008; non-employment 2007 data taken from USDOC, Census, *Annual Survey of Manufactures 2008* (accessed February 25, 2011); 2007 ice cream pricing data taken from Gould, "Understanding Dairy Markets" (accessed April 8, 2011); 2008 and 2009 data taken from USDOC, Census, *Annual Survey of Manufactures 2009* (accessed February 25, 2011); data on U.S. imports and exports taken from USITC DataWeb/USDOC; Commission estimates for projection and liberalization.

Note: Model sectors are determined by U.S. input-output classifications and may differ from summary data. Projected changes are based on quantity trends. Effects of liberalization represent deviations from the projected changes. See app. E for details and table E.6 for sector definitions.

[a]Not available.
[b]Employment data for butter manufacturing is combined with fluid milk and cream in USDOC, Census, *Annual Survey of Manufactures* (accessed February 25, 2011).

moderate tariffs. Casein, caseinates, milk protein concentrates, and milk albumin were imported largely free of duty and accounted for more than one-third (34 percent) of all dairy imports in 2010 (table 2.5).

TABLE 2.5 Dairy import restraint overview, representative products and sources, 2010

Item, with selected sources	AVE tariff rate (%)		Imports (1,000 kg)		TRQ	
	In-quota[a]	Over-quota[b, c]	In-quota[a]	Over-quota[b, c]	Fill rate (%)	Allocation (1,000 kg)
Subject to TRQ[d]						
Butter						
From the EU	2.0	17.8	77.2	55.0	80.3	96.2
From New Zealand	4.9	8.8	38.6	127.5	25.6	150.6
From all other countries	1.0	20.9	3,168.1	86.9	47.1	6,730.2
Skim milk powder	0.6	16.4	107.0	36.4	2.0	5,261.0
Whole milk powder	4.5	13.3	1,234.1	120.2	37.2	3,321.3
Cheddar cheese						
From FTA beneficiaries	0.2	4.5	897.6	483.1	33.6	2,670.0
From the EU	11.4	15.9	1,203.3	775.2	91.6	1,313.0
From New Zealand	10.9	—	168.3	0.0	2.1	8,200.0
From all other countries	1.1	17.0	3,594.9[e]	183.0	1,498.6[e]	239.9
Swiss cheese						
From the EU	6.2	21.6	10,804.5	17.1	47.2	22,900.0
From Norway	6.1	—	6,497.6	0.0	94.4	6,883.0
From Switzerland	6.2	14.3	2,030.3	1.0	55.9	3,630.0
From all other countries	5.4	22.3	58,901.4	6.2	57.6	102,172.8

Not subject to TRQ[f]	Total AVE tariff rate (%)	Total imports (1,000 kg)
Milk protein concentrates	0.1	58,481.2
Casein and caseinates	0.0	63,466.0
Sheep's milk cheeses	0.1	24,015.7
Milk albumin	0.0	7,166.2

[a]Commission estimate. Imports for specific countries may have entered under the "all other country" and FTA TRQs.
[b]Over-quota imports may enter under separate tariff lines.
[c]Excluding over-quota shipments from FTA partners that enter duty free.
[d]Included in the following U.S. Additional Notes in HTS chap. 4: Butter (note 6); skim milk powder (note 7); whole milk powder (note 8); cheddar cheese (note 18); swiss cheese (note 25).
[e]Import quantities from Australia, Canada, Egypt, India, Ireland, Jamaica, New Zealand, and the United Kingdom subject to licensing requirements under the "any country" TRQ for cheddar cheese (note 18) far exceeded the allocated TRQ volume. Therefore, the fill rate is greater than 100 percent.
[f]Included in the following HTS codes: Milk protein concentrates (0404.90.10 and 3501.10.10); casein and caseinates (3501.10.50 and 3501.90.60); cheeses made from sheep milk (0406.90.56, 0406.90.57, and 0406.90.59); milk albumin (3502.20).

Dairy products that are subject to TRQs encompass about two-thirds of the 392 HTS 10-digit tariff classifications in the dairy sector. Most of the 27 TRQs have country-specific in-quota volume allocations. U.S. imports of dairy products subject to these TRQs are primarily cheese, ice cream, butter, yogurt, and milk powder. In-quota tariff rates on these products are generally below 10 percent ad valorem equivalent (AVE), while over-quota AVE rates can exceed 20 percent. For some products, such as butter from New Zealand or cheddar cheese from the EU, over-quota imports are common because the over-quota AVE is only slightly higher than the in-quota rate. For other products, over-quota imports occur because certain U.S. FTAs allow duty-free over-quota imports from beneficiary countries (particularly Mexico and Australia).

TRQ fill rates—the ratio between actual imports under the quota and the allotted quota level—reflect the restrictiveness of restraints: the higher the fill rate, the more restrictive the restraint. In 2009, fill rates for butter, butter substitutes, and whole milk powder typically met or exceeded 90 percent, including allocations for large global producers

such as New Zealand and the EU. In the cheese categories, 2009 TRQs were effectively filled (over 85 percent) for products such as Italian-style and cheddar (although other types of cheese had lower fill rates).[29]

In general, however, fill rates for U.S. dairy TRQs were significantly lower in 2010 than in 2009, reflecting global market forces such as rising demand in emerging markets.[30] Global dairy exporters such as New Zealand, Australia, and to a certain extent the EU have begun to export their production surpluses to expanding markets in Asia and the Middle East rather than to the United States. As dairy prices offered by rapidly developing economies converge with U.S. prices, the United States is no longer always the destination market of choice. Instead, major dairy exporting countries (including the United States) are responding to market signals by shifting sales to regions of the world with traditionally low consumption of dairy products. These trends are expected to continue through the medium term (and likely longer) and are reflected in the sector-specific forecasts for dairy products in the simulation.

Projected Industry Trends, 2005–15

The projection for the dairy industry anticipates a continuation of recent favorable trends.[31] U.S. production across all dairy sectors expands by about 20 percent over the period 2005 to 2015, partly in response to rising global demand. Exports are expected to increase by 79 percent over the 10-year period, while imports are anticipated to decline by about a third. Overall employment is expected to rise slowly, by less than 1 percent per year, while rising productivity accommodates growth in output.

Effects of Liberalization Relative to Projected Trends

Liberalization of U.S. import restraints on dairy products is anticipated to increase U.S. welfare by $223 million in 2015, much less than the increase of $732 million by 2013 that was estimated in the previous report. Liberalization is modeled by removing all TRQs and duties on butter, cheese, ice cream, fluid milk, and dry, condensed, and evaporated dairy products. Table 2.4 and figures 2.4 and 2.5 show the summary results of this liberalization. Results for specific dairy sectors, as well as for sectors that provide inputs to dairy production, are presented in appendix table E.5. Among dairy products, the greatest effect is observed in condensed and evaporated dairy products, the sector with the greatest overall trade restraints (see table 1.2).[32] Rising world prices for dairy products have lessened the restrictiveness of dairy TRQs, moderating trade restraints in the industry substantially since the last study. This in turn has lessened the estimated benefits of dairy liberalization.

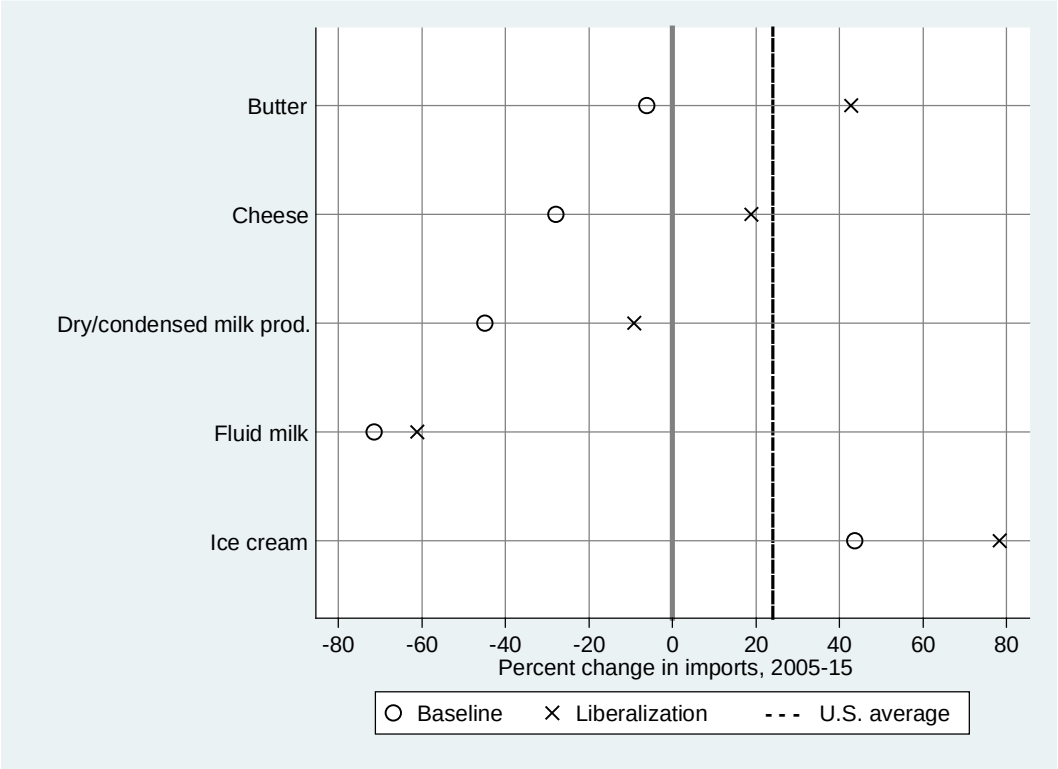
[29] Even in cases where broad quota categories remain unfilled, TRQs can restrain imports if country-specific quantitative limits are filled and importers are forced to shift to other suppliers.

[30] See box 1.1 for a more detailed discussion of declines in imports subject to dairy TRQs.

[31] To produce the 2005–15 projection, observed quantities of U.S. dairy imports, exports, and output in the 2005–10 period were combined with dairy supply and use projections from the Food and Agricultural Policy Research Institute (FAPRI) for 2010–15. FAPRI, *U.S. Baseline Briefing Book*, 2011. See app. E for additional details.

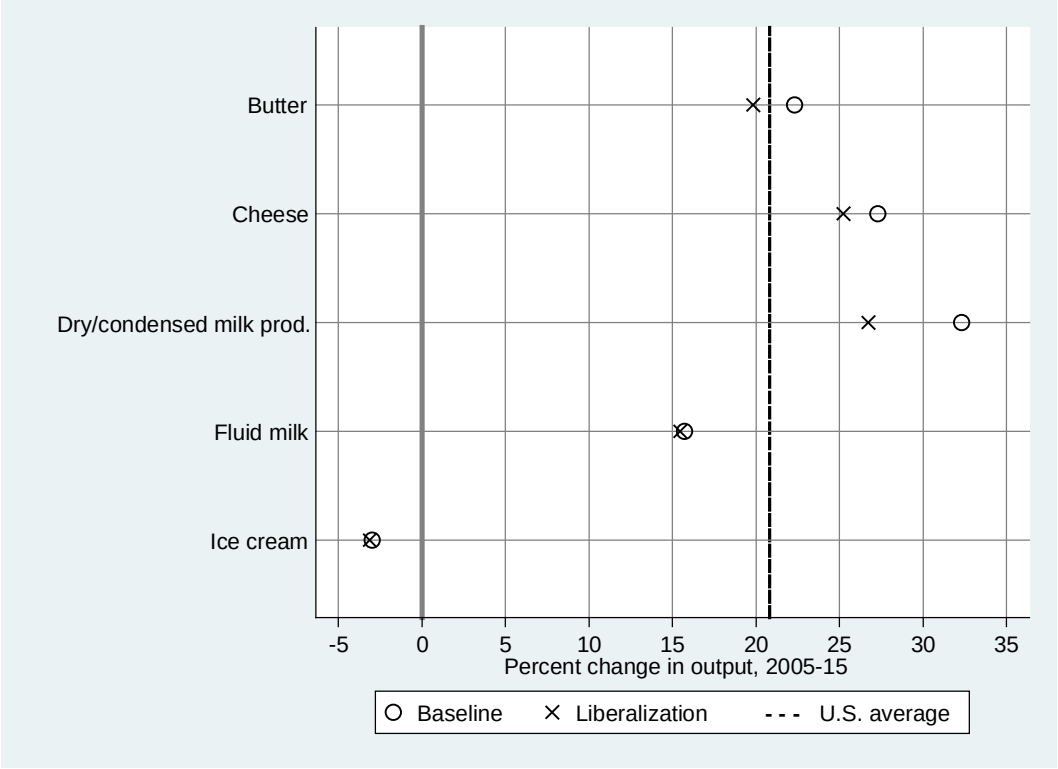
[32] These restraints include both tariffs and TRQ effects, as measured by the effect that each has on the price of imports.

FIGURE 2.4 Percent change in imports of dairy, baseline projection and liberalization, 2005–15



Source: Commission estimates.

FIGURE 2.5 Percent change in output of dairy, baseline projection and liberalization, 2005–15



Source: Commission estimates.

Ending import restraints is expected to bring down the landed, duty-paid price of imports, especially for condensed and evaporated dairy products, butter, and cheese (appendix table E.5). These price declines lead to increases in imports, led by condensed and evaporated dairy products, cheese, and dry dairy products (up 76 percent, 65 percent, and 58 percent, respectively). As a result of increased imports, domestic production would decrease, led by condensed and evaporated dairy products (−5 percent), dry dairy products (−2 percent), and butter (−2 percent) (appendix table E.5); employment would decline by roughly similar proportions. Despite the decline in U.S. production, the drop in domestic prices relative to world prices for most dairy commodities would lead to increased exports. This is especially true for cheese, where exports would increase by 10 percent, and for condensed dairy products, where exports would increase by 6 percent (table E.5).

Tobacco and Tobacco Products

Flue-cured and burley tobaccos, the two principal tobacco types produced in the United States, are primarily used in the manufacture of cigarettes.[33] U.S. tobacco has long been regarded as among the highest-quality tobaccos produced in the world, but other suppliers such as Brazil now produce comparable tobacco at lower costs, which has led to a decrease in U.S. exports and an increase in U.S. tobacco imports in recent years. Imports account for a very small share of consumption, however, and most cigarettes consumed in the United States are domestically produced.

The value of U.S. production of flue-cured and burley tobacco totaled $1.3 billion in 2010, essentially unchanged from 2007 (table 2.6); however, production volumes declined by 12 percent to 713 million pounds during 2007–10.[34] By value, U.S. production of cigarettes declined by 26 percent. The fall in output during the period reflects declining domestic demand for cigarettes and a drop in demand for U.S. tobacco and cigarette exports owing to strong competition from foreign producers—particularly Brazil, the leading global supplier. U.S. exports of unmanufactured tobacco fell moderately (by 9 percent) during 2007–10, while exports of cigarettes fell at a much higher rate (64 percent), from over $1 billion to $371 million. U.S. exports to Japan, the leading market, fell by over 60 percent by volume during the period, as cigarettes from Germany and the Netherlands displaced U.S. exports. Declining U.S. demand for cigarettes led to lower U.S. imports of tobacco. U.S. imports of unmanufactured tobacco fell moderately by value, but dropped by 33 percent by volume during 2007–10.[35] U.S. cigarette imports, which make up only a small share of total U.S. cigarette consumption, declined by 19 percent.

[33] Flue-cured and burley tobacco varieties differ in how they are cured (dried)—flue cured tobacco is dried with heat, while burley tobacco is air dried. Most tobacco leaf is cured on the farm, after which it is processed at a factory into "unmanufactured tobacco," an intermediate product. To produce unmanufactured tobacco, the factory de-stems the cured leaf, re-dries it, and cuts it into strips for use by cigarette manufacturers. Most tobacco traded internationally is unmanufactured tobacco.

[34] USDA, NASS, Database (accessed February 22, 2011).

[35] According to import quantities in USITC DataWeb/USDOC.

TABLE 2.6 Tobacco: Summary data and simulation results

Item	Summary data				Projected change, 2005–15 (%)	Effect of liberalization (%)
	2007	2008	2009	2010		
Employment	Employees					
Unmanufactured tobacco[a]	2,600	2,400	1,900	([b])	–10.6	–3.4
Cigarettes	16,600	15,700	12,300	([b])	–2.7	–0.1
Shipments	Millions of $					
Unmanufactured tobacco[c]	1,329	1,488	1,511	1,254	–2.9	–3.2
Cigarettes	34,075	30,544	23,537	([b])	–4.9	0.1
Imports						
Unmanufactured tobacco[d]	398	423	429	393	–25.3	72.8
Cigarettes	170	165	156	137	–57.6	7.3
Exports						
Unmanufactured tobacco[d]	1,016	1,078	977	926	7.4	4.8
Cigarettes	1,012	705	414	371	–77.2	1.6

Sources: USDA, NASS; USDOC, Census, *Annual Survey of Manufactures,* 2007–09; USITC DataWeb/USDOC; Commission estimates for projection and liberalization.

Note: Model sectors are determined by U.S. input-output classifications and may differ from summary data. Projected changes are based on quantity trends. Effects of liberalization represent deviations from the projected changes. See app. E for details and table E.6 for sector definitions.

[a]Stemming and redrying sector, excluding tobacco farmers.
[b]Not available.
[c]Farm value, primarily flue-cured and burley tobacco.
[d]Stemmed and redried flue-cured and burley tobacco.

Nature of Trade Restraints

Cigarettes are subject to a 7.6 percent AVE tariff. A TRQ established in 1995 is applied to imports of unmanufactured tobacco[36] and manufactured tobacco used in the production of cigarettes destined for the U.S. market.[37] The total TRQ quantity for the 2010 quota year[38] was 150,700 metric tons (mt), which was divided into nine separate country or trading group allotments and a small residual allocation for all other countries (table 2.7). Brazil accounted over one-half (53 percent) of the total TRQ in 2010, while Malawi and Zimbabwe, other suppliers of high-quality tobacco, accounted for the next largest shares.[39]

[36] Generally, more than 90 percent of the value 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 are included in HTS subheadings 2401.10.63, 2401.20.33, 2401.30.33, 2401.30.35, 2401.30.37, 2403.10.60, 2403.91.45, and 2403.99.60.

[37] The tobacco TRQ was established by Presidential proclamation in 1995 to replace a WTO-inconsistent domestic content rule. The earlier rule was put in place in 1993 after U.S. imports of unmanufactured leaf tobacco rose dramatically (more than 150 percent) during the 1990–92 period. For additional information in the establishment of the tobacco TRQ, see USITC, *Import Restraints, Third Update,* 2002, 88–89.

[38] The TRQ quota year runs from September 13 to September 12 of the following year. Quota year 2010 lasted from September 13, 2009, to September 12, 2010.

[39] High-quality "flavor" tobacco is tobacco that imparts the aroma and taste characteristics to cigarettes, in contrast to filler-type tobacco. Brazil, Argentina, and Zimbabwe are the leading foreign suppliers of high-quality flue-cured tobacco; Brazil and Malawi are the leading suppliers of high-quality burley tobacco.

TABLE 2.7 Tobacco: TRQ fill rates,[a] imports, and allocations

Country	TRQ fill rates (%) 2007	2008	2009	2010	Imports 2010	Allocation 2010
					Thousands of kg	
Brazil	100	99	87	73	58,306	80,200
Malawi	79	19	85	70	8,438	12,000
Zimbabwe	(+)	1	(+)	0	0	12,000
Argentina	100	100	100	64	6,836	10,750
EU	49	78	86	49	4,872	10,000
Guatemala[b]	31	40	33	56	5,641	10,000
Thailand	100	100	84	8	544	7,000
Philippines	36	90	85	100	2,993	3,000
Chile[b]	0	0	1	0	0	2,750
Other countries	87	100	100	100	3,017	3,000

Source: DHS, U.S. Customs and Border Protection, Quota Enforcement and Administration Branch.

Note: The symbol (+) indicates a small positive value of less than 0.5 percent.

[a]Fill rates, allocations and imports are for the TRQ year, ending on September 12 of the stated year.
[b]Table reflects TRQ allocation and fill rates. It does not include additional access under FTAs.

In-quota imports for unmanufactured tobacco—the bulk of the tobacco that is subject to the TRQ—are subject to a calculated duty of 10 percent AVE.[40] All over-quota imports are subject to a 350 percent ad valorem duty. A duty drawback program exists for all imports (in-quota and over-quota) that are reexported either as unmanufactured tobacco or in cigarettes. Countries with PTAs with the United States are either not subject to quantitative restrictions set forth in the TRQ or are given additional access under preferential rates.[41]

As noted, weak domestic demand for cigarettes led to a substantial fall in tobacco imports during quota year 2010. Tobacco TRQ imports declined by 34 percent by volume from the previous quota year. The TRQ was restrictive only for the Philippines and the "other countries" group, both of which registered fill rates of 100 percent in 2010.[42] However, these countries together accounted for just 4 percent of the total tobacco TRQ. Brazil, the dominant U.S. supplier of flue-cured and burley tobacco, registered a fill rate of just 73 percent, down from previous years (table 2.7). Imports from Argentina also declined, after filling its quota the three preceding quota years.

Projected Industry Trends, 2005–15

The baseline simulation projects a modest contraction in U.S. production of tobacco and most tobacco products by 2015, though production of cigars and of chewing and smoking tobacco is expected to expand somewhat. Imports of unmanufactured tobacco and

[40] Tariffs on tobacco subject to the TRQ ranged from free to 40.9 cents per kg in 2010, with most in-quota tobacco (HTS subheading 2401.20.85) entering the United States subject to a duty of 37.5 cents per kg.

[41] Canada, Mexico, and Israel are not subject to the quantitative restrictions set forth in the TRQ, pursuant to FTAs with those countries. Under other U.S. bilateral FTAs, certain countries have been provided additional access under preferential rates; however, most of these countries are not traditional tobacco sources. Chile, which already has a TRQ allotment, was granted additional access under the FTA, but Chile is not an important U.S. tobacco supplier and routinely has one of the lowest fill rates of countries that were provided TRQ access in 1995. For CAFTA-DR partners, in-quota duties are free, while over-quota duties are 210 percent ad valorem. The majority of U.S. imports from CAFTA-DR are cigars and cigar tobacco, which are not subject to the TRQ.

[42] The "other countries" allotment generally fills soon after the beginning of the quota year, as these suppliers compete among themselves for the relatively small allocation. However, the relatively low-quality filler-type tobacco that these countries currently produce is not directly competitive with tobacco from the foreign suppliers that have country-specific allocations.

cigarettes are anticipated to decline substantially, reflecting the continuing decline in U.S. smoking rates. Imports of cigars and chewing and smoking tobacco, however, are expected to rise substantially, reflecting the overall expansion in demand for these tobacco products. Cigarette exports are expected to contract by three-quarters, while cigar and chewing and smoking tobacco exports decline by 6 to 8 percent. Employment in these sectors follows production trends, with employment in unmanufactured tobacco declining by about 11 percent and in cigarette manufacturing by 3 percent.

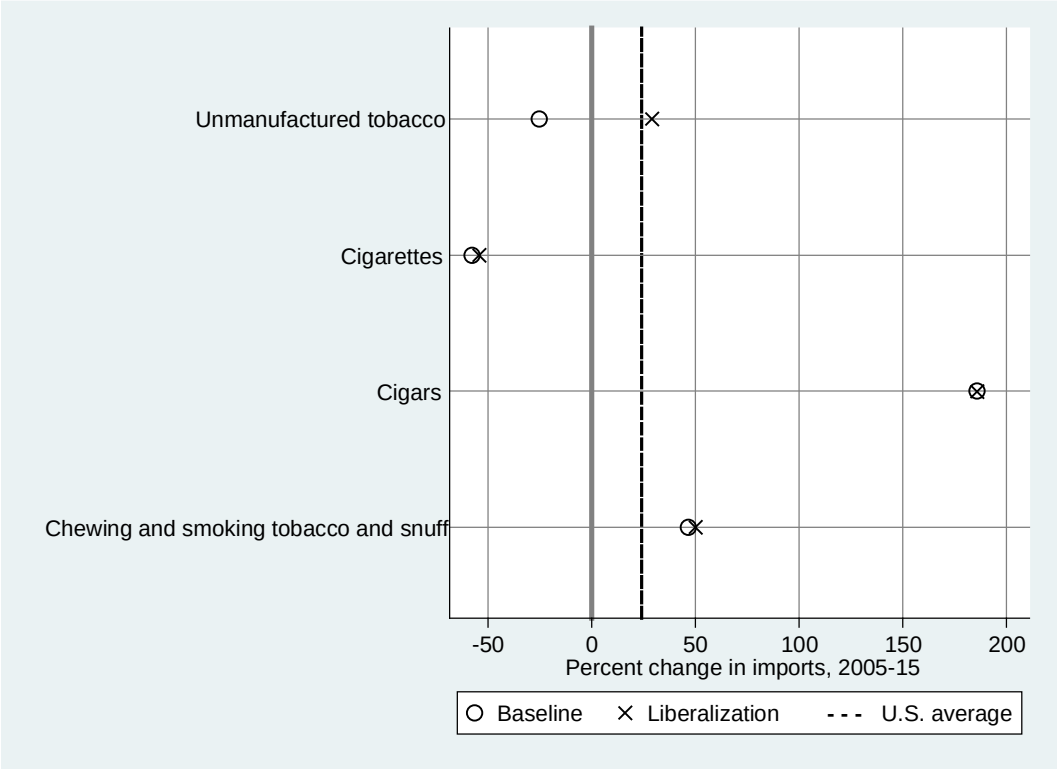
Effects of Liberalization Relative to Projected Trends

Removing all TRQs and tariffs on these products is estimated to increase U.S. welfare by $63 million, compared to $99 million by 2013 in the previous report. The effects of liberalizing U.S. imports of tobacco and tobacco products were modeled by removing the TRQ on unmanufactured tobacco and by eliminating the tariffs on imports of cigarettes. Table 2.6, figures 2.6 and 2.7, and appendix table E.5 show the sectoral effects of the trade liberalization for tobacco products relative to the 2015 baseline.

Because TRQs are anticipated to be less restrictive in the current analysis, elimination of tobacco TRQs and tariffs would reduce the landed, duty-paid price of tobacco to a lesser extent than in the previous study. The landed, duty-paid price of unmanufactured tobacco would decline by about 22 percent, while that of imported cigarettes would fall by about 4 percent (appendix table E.5). The import prices of other tobacco products would decline by lesser amounts.

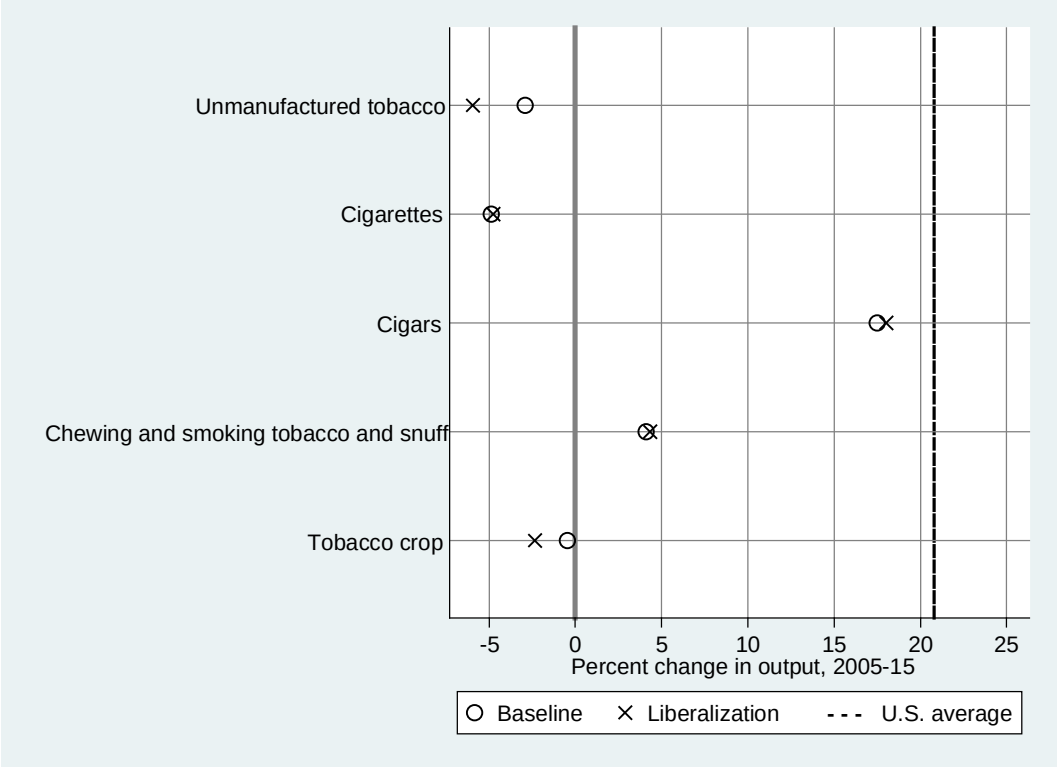
In the USAGE model, unmanufactured tobacco of any origin represents 18 to 25 percent of the value of intermediate inputs into the cigarette, cigar, and other tobacco products sectors, though imported tobacco comprises only 2 percent of the tobacco needed to produce U.S. cigarettes and 3 percent of that needed for cigars and other tobacco products. Liberalization of tariffs on tobacco would substantially increase imports and significantly contribute to a decline in the price of domestically produced downstream products, leading to rises in exports between 1 and 2 percent. Liberalization of restraints on imports of tobacco products themselves would lead to only modest increases in imports of cigarettes (7 percent) and of chewing and smoking tobacco and snuff (2 percent). The estimated increase in tobacco imports causes tobacco shipments and associated employment to decline by about 3 percent, while output and employment in the tobacco farming sector would decline by about 2 percent. Output and employment would rise in all tobacco products sectors, except for cigarettes, for which employment would fall slightly (appendix table E.5).

FIGURE 2.6 Percent change in imports of tobacco, baseline projection and liberalization, 2005–15



Source: Commission estimates.

FIGURE 2.7 Percent change in output of tobacco, baseline projection and liberalization, 2005–15



Source: Commission estimates.

Sugar and Sugar-Containing Products

The United States ranks fifth in the world in sugar consumption, accounting for 5 percent of global consumption, or 11.2 million short tons, raw value (strv) in marketing year (MY) 2010.[43] U.S. sugar consumption has increased at an annual average rate of about 2 percent since 2005, mainly reflecting population growth. However, U.S. per capita sugar consumption, which totaled 66 pounds in calendar year (CY) 2010, has been in a long-term decline, having peaked at 102 pounds in 1972.[44] The decline mainly reflects a shift to lower-cost alternatives, principally high-fructose corn syrup (HFCS), by primary users, such as soft-drink manufacturers. More recently, consumer concerns about obesity have also played a role in the decline. In CY2010, refined sugar accounted for about 50 percent of the total U.S. consumption of caloric sweeteners, down from 86 percent in 1967, the year before consumption of HFCS was first recorded. This share has remained relatively stable in recent years, as the shift to HFCS has matured. However, the share of the U.S. caloric sweetener market share held by refined sugar has rebounded slightly since 2005, as consumer preferences shifted demand away from HFCS back to sugar in certain products such as soft drinks, as well as in food formulations.[45]

Sugar is produced in the United States both from sugarcane and sugar beets. The sugarcane sector comprises two distinct segments: sugarcane milling and raw cane sugar refining. First, sugarcane is milled to produce raw cane sugar.[46] Raw cane sugar is then further refined at raw cane sugar refineries. Refined beet sugar, by contrast, is produced from sugar beets in a continuous process. Refined beet sugar and refined cane sugar are virtually identical and are interchangeable. Refined sugar is used directly by consumers and as an input in the manufacture of a multitude of food items. Many of these food items are included in the sugar-containing products (SCP) sector.[47] While the primary focus of this section is the sugar sector, there is a secondary discussion of SCPs because of the quantity of sugar contained within these products.[48]

U.S. producers supplied approximately 73 percent of U.S. sugar consumption in MY2010.[49] The value of U.S. raw cane sugar production totaled $2.3 billion in MY2010 (table 2.8). The value of U.S. refined sugar production totaled $7.5 billion in the same year, with refined beet sugar accounting for 58 percent of the total. These values were substantially above those recorded in previous years, as sugar prices increased

[43] Data are on a marketing year basis, generally October of the previous year through September of the stated year. USDA, FAS, *Production Supply and Distribution Online* (accessed February 22, 2011).

[44] USDA, ERS, *Sugar and Sweetener Yearbook Tables* (accessed June 1, 2011).

[45] USDA, ERS, *Sugar and Sweetener Yearbook Tables* (accessed May 23, 2011); Kelso, "Sugar's Comeback Slowly Reaching into QSR," June 28, 2010.

[46] Sugarcane and sugar beet production (NAICS categories 111930 and 111991, respectively) are not explicitly included in the sugar sector, as the import restraint is applied to the manufactured product. In addition, the United States does not trade in sugarcane and sugar beets. However, the import restraints affecting the sugar sector have an indirect effect on the production of sugarcane and sugar beets, as they are the primary inputs for sugar production. The Commission's CGE model accounts for adjustments among sectors and implicitly addresses the impact of sugar import liberalization on the sugarcane and sugar beet sector, which is discussed in this report.

[47] NAICS categories for SCPs include chocolate and confectionery manufacturing from cacao beans (31132); confectionery manufacturing from purchased chocolate (31133); nonchocolate confectionery manufacturing (31134); bread and bakery product manufacturing (31181); cookie, cracker, and pasta manufacturing (31182); and flavoring syrup and concentrate manufacturing (31193).

[48] These SCPs are not covered by TRQs.

[49] USDA, ERS, *Sugar and Sweetener Yearbook Tables* (accessed February 22, 2010). Share is for domestic food and beverage use, raw sugar basis.

TABLE 2.8 Sugar: Summary data and simulation results

Item	Summary data 2007	2008	2009	2010	Projected change, 2005–15 (%)	Effect of liberalization (%)
Employment[a]	Employees					
Total sugar crop farming	7,340	5,565	5,219	5,378[b]	4.5	–2.8
Sugarcane farming	5,606	3,976	3,675	4,076[b]	17.0	–7.7
Sugar beet farming	1,734	1,589	1,544	1,302[b]	1.9	–1.7
Total sugar processing	12,686	12,317	12,859	11,493[b]	–4.9	–1.6
Raw cane sugar	4,084	3,643	3,543	3,049[b]	3.6	–7.9
Refined cane sugar	2,682	2,622	3,305	2,746[b]	–1.9	2.4
Refined beet sugar	5,920	6,052	6,011	5,698[b]	–9.0	–1.8
Shipments[c]	Millions of $					
Sugarcane	881	830	992	969	8.3	–7.6
Sugar beets	1,337	1,293	1,501	1,610	–2.9	–1.7
Raw cane sugar	1,435	1,459	1,465	2,322	10.0	–7.7
Total refined sugar	4,062	4,549	5,022	7,489	3.1	0.7
Refined cane sugar	1,653	1,915	2,226	3,188	6.8	2.9
Refined beet sugar	2,409	2,635	2,796	4,301	–0.8	–1.7
Imports[d]						
Total sugar	434	951	1,243	1,850	25.6	31.8
Raw cane sugar	105	622	706	1,268	4.3	36.4
Refined sugar	329	329	537	582	221.4	18.2
Exports[c]						
Total sugar[e]	21	148	87	156	21.7	8.7

Source: USDA, ERS, *Sugar and Sweetener Yearbook Tables* (accessed various dates); USDA, NASS, *Agricultural Prices*, January 31, 2011; USDA, NASS, *Crop Production 2009 and 2010 Summaries,* January 2010 and January 2011; USDOC, Census, *Annual Survey of Manufactures* (accessed February 25, 2011); and USDOL, BLS, *Quarterly Census of Employment and Wages* (accessed February 24, 2011); Commission estimates for projection and liberalization.

Note: Model sectors are determined by U.S. input-output classifications and may differ from summary data. Projected changes are based on quantity trends. Effects of liberalization represent deviations from the projected changes. See app. E for details and table E.6 for sector definitions.

[a]Reported on a calendar year basis.
[b]Employment data for 2010 are estimated based on available data for the first six months of 2010 and likely are understated owing to seasonality.
[c]Reported on a marketing year basis. Raw cane sugar is valued at the U.S. domestic price for raw sugar. Refined beet sugar is valued at the U.S. domestic wholesale price for refined beet sugar.
[d]Reported on a marketing year basis. Refined sugar imports include refined cane and refined beet sugar.
[e]Includes exports of cane and beet sugar, including refined sugar exports under the sugar reexport program, which accounted for 29 percent of the total value of U.S. sugar exports in 2010.

dramatically in MY2010. In terms of quantity, however, U.S. sugar production decreased slightly, from 8.2 million strv in MY2008 to 8.0 million strv in MY2010.[50] Annual variations in refined sugar production result largely from weather conditions that affect both sugar beet and sugarcane production, often to a varying degree. The sugar processing sector employed about 11,500 workers in CY2010.[51] Such employment has rebounded somewhat from a long-term decline resulting from industry consolidation.

[50] USDA, ERS, *Sugar and Sweetener Yearbook Table* (accessed February 23, 2011).
[51] Data for 2010 represent the first six months and may be understated owing to seasonality.

Employment in upstream sectors—sugarcane and sugar beet farming—totaled 5,378 workers in CY2010. Though it was relatively steady during CY2008–10, it was down significantly from CY2007.[52]

The United States is a net importer of sugar, mostly raw cane sugar, and typically exports a minor amount.[53] The total value of sugar imports increased substantially from MY2008 to MY2010 as a result of both rising demand and rising domestic and world prices. Imports supplied 27 percent of the U.S. sugar market in MY2010 in terms of quantity (raw basis), up from about 22 percent in MY2008. Mexico was the leading supplier of U.S. sugar imports in 2010, accounting for 24 percent of the total quantity (raw basis) of such imports in MY2010.[54] U.S. imports from Mexico have entered free of duty under the North American Free Trade Agreement (NAFTA) since January 1, 2008.

The United States also trades a significant amount of sugar in SCPs that are not subject to sugar TRQs. The net imported sugar content of such trade increased from 36,680 metric tons, raw value (mtrv) in 1995 to 616,255 mtrv in 2006 before declining to 389,903 mtrv in 2010.[55] The bulk of SCP imports consist of sugar confectionery and cocoa and cocoa preparations. The principal suppliers are Canada and Mexico, which together accounted for 71 percent of the total value of such imports during 2006–10.[56] There has been a long-term shift in production capacity of U.S. confectionery and baking companies to these countries, contributing to this trade. However, net U.S. imports of sugar in SCPs have been declining in recent years, likely the result of increased market access for U.S. SCP exports under NAFTA and other FTAs.

Nature of Trade Restraints

Trade barriers in the U.S. sugar sector are related to domestic policies that manage supplies to maintain market prices for raw cane and refined sugar.[57] If domestic prices fall below legislatively determined thresholds ("loan rates"), producers may forfeit their supplies to the Commodity Credit Corporation of the U.S. Department of Agriculture at the loan rates.[58] To keep U.S. domestic prices sufficiently above the loan rates, the United States administers a system of TRQs for imports of raw cane and refined sugar, blended sugar syrups, and certain SCPs for World Trade Organization (WTO) member countries in accordance with the WTO Agreement on Agriculture, and for other countries

[52] Between 1999 and 2009, total employment in the sugar sector (including both farming and processing) fell by 27 percent, from 24,881 to 18,078 workers, according to official government statistics. USDOL, BLS, *Quarterly Census of Employment and Wages* (accessed June 28, 2011).

[53] Some U.S. sugar exports (29 percent in 2010) fall under the refined sugar reexport program, which 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 reexported within a given time period. The refined sugar reexport 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 they need to maintain utilization of their refineries's capacity.

[54] USDA, ERS, *Sugar and Sweetener Yearbook Tables* (accessed various dates).

[55] USDA, ERS, *Sugar and Sweeteners Outlook*, December 14, 2010, 9. Data converted from short tons. In 2010, the sugar content of U.S. imports of all SCPs equaled about 35 percent of total U.S. imports of raw and refined sugar, while the sugar content of U.S. exports of all SCPs equaled about 349 percent of total U.S. exports of refined sugar.

[56] Calculated by USITC staff based on official statistics of the USDOC.

[57] The principal domestic policy elements include minimum prices (loan rates), a guaranteed 85-percent market share for U.S. producers, and a feedstock flexibility program to divert surplus sugar to ethanol production. A summary of major changes that occurred to the U.S. sugar program under the 2008 farm bill is available at USDA, ERS, "2008 Farm Bill Side-by-Side" (accessed February 16, 2011).

[58] Threshold prices are known as loan rates because when sugar prices drop below the threshold, U.S. sugar producers may take non-recourse loans from the Commodity Credit Corporation, using their sugar as collateral.

under U.S. FTAs.[59] WTO TRQs are based on minimum commitments and may be increased under certain circumstances, while sugar TRQs under FTAs are increased annually according to staging schedules set by each FTA.[60]

WTO Agreement on Agriculture TRQs

The United States maintains separate TRQs for raw cane sugar, refined sugar, certain SCPs, and blended sugar syrups, and an absolute quota for cocoa powder containing sugar under the WTO Agreement on Agriculture.[61] Imports within the quota are dutiable at relatively low in-quota tariff rates, while over-quota imports are subject to much higher duties. The majority of in-quota imports benefit from duty-free treatment under various FTAs or PTAs, mainly the GSP. Over-quota imports are also subject to automatic safeguards, which add extra duties to the over-quota tariff depending on the price level of imports or, if announced by the Secretary of Agriculture, on the quantity of imports.[62]

The raw cane sugar TRQ is allocated on a country-specific basis among designated sugar-exporting nations in proportion to their average market share of U.S. imports. Four suppliers were allocated about half of the total TRQ quantity and each of these suppliers filled their entire allotted amount in 2010 (table 2.9). Under Uruguay Round commitments, the United States is required to allocate at least 1.1 million mtrv annually. The raw sugar TRQ must be set at this minimum level at the beginning of each marketing year (October 1) and must not be increased before April 1 of the following year, except in emergencies.[63] The raw cane sugar TRQ was increased twice during MY2010, when the total raw cane sugar TRQ for MY2010 rose to 1.6 million mtrv.[64]

The refined sugar TRQ is administered with lower allocations than the raw cane sugar TRQ, but with fewer regulatory restrictions as well. For example, while the required minimum level of the global refined sugar TRQ is 22,000 mtrv annually, it is not restricted to this minimum on October 1. The refined sugar TRQ typically is set at a substantially higher level than the minimum. Moreover, the refined sugar TRQ is administered on a first-come, first-served basis, except for reserved annual allocations for Mexico and Canada.[65] A certain amount of the refined sugar TRQ—69,695 mtrv in MY2010—is reserved for specialty sugars.[66]

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[59] Sugar quotas were first established under the Jones-Costigan Act in 1934 largely in response to global competitive conditions and government support in other countries. The current TRQ structure was established on October 1, 1990, as a result of a GATT complaint by Australia. Suarez, "Origin of the U.S. Sugar Import Tariff-Rate Quota Shares," September 1997, 14; Proclamation No. 6179, C.F.R. 3 (1990 Compilation).

[60] Preferential treatment under the raw cane sugar and refined sugar TRQs were not provided in the FTA with Australia. In addition, in-quota imports of sugar benefit from duty-free treatment under the GSP, the Andean Trade Preference Act, and the Caribbean Basin Economic Recovery Act.

[61] The WTO TRQs for raw cane sugar, refined sugar, certain SCPs, and blended sugar syrups are all provided for in the additional U.S. notes 5, 7, 8, and 9 to chap. 17 of the HTS and pertinent subheadings. The WTO TRQ for cocoa powder containing sugar is provided for in additional U.S. note 1 of chap. 18 of the HTS. 15 C.F.R. (2011).

[62] The safeguards do not apply to imports from countries with U.S. FTAs. U.S. note 1 to chap. 99, subch. IV of the HTS.

[63] Emergencies include war, flood, hurricane, or other natural disaster, or other similar event as determined by the Secretary of Agriculture. 7 U.S.C. 1359kk. The current farm bill became effective beginning October 1, 2008.

[64] USDA, FAS, "USDA Announces Increase in Fiscal Year 2010 Raw Sugar Tariff-Rate Quota," 2010; 75 Fed. Reg. 38764 (July 6, 2010). Additional U.S. note 5 (a) (ii) of chap. 17 of the HTS and section 359(k) of the Agricultural Adjustment Act of 1938, as amended, provides the authority for the Secretary of Agriculture to increase the TRQ.

[65] Because of WTO commitments, Mexico still receives a refined sugar allocation (2,954 mt) despite its duty-free status under NAFTA. The Canadian allocation is 10,300 mt.

[66] Specialty sugars are defined in 15 CFR 2011.202(i).

TABLE 2.9 Sugar: TRQ fill rates, 2007–10

TRQ[a]	TRQ fill rates (%)				Imports	Allocation
	2007	2008	2009	2010	2010	2010
					Thousand mtrv	
Raw sugar	80.8	85.5	82.2	94.1	1,478,234	1,570,787
Australia	100.0	99.9	100.0	100.0	142,428	142,428
Brazil	100.0	100.0	98.4	100.0	248,822	248,822
Dominican Republic	100.0	100.0	95.5	100.0	253,830	253,830
Philippines	89.7	97.0	99.1	100.0	177,367	177,367
Other	70.1	71.4	65.9	87.6	655,787	748,340
Refined sugar	99.2[b]	99.7	90.9	96.7	87,085	90,039
Mexico[c]	34.0	([d])	([d])	([d])	732,164	([d])
Other FTA sugar[e]	100.0	99.2	96.7	95.6	107,183	112,157
CAFTA-DR	100.0	99.2	98.4	97.3	107,163	110,103
Peru[f]	([d])	([d])	0	0	0	2,000
Other	([d])	43.9	33.3	37.0	20	54

Source: USDA, FAS, *Sugar Monthly Import and Re-Export Data Report,* 2008–11; USDA, FAS, "Sugar under Tariff Rate Quotas," 2007; USDA, ERS, *Sugar and Sweetener Yearbook Tables* (accessed various dates); U.S. Customs, Customs Quota Branch, "Historical Tariff-Rate Quota/Fill Rate Levels."

[a]On an MY basis, unless otherwise indicated.
[b]USITC estimate.
[c]Imports unconstrained by TRQs since January 1, 2008. Fill rate for 2007 includes NAFTA and specialty sugar allocations.
[d]Not applicable.
[e]On a CY basis.
[f]Includes the 2,000 mtrv Peru specialty sugar TRQ in 2009 and 2010. Regular FTA TRQ allocation is zero, because Peru did not have a sugar trade surplus. The FTA with Peru entered into force on February 1, 2009.

FTA TRQs

The United States provides TRQs for sugar and SCPs under various FTAs. FTAs include additional market access for imported raw cane sugar, refined sugar, and SCPs, and the allocations increase annually for the quantities specified in each FTA. As noted above, imports from Mexico under NAFTA now enter duty free. Other than Mexico, CAFTA-DR countries have received the largest additional allocations among U.S. FTA partners. The CAFTA-DR countries received initial additional regional allocations totaling 109,000 mt. After a 15-year linear staging period, the additional regional allocations will total 153,140 mt.[67] These quantities could overstate the allocations actually received, however, because partner countries must be net exporters of sugar in order to receive additional TRQs. For example, the Dominican Republic, Peru, Chile, and Morocco are not currently net exporters, and therefore received no TRQ allocations in 2010.[68]

Projected Industry Trends, 2005–15

The baseline simulation projects modest growth in output of 10 percent or less in the U.S. sugar industry from 2005 to 2015. Total imports of sugar are expected to grow by about 25 percent over the same period, with most of that growth coming in the form of refined sugar. Employment in all sugar crops is anticipated to rise by about 5 percent. The world price of sugar has risen markedly since 2005, while domestic sugar prices have also risen, though to a lesser extent. The baseline projection incorporates this expectation. As a

[67] In future years, access will increase by 2,640 mt annually, in perpetuity.
[68] 74 Fed. Reg. 66718–66720 (December 16, 2009). Costa Rica did not receive its CAFTA-DR sugar quota until CY2011.

result, sugar TRQs and other domestic sugar policies raise import prices by only 12.2 percent in the projection, compared to 47.5 percent in the previous study.

Effects of Liberalization Relative to Projected Trends

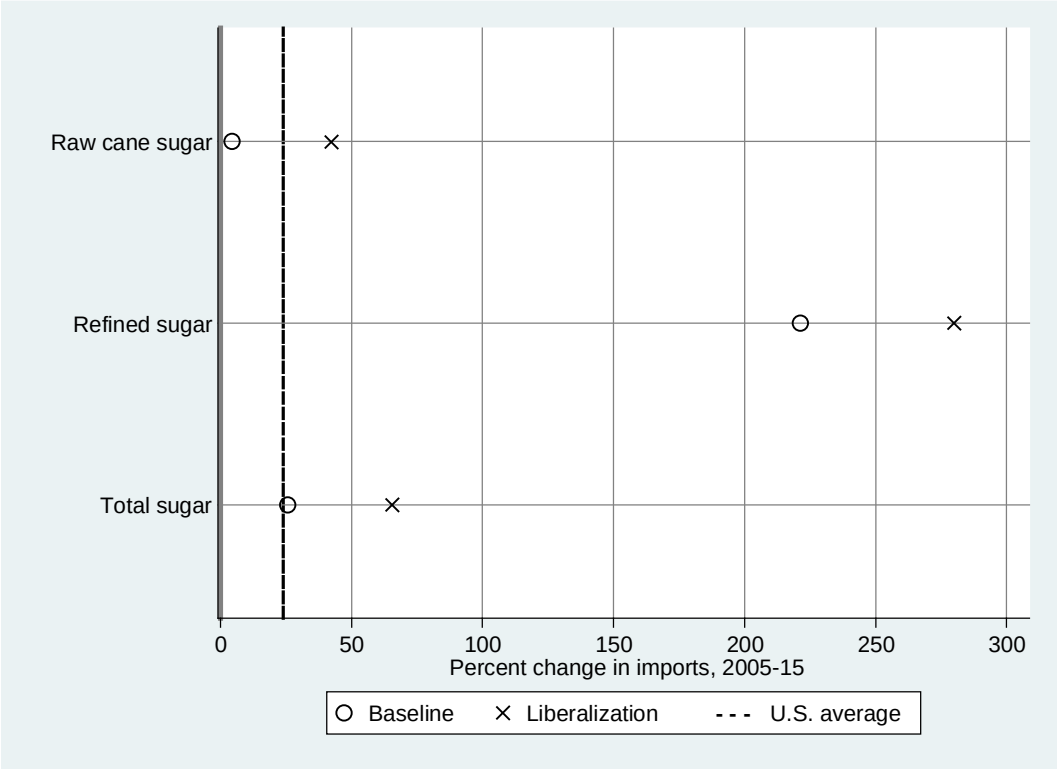
Removal of the restrictions on imports of sugar would result in an estimated increase in U.S. welfare of $49 million in 2015, compared to an increase of $514 million in 2013 in the previous report. The smaller welfare gain is driven by the downward revision in the degree to which TRQs and other domestic sugar policies are expected to raise the baseline price of imported sugar in 2015. Table 2.8, figures 2.8 and 2.9, and appendix table E.5 show the effects of liberalizing U.S. sugar import restrictions.

Liberalization consists of removing TRQs and eliminating the remaining within-quota tariffs. Under liberalization, the landed, duty-paid import price of raw cane sugar would decline by about 14 percent (appendix table E.5). As prices decline, demand for imported sugar is expected to expand by 36 percent for raw cane sugar and by lesser amounts for refined sugar. The increased competition from imports depresses domestic production of raw cane sugar by 8 percent and of refined beet sugar by 2 percent. Production of the feedstock crops, sugarcane and beets, similarly decline (appendix table E.5). Employment in sugar crops would decline by 2.8 percent as a result of liberalization, while employment in sugar processing would fall by somewhat less, 1.6 percent, owing to the rise in refining of imported raw sugar. Domestic production of refined cane sugar would rise by almost 3 percent because imported raw cane sugar is used as an input into domestic sugar refineries. Household prices of refined sugar would decline by 1 percent. Because of the reduced cost of sugar, production of SCPs would increase slightly (appendix table E.5).

Of the $49 million in welfare gain from liberalization of sugar restraints, $36 million is accounted for by increased household consumption of sugar and SCPs. The net effect of private consumption of all other goods and services contributes another $4 million to welfare, and the remaining $9 million is due to the rise in government expenditures.[69]

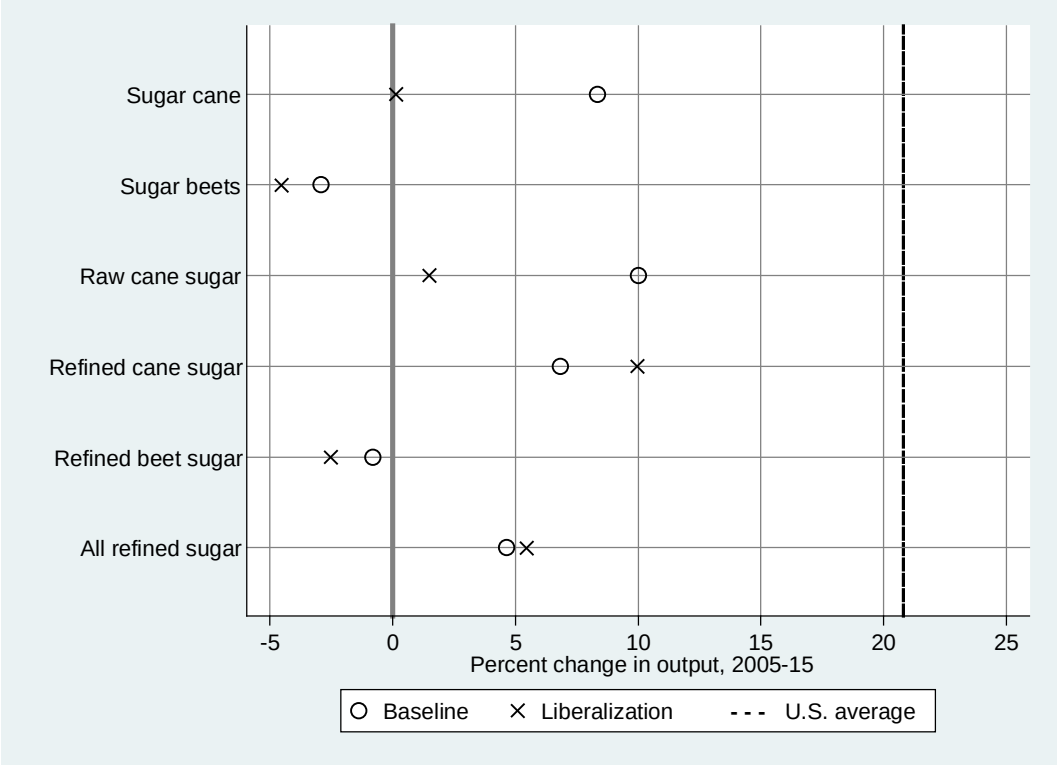
[69] In the model, the government receives a fixed portion of any income gains from liberalization, so both real private consumption and real government consumption expand. As with all welfare estimates in this report, the reported welfare gains are net of any declines in the liberalized sectors.

FIGURE 2.8 Percent change in imports of sugar, baseline projection and liberalization, 2005–15



Source: Commission estimates.

FIGURE 2.9 Percent change in output of sugar, baseline projection and liberalization, 2005–15



Source: Commission estimates.

Canned Tuna[70]

The United States is the world's third-largest canned tuna producer,[71] with shipments valued at an estimated $889 million in 2010 (table 2.10). It also represents the world's leading market for canned tuna, accounting for about 28 percent of global consumption.[72] The U.S. canned tuna industry, which includes production facilities in the continental United States, American Samoa, and Puerto Rico, has become increasingly concentrated over time, such that three major brands—Bumble Bee, StarKist, and Chicken of the Sea—accounted for about 80 percent of the market in 2010. Industry concentration has occurred largely in response to competitive stresses linked to significantly higher U.S. wage rates in fish processing compared with foreign competitors, such as Vietnam and Ecuador. As a result, U.S. production has fallen from about 300,000 mt in 2000 to about 200,000 mt in 2008.[73] Similarly, industry employment fell to about 10,000 workers in 2010, representing a significant loss of jobs compared with 30 years ago. As employment has declined, U.S. companies have become increasingly mechanized in order to achieve efficiency through scale economies.[74]

The United States is the world's largest canned tuna importer,[75] with imports of $660 million in 2010. Like domestically produced canned tuna, these imports are highly concentrated among a few major suppliers. In 2010, Thailand accounted for 58 percent of U.S. tuna imports, while the top five suppliers (Thailand, Ecuador, the Philippines, Vietnam, and Indonesia) together accounted for 95 percent. Imports made up 45 percent of estimated U.S. consumption in 2010, and exports accounted for 1 percent of domestic production.

The canned tuna sector comprises two principal products: tuna packed in oil and tuna packed in water. Production costs for tuna in oil and tuna in water are nearly identical; canneries can switch production from one product to the other at little cost. The two products generally have identical wholesale and retail prices (for any given brand and size of can or pouch). Tuna packed in water is by far the more popular product, accounting for about 85 percent of U.S. production and approximately 96 percent of total U.S imports.

Nature of Trade Restraints

Restrictions on tuna packed in oil are much higher than on tuna in water. Imports of canned tuna packed in oil are subject to a relatively high tariff of 35 percent, but are not subject to TRQs. U.S. imports of canned tuna packed in water are subject to a TRQ, but both the in-quota rate of 6 percent and the over-quota duty rate of 12.5 percent are below the 35 percent rate for tuna packed in oil.[76] The TRQ for any given calendar year is equal to 4.8 percent of apparent U.S. consumption (as reported annually by the USDOC) of

[70] Throughout this section, the term "canned tuna" refers to both canned and pouched tuna. In the U.S. HTS, both tuna in cans and tuna in pouches are referred to as "tuna in airtight containers."

[71] Makoto et al., "Recent Developments in the Tuna Industry," 2010, 93, 98.

[72] Bumble Bee Foods, LLC, written submission to the USITC, January 12, 2011, 2.

[73] Makoto et al., "Recent Developments in the Tuna Industry," 2010, figure 67, 108.

[74] Bumble Bee Foods, LLC, written submission to the USITC, January 12, 2011, 5.

[75] Makoto et al., "Recent Developments in the Tuna Industry," 2010, 93, 98.

[76] Quotas on canned tuna imports were first introduced in 1956. This was in response to sharply increasing imports of canned tuna (nearly all from Japan) beginning in the early 1950s. For example, between 1951 and 1956, imports of canned tuna increased from 13 million pounds to 44 million pounds, or equivalently from 6 percent of domestic consumption to 16 percent. U.S. Tariff Commission, *Tuna Fish*, 1958; USITC, *Competitive Conditions in the U.S. Tuna Industry*, 1982.

TABLE 2.10 Canned tuna: Summary data and simulation results

Item	Summary Data 2007	2008	2009	2010	Projected change, 2005–15 (%)	Effect of liberalization (%)
Employment	Employees					
Total canned tuna	10,050[a]	10,050[a]	10,000[a]	10,000[a]	68.1	–6.6
Shipments	Millions of $					
Total canned tuna	702	845	757	869[a]	15.3	–8.2
Tuna in oil	105[a]	127[a]	114[a]	113[a]	15.4	–8.9
Tuna in water	597[a]	718[a]	643[a]	756[a]	15.2	–8.1
Imports						
Total canned tuna	524	662	613	660	–2.0	19.9
Tuna in oil	17[a]	25[a]	28[a]	28[a]	14.0	52.1
Tuna in water	507[a]	637[a]	585[a]	632[a]	–2.7	18.5
Exports						
Total canned tuna	4	6	8	9	–66.3	12.9

Source: National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Fisheries of the United States; USITC DataWeb/USDOC; Commission estimates for projection and liberalization.

Note: Model sectors are determined by U.S. input-output classifications and may differ from summary data. Projected changes are based on quantity trends. Effects of liberalization represent deviations from the projected changes. See app. E for details and table E.6 for sector definitions.

[a]Commission estimate.

canned tuna during the immediately preceding year.[77] There is substantial demand for canned tuna in the United States, however, and as the over-quota tariff is not prohibitive, in 2009 over-quota imports amounted to 149,324 mt, representing 89 percent of total canned tuna imports.[78]

The TRQ is administered on a global first-come first-served basis. Because the low in-quota tariff rate is about one-half the over-quota rate, importers attempt to qualify for as large a share of the TRQ as possible by storing thousands of cases of canned tuna in customs-bonded warehouses in late December, waiting to withdraw those cases as soon as the calendar year begins.[79] As a result, the TRQ fills very rapidly. However, according to industry sources, this system is costly for importers because it raises storage costs and leads to uncertainty over whether an individual importer's product will face the in- or over-quota rate.

Projected Industry Trends, 2005–15

The baseline simulation projects modest growth in canned tuna production to 2015, with an annual growth rate of about 1 percent. Overall imports are expected to decline slightly over the same period; the industry produces almost exclusively for domestic consumption, with exports expected to remain low.

[77] For example, for calendar year 2010, the TRQ on canned tuna was 16,618,716 kilograms. 75 Fed. Reg. 22418 (April 28, 2010).

[78] USDOC et al., *Fisheries of the United States 2009*, September 2010, 53.

[79] Bumble Bee Foods, LLC, written submission to the USITC, January 12, 2011, 3.

Effects of Liberalization Relative to Projected Trends

The canned tuna TRQs were not explicitly specified in the modeling framework because in-quota levels are small compared to the total volume of U.S. imports and consumption, while over-quota imports are large. Instead, liberalization of U.S. canned tuna imports was modeled by removing the ad valorem tariff equivalents for both tuna packed in oil and tuna packed in water. In the 2015 projected baseline, the anticipated tariff equivalent rates are 16.3 percent for tuna packed in oil and 10.2 percent for tuna packed in water. Removing these tariff equivalents is estimated to increase U.S. welfare by $16 million. The removal of import restraints would affect tuna packed in oil more than tuna packed in water. The imported price of tuna packed in oil would decline by 16 percent (table E.5), and imports would rise by 52 percent; for tuna packed in water, the import price would fall by 9 percent and imports would rise by 19 percent (table 2.10, figures 2.10 and 2.11). Employment would fall by 7 percent in the canned fish industry, which also produces other canned fish and seafood. The estimated effects on related sectors are small, with a small negative effect on prepared fish (appendix table E.5).

Textiles and Apparel

The United States remains the world's largest importer of textiles and apparel,[80] accounting for about 25 percent of global imports by value in 2010. The U.S. recession between 2007 and 2009 exacerbated the contraction in the U.S. textile and apparel sector that has been underway since the late 1980s. Output of textiles and apparel fell 35.3 percent during 2007–09 to $62.7 billion before rebounding modestly by 5.9 percent to $66.4 billion in 2010 (table 2.11). Output of apparel was especially hard hit, falling 47.9 percent, with scant (1.3 percent) recovery in 2010. Employment in the textiles and apparel sector also declined dramatically, falling 27 percent in 2007–10, for a loss of 146,500 jobs. U.S. imports and exports fell by 16 and 18 percent, respectively, between 2007 and 2009, but began to rebound in 2010. As textile and apparel manufacturing companies have increasingly outsourced production to low-cost overseas producers,[81] the number of U.S. textile and apparel plants has declined, with a corresponding decrease in the number of textile and apparel workers. In 2009, there were 3,463 textile mills, down from 3,828 in 2007; 7,810 textile product mills, down from 8,130 in 2007; and 8,339 apparel firms, down from 9,492 in 2007.[82]

Despite this sharp contraction, industry representatives project that the rate of decline in the U.S. textile and apparel industry will slow through 2015 compared with 2005–10.[83] In part, this is because domestic products no longer compete directly with imports. The limited remaining domestic production of textile and apparel articles is primarily for U.S. government defense contracts under the Berry Amendment;[84] for high-end and niche

[80] Textiles and textile articles include yarn, thread, fabric, household furnishings (carpets, rugs, home linens, canvas products, rope, twine, and tire cord), and other miscellaneous made-up articles. Apparel articles include knit, knit-to-shape, and woven garments.

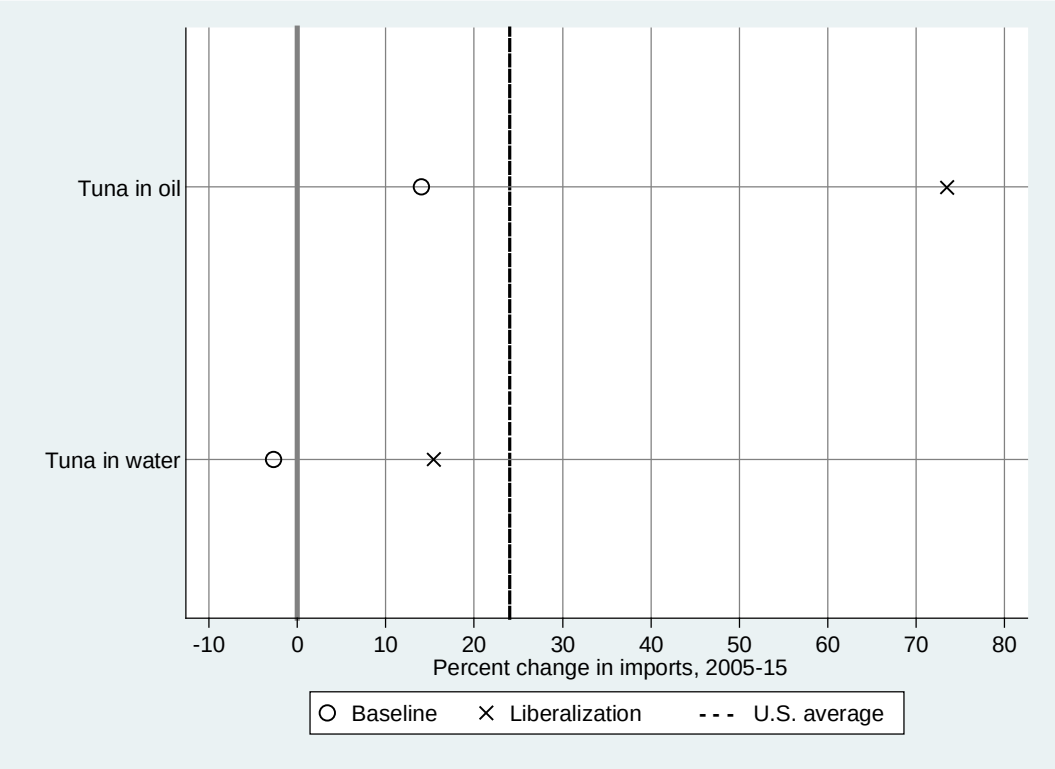
[81] Panteva, "Textile Mills in the U.S.," 2010, 5.

[82] USDOL, BLS, *Quarterly Census of Employment and Wages* (accessed March 14, 2011). Textile mills are included in NAICS 313; firms that produce textile mill products are in NAICS 314; and apparel firms are included in NAICS 315.

[83] Panteva, "Textile Mills in the U.S.," 2010, 3; Reichard, "Textiles 2011," 2011, 26.

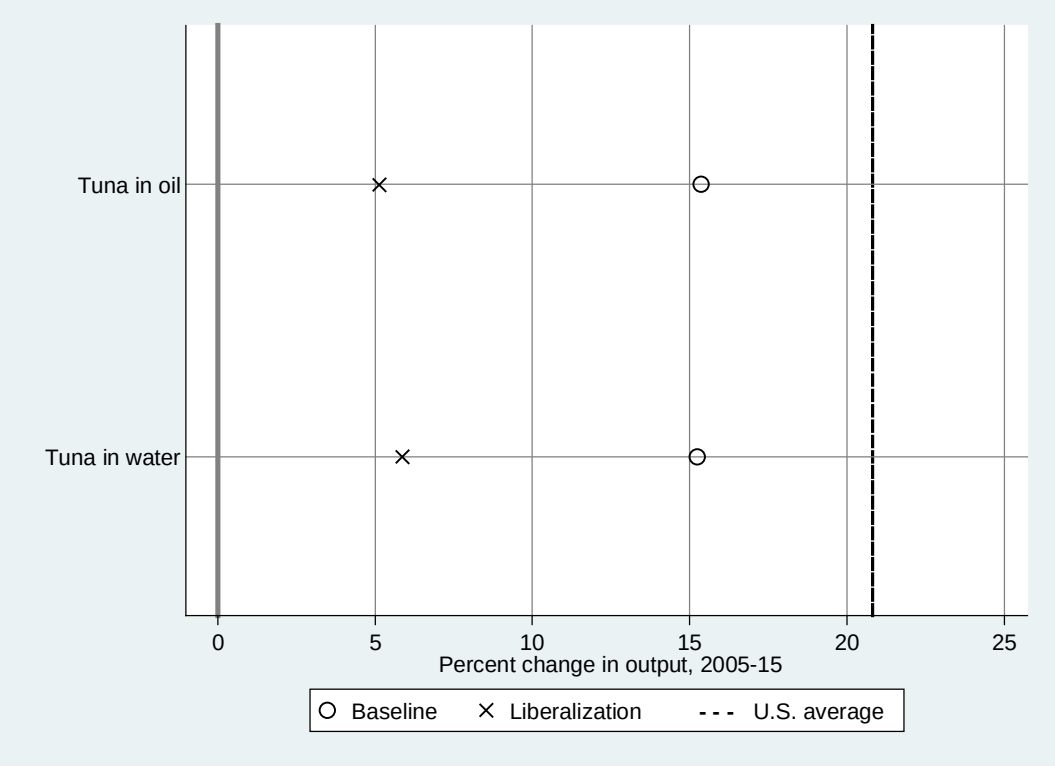
[84] The Berry Amendment requires that clothing or textile articles procured by the U.S. Department of Defense (USDOD) be produced in the United States, including the fibers, yarn, and fabric used to construct such articles (10 U.S.C. 2533a). For further information on the Berry Amendment, see USDOD, "Berry Amendment FAQ" (accessed June 13, 2011).

FIGURE 2.10 Percent change in imports of canned tuna, baseline projection and liberalization, 2005–15



Source: Commission estimates.

FIGURE 2.11 Percent change in output of canned tuna, baseline projection and liberalization, 2005–15



Source: Commission estimates.

TABLE 2.11 Textiles and apparel: Summary data and simulation results

Item	Summary Data 2007	2008	2009	2010	Projected change, 2005–15 (%)	Effect of liberalization (%)
Employment	Thousands of employees					
All textiles and apparel	542	497	418	396	–51.8	–8.9
Textile mills[a]	170	151	124	119	–61.7	–9.2
Textile products[b]	158	147	126	119	–39.5	–4.4
Apparel[c]	215	199	168	158	–56.2	–15.8
Shipments	Millions of $					
All textiles and apparel	96,888	91,501	62,675	66,401	–39.7	–9.8
Yarn, thread, and fabric	36,587	33,554	25,380	28,289	–49.3	–8.6
Textile products	30,487	26,780	21,774	22,382	–25.8	–4.8
Apparel	29,814	31,167	15,521	15,730	–32.0	–15.8
Imports						
All textiles and apparel	101,830	98,107	85,337	97,760	9.6	2.0
Yarn, thread, and fabric	7,456	6,943	5,287	6,524	–23.5	–1.6
Textile products	15,412	14,985	13,229	15,824	15.2	1.4
Apparel	78,962	76,179	66,821	75,412	13.3	2.2
Exports						
All textiles and apparel	13,994	13,880	11,509	13,471	–23.9	–51.7
Yarn, thread, and fabric	8,242	8,209	6,431	7,822	–27.9	–30.3
Textile products	2,628	2,600	2,267	2,583	–16.3	–46.0
Apparel	3,124	3,071	2,811	3,066	–19.5	–88.6

Sources: USITC DataWeb/USDOC; USDOC, Census, *Annual Survey of Manufactures* (accessed March 22, 2011); USDOL, BLS, *Quarterly Census of Employment and Wages* (accessed March 22, 2011); Commission estimates for projection and liberalization.

Note: Model sectors are determined by U.S. input-output classifications and may differ from summary data. Projected changes are based on quantity trends. Effects of liberalization represent deviations from the projected changes. See app. E for details and table E.6 for sector definitions.

[a]Textile mills primarily produce yarn, thread, and fabric.
[b]Textile products include carpets, rugs, home linens, canvas products, rope, twine, tire cord, and other miscellaneous made-up textile articles.
[c]Apparel includes knit, knit-to-shape, and woven garments and hosiery.

markets willing to pay a premium price for higher quality, a more advanced product, and faster turnaround; and for medical and industrial protection purposes requiring specialized materials such as nonwoven, flame-resistant fabrics—products that low-cost countries are unable to manufacture because they lack the requisite advanced technologies.[85]

In 2010, 85.6 percent of the total value of all apparel sold in the United States was imported, up from 74.7 percent in 2007. Since the elimination of global textile and

[85] Panteva, "Textile Mills in the U.S.," 2010, 4, 8.

apparel import quotas in 2005,[86] global textile and apparel production has become concentrated among a small group of lower-cost Asian suppliers, particularly China.

Between 2007 and 2010, U.S. imports of textiles and apparel from China increased 16.0 percent to $40.5 billion, while imports from Vietnam rose 37.0 percent to $6.1 billion and imports from Bangladesh grew by 27.5 percent to $4.1 billion. Although China is the leading supplier, its growth in the U.S. market has slowed in recent years because rising material and labor costs have boosted the price of Chinese-produced apparel, making it less competitive with other low-cost suppliers.[87]

Nature of Trade Restraints

There are no remaining quantitative restrictions on textile and apparel imports. However, U.S. tariffs on textiles and apparel remain high: the trade-weighted average ad valorem tariff on all U.S. imports of textiles and apparel was 11.1 percent in 2010. In general, tariffs on textiles and apparel increase with each stage of manufacturing—that is, the duty rates are usually higher on apparel than on yarn or fabric.[88] In 2010, the trade-weighted average tariff on apparel was 12.6 percent, compared with 6.2 percent for textile products and 5.1 percent for textile mill articles (mainly yarns and fabrics).[89] In addition, tariffs on many heavily traded apparel articles are much higher than the overall average cited above, particularly for articles produced with man-made fibers. For example, the 2010 NTR duty rates on certain women's and girls' woven man-made fiber pants and blouses were 28.6 percent and 26.9 percent respectively, and those on men's swimwear of man-made fibers were 27.8 percent.[90] U.S. apparel industry representatives claim that such tariffs have a disproportionate impact on low-income consumers.[91]

FTAs, Preference Programs, and Rules of Origin

Certain U.S. imports of textiles and apparel are eligible for duty-free treatment under FTAs and PTAs. The value of U.S. textile and apparel imports that entered duty-free under FTAs or preference programs in 2010 was $20.4 billion, or 20.1 percent of total imports of such goods, with over half (56 percent) of such imports originating from CAFTA-DR countries and NAFTA partners. In general, for apparel to qualify for duty-free entry under the ROO requirements in U.S. FTAs or preference programs, it must be made from U.S. or regional inputs (yarns and fabrics); the specific percentages and other requirements vary by program.[92] According to industry representatives, compliance and paperwork associated with the ROO raise costs and may discourage companies from taking full advantage of the trade benefits offered under these programs and

[86] Quotas were originally imposed on textile and apparel imports to prevent market disruption as part of the 1974 Multifiber Arrangement (MFA), an agreement reached among most of the major textile exporting and importing countries. In 1995, the WTO Agreement on Textiles and Clothing replaced the MFA and established a 10-year phase-out of textile and apparel quotas that ended on January 1, 2005. For additional information, see USITC, *Import Restraints, Fifth and Sixth Updates*, 2007 and 2009; and USITC, *U.S. Imports of Textiles and Apparel under the Multifiber Arrangement*, 1991.

[87] Bruemmer, "Chinese Apparel Manufacturers Strive to Maintain Global Competitiveness," 2011.

[88] This is often referred to as tariff escalation.

[89] These average tariffs were calculated using NAICS nomenclature. Under NAICS, textile mill articles include intermediate inputs (e.g., yarn and fabric), and textile products consist of made-up textile articles such as carpets and rugs as well as towels, bedding, and other house furnishings. See table E.6 for additional information on the NAICS categories related to textiles and apparel.

[90] Nearly all U.S. trading partners have permanent NTR status.

[91] American Apparel and Footwear Association, written submission to the USITC, February 7, 2011, 2.

[92] USITC, hearing transcript, December 16, 2010, 63, 119 (testimony of Julia Hughes, president, on behalf of United States Association of Importers of Textiles and Apparel [USA-ITA]).

agreements.[93] Nonetheless, these ROO generate a large share of the export demand for U.S. textile and apparel inputs.

Projected Industry Trends, 2005–15

The baseline simulation projects a 40 percent decline in U.S. output of textiles and apparel between 2005 and 2015. Domestic employment is projected to decline by an even steeper 52 percent. Exports are also expected to contract in almost all sectors, with an average decline of 24 percent. The projected change in imports varies across the three product categories. Imports of apparel are projected to rise modestly between 2005 and 2015.[94] Imports of textile products also rise in the projection, while those of intermediate textile products fall substantially, reflecting declining demand for both domestic and imported inputs by U.S. manufacturers of downstream products. Overall household demand for apparel is estimated to rise by 25 percent over the 10-year period.

Effects of Liberalization Relative to Projected Trends

The removal of these trade restraints in this sector would increase overall U.S. welfare in 2015 by $514 million, compared to $2,254 million in the previous report. Liberalization consists of removing all tariffs and ROO requirements on the subject goods. The removal of ROO reduces demand for U.S. exports of items that currently benefit from such requirements. The size of the reduction in each sector depends on the amount of textile and apparel inputs that the United States exports to preferential trading partners that is subsequently exported back to the United States in finished apparel.[95]

Welfare gains from removing tariffs would total $909 million, but the contraction in demand for U.S. exports by countries whose trade preferences would be eliminated would reduce welfare by $395 million. The overall increase in welfare is substantially lower than estimated in the last update of this report, and is principally due to the elimination of quantitative restrictions on certain imports from China and Vietnam that occurred in 2008.[96]

The effect of liberalization in each sector depends on the relative importance of tariff removal and ROO elimination. Sectors experiencing the largest tariff liberalizations generally have the largest increases in imports, while sectors most affected by ROO have the largest declines in exports. Output declines are driven by both tariffs and ROO liberalization. In the seven sectors where ROO-based preferences are a relatively minor factor or not a factor at all, the estimated changes from the policy liberalization are small,

[93] USITC, hearing transcript, December 16, 2010, 118 (testimony of Julia Hughes, president, on behalf of USA-ITA); USA-ITA, written submission to the USITC, February 7, 2011.

[94] The projected rise in imports of apparel excluding hosiery represents an annual growth rate of 1 percent and is consistent with a 3 percent annual growth rate from 2010 to 2015, following the observed 3.4 percent import decline in quantity between 2005 and 2010. The broad apparel sector reported in table 2.11 also includes women's hosiery and hosiery n.e.c., imports of which have expanded substantially. See chap. 1 and app. E for details on construction of the projection.

[95] A more complete discussion of the approach used can be found in Fox et al., "Textile and Apparel Barriers and Rules of Origin," 2008.

[96] For a discussion of the quantitative restraints on Chinese and Vietnamese imports, see USITC, *Import Restraints, Fifth Update*, 2007, 67–70. For their expiration in 2008, see USITC, *Import Restraints, Sixth Update*, 2009, 41–44.

relative to the projected changes based on industry trends.[97] However, liberalization would sharply reduce exports in the 15 sectors in which domestic production is encouraged by U.S. preference programs and FTAs, since foreign demand would decline for those goods.[98] Although all 15 of these sectors show large estimated declines in exports, the effect of liberalization on production varies and depends primarily on the export orientation of the sector (figures 2.12–2.13 and appendix table E.5). The estimated decline in employment for these sectors generally mirrors the decline in output.

Other Sectors with Significant Import Restraints

Despite the low average U.S. tariff rate, the sectors discussed in this section remain subject to relatively high tariffs (table 1.2).[99] The largest such sector is the glass and glass products sector, in terms of both U.S. production value and employment in 2009; by these measures, the smallest sector is costume jewelry (table 2.12).

Projected Industry Trends, 2005–15

Although there is a great deal of variation, shipments for most of the sectors treated here were projected to grow at rates higher than the growth in U.S. GDP from 2005 to 2015, with footwear and leather products growing the most rapidly at 57 percent, and costume jewelry the least rapidly at 13 percent. The average projected growth in shipments for these sectors is 25 percent, compared to projected GDP of 20.8 percent.

Export growth rates for many members of this group vary widely from the projected national average growth in exports of 59 percent; the group's growth rates are projected to vary from 19 percent (writing instruments) to 92 percent (footwear and leather products). The projected change in imports varies from a decline of 19 percent for pesticides to a 37 percent increase for writing instruments, compared to a projected average growth rate of 24 percent in overall U.S. imports.

Effects of Liberalization Relative to Projected Trends

The effect of liberalizing imports in these sectors is modeled by removing tariffs, one sector (or group) at a time. Simulation results show that eliminating tariffs in these sectors would decrease the price of imported goods, increase imports, and generally reduce production and employment in the domestic industry, leading to a net welfare gain in almost all sectors (table 2.12, figures 2.14–2.17**,** and appendix table E.5).

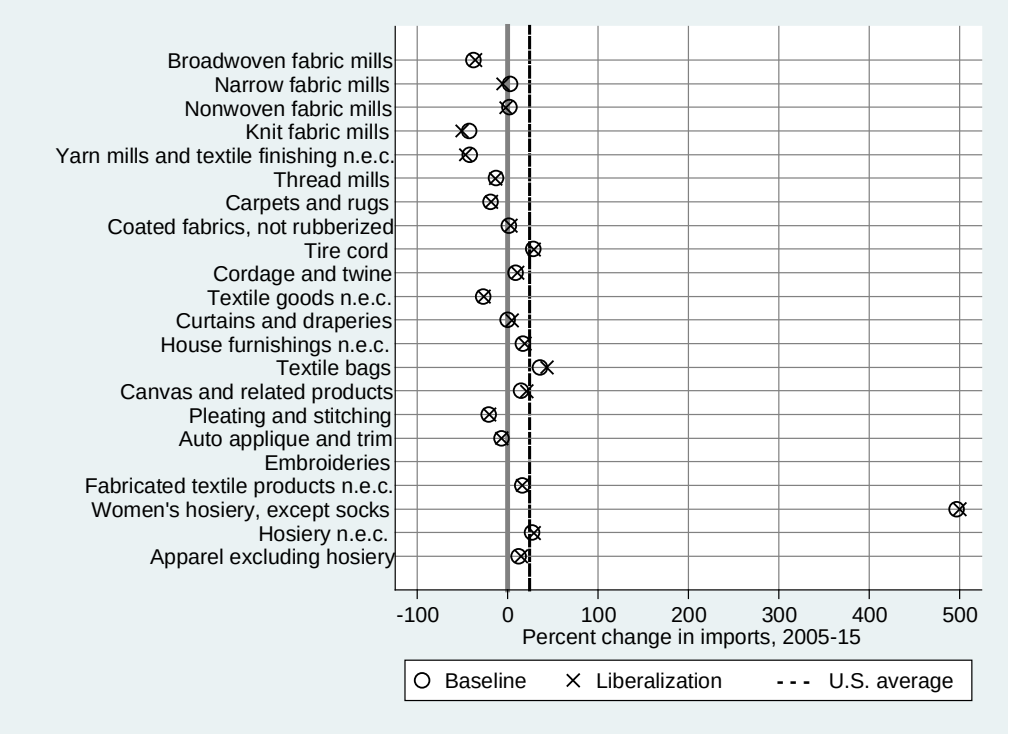
The sectors experiencing the largest welfare effects were in the footwear and leather products group; the welfare gain attributable to tariff elimination for this group was $215

[97] These sectors are nonwoven fabric, carpets and rugs, coated fabric, textiles goods, curtains, canvas products, and embroideries. Exports in these sectors are anticipated to decline by less than 10 percent in the case of removal of ROO requirements only.

[98] These 15 sectors include broadwoven fabric, narrow fabric, knit fabric, yarn, thread, tire cord, cordage, house furnishings, textile bags, pleating, automotive and apparel trimmings, fabricated textile products, women's hosiery, hosiery n.e.c., and apparel.

[99] As noted in chap. 1, two other sectors (motorcycles, bicycles, and parts; and watches, clocks, and parts) were also identified as having significant restraints based on their 2010 tariff rates. Liberalization of these sectors was estimated to have a small effect on U.S. welfare (less than $17 million combined). However, the model does not adequately distinguish between the parts and the finished goods in these sectors. Because tariff changes on intermediate goods can have very different implications from tariff changes on final goods, this report does not give detailed results for these two sectors.

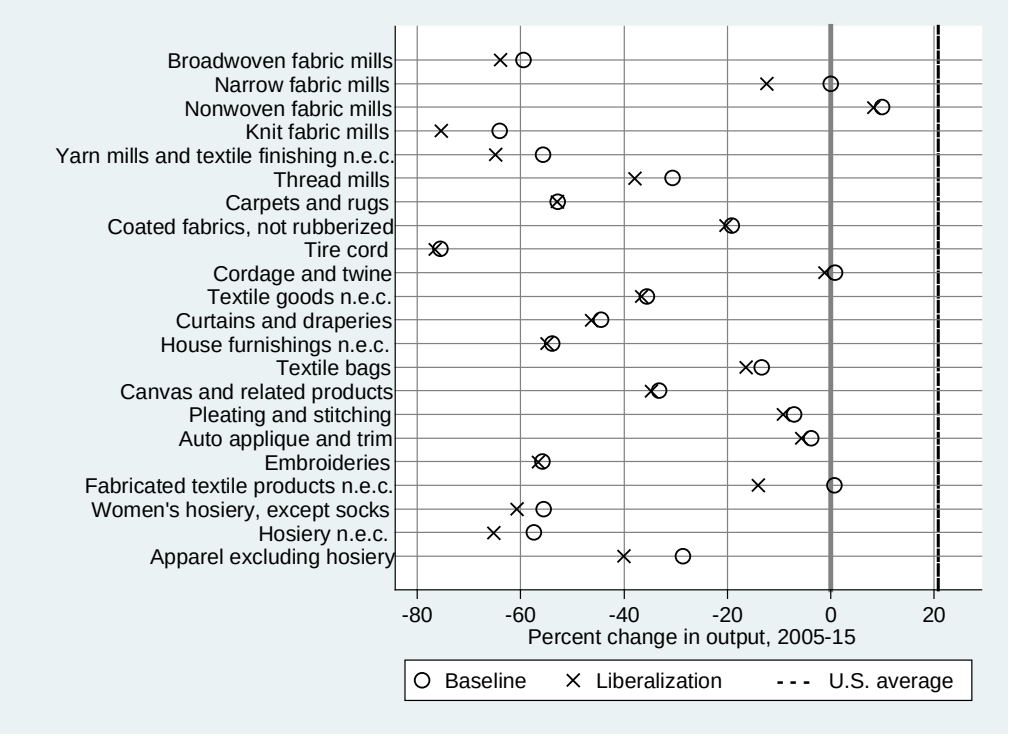
FIGURE 2.12 Percent change in imports of textiles and apparel, baseline projection and liberalization, 2005–15



Source: Commission estimates.

Note: n.e.c. means "not elsewhere classified."

FIGURE 2.13 Percent change in output of textiles and apparel, baseline projection and liberalization, 2005–15



Source: Commission estimates.

Note: n.e.c. means "not elsewhere classified."

TABLE 2.12 Sectors with significant tariffs: Summary data and simulation results

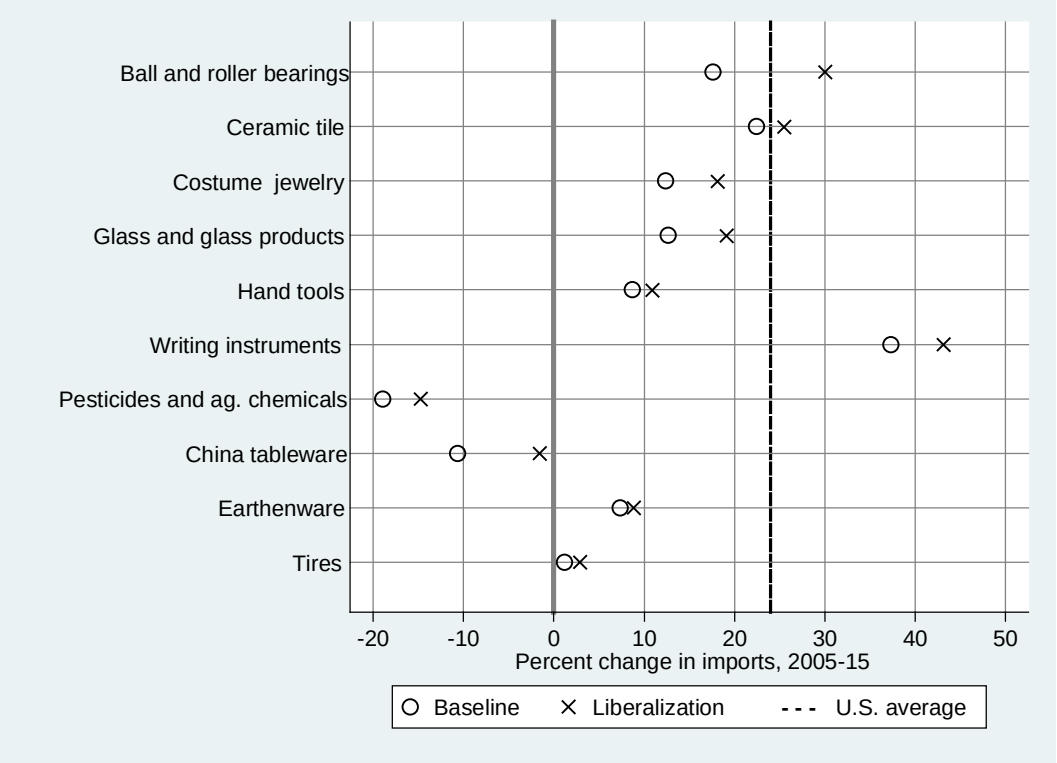
Item	Summary data 2009	Projected change, 2005–15 (%)	Effect of liberalization (%)
Employment	Employees		
Ball and roller bearings	21,004	13.3	–3.8
Costume jewelry	817[a]	–9.7	–2.3
Footwear and leather products	24,622	29.0	–1.7
Glass and glass products	80,784	11.5	–0.1
Hand tools	36,387[a]	5.5	–0.2
Writing instruments	2,373[a]	9.2	–1.7
Pesticides and agricultural chemicals	9,422	8.3	(+)
China tableware	5,711	6.3	–4.0
Ceramic tile	4,123	5.5	–4.4
Tires	50,849	10.6	–0.4
Shipments	Millions of $		
Ball and roller bearings	5,296	31.4	–3.8
Costume jewelry	207[a]	12.9	–2.3
Footwear and leather products	3,084	56.9	–1.7
Glass and glass products	18,612	26.5	–0.1
Hand tools	7,076[a]	23.3	–0.2
Writing instruments	552[a]	32.3	–1.6
Pesticides and agricultural chemicals	10,935	15.6	–0.1
China tableware	539	28.0	–4.0
Ceramic tile	827	23.5	–4.4
Tires	14,573	22.2	–0.4
Imports			
Ball and roller bearings	1,596	17.6	10.5
Costume jewelry	1,576	12.4	5.1
Footwear and leather products	24,261	22.1	3.9
Glass and glass products	4,211	12.6	5.7
Hand tools	2,074	8.7	2.0
Writing instruments	787	37.3	4.2
Pesticides and agricultural chemicals	743	–19.0	5.2
China tableware	1,498	0.9	4.1
Ceramic tile	964	22.4	2.4
Tires	8,108	1.2	1.6
Exports			
Ball and roller bearings	1,371	87.1	0.7
Costume jewelry	167	59.6	1.0
Footwear and leather products	1,153	91.5	0.3
Glass and glass products	3,715	77.4	3.4
Hand tools	1,226	64.2	0.1
Writing instruments	99	19.4	1.4
Pesticides and agricultural chemicals	2,205	66.4	0.9
China tableware	455	54.4	0.4
Ceramic tile	39	72.9	0.5
Tires	3,619	52.7	0.1

Source: USITC DataWeb/USDOC data; USDOC, Census, *Annual Survey of Manufactures 2009* (accessed February 25, 2011); Commission estimates for projection and liberalization.

Notes: Model sectors are determined by U.S. input-output classifications and may differ from summary data. Projected changes are based on quantity trends. Effects of liberalization represent deviations from the projected changes. See app. E for details and table E.6 for sector definitions. The (+) denotes a small positive value of less than 0.05 percent.

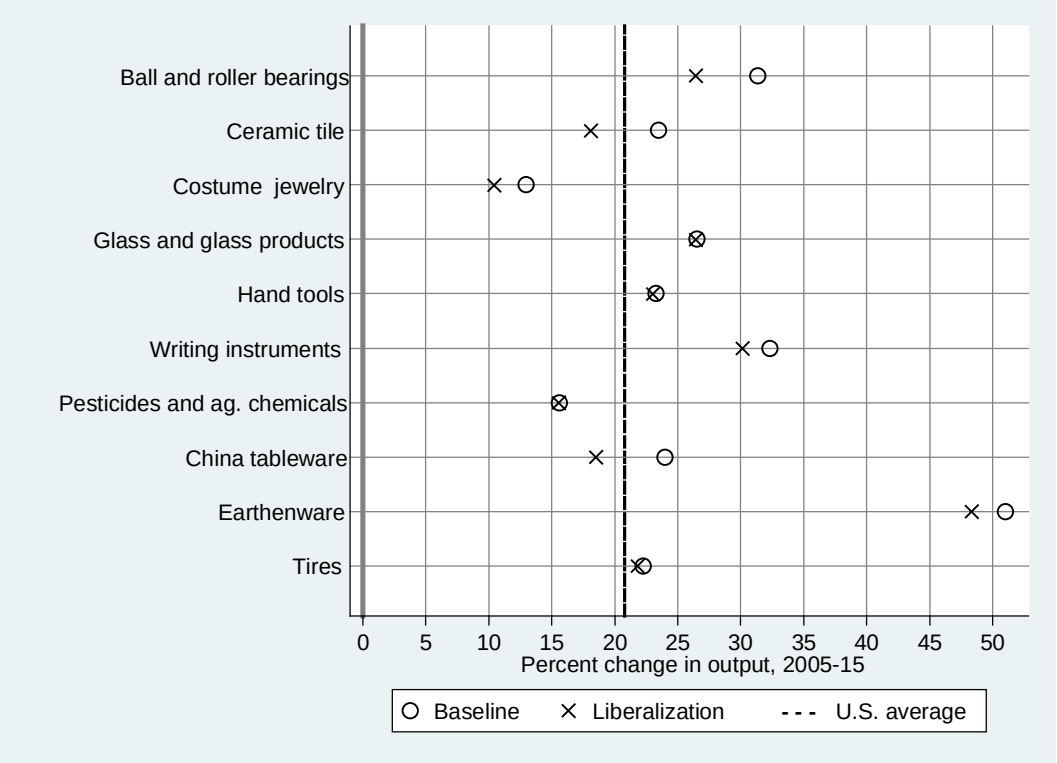
[a]Commission estimate.

FIGURE 2.14 Percent change in imports of high-tariff sectors, baseline projection and liberalization, 2005–15



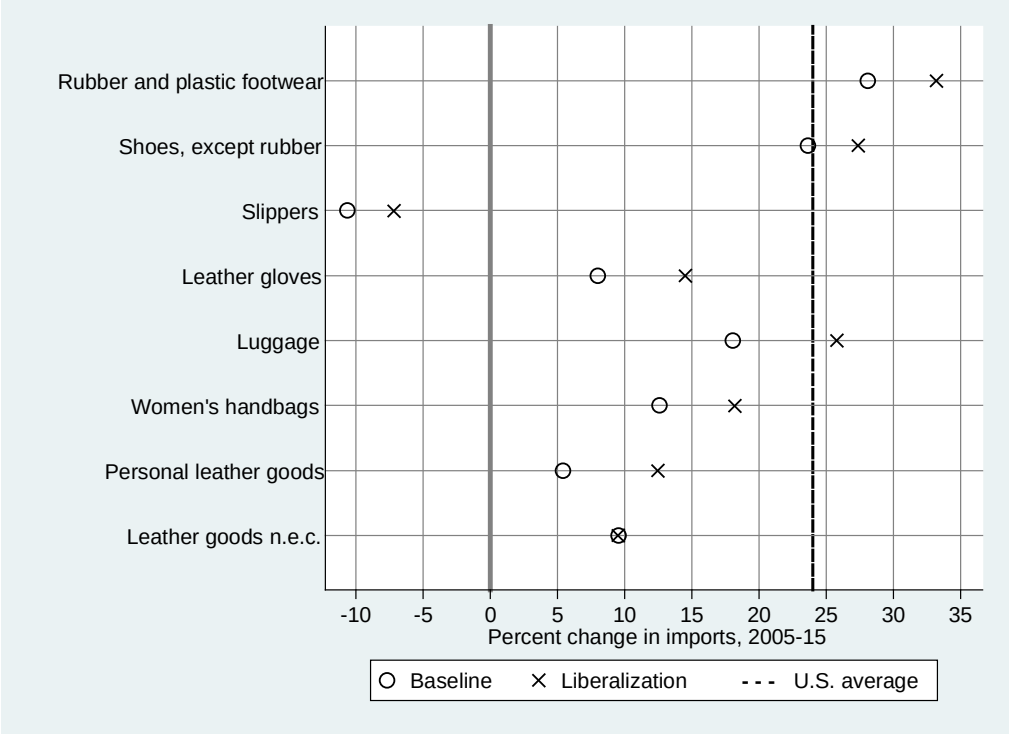
Source: Commission estimates.

FIGURE 2.15 Percent change in output of high-tariff sectors, baseline projection and liberalization, 2005–15



Source: Commission estimates.

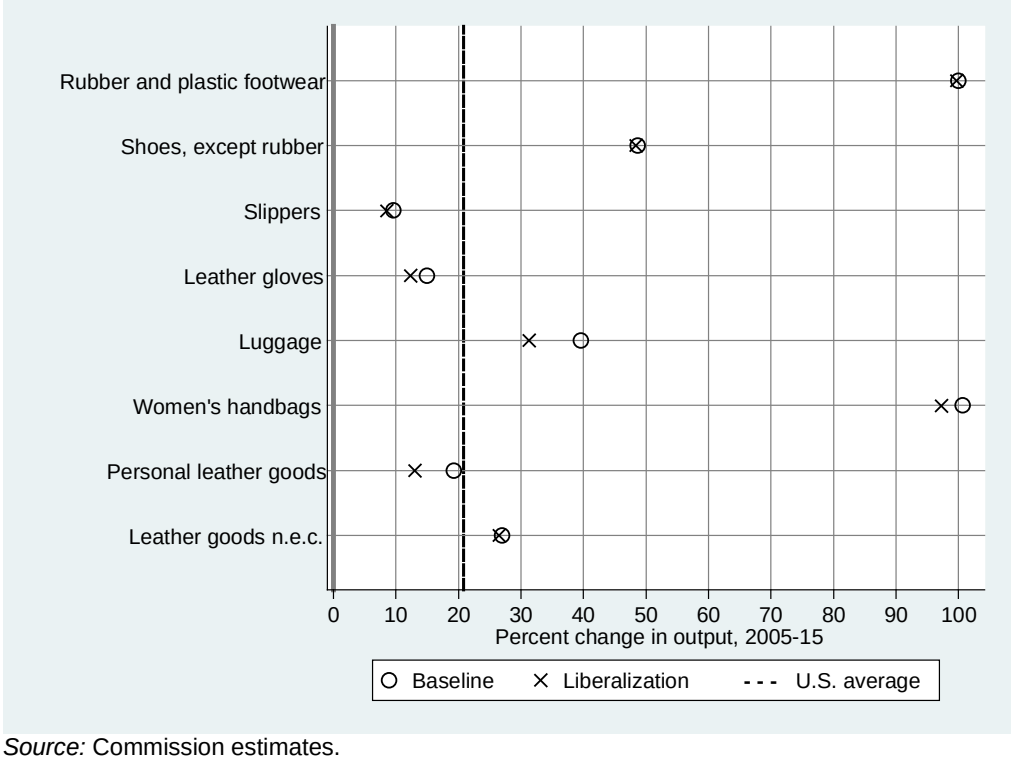
FIGURE 2.16 Percent change in imports of footwear and leather products, baseline projection and liberalization, 2005–15



Source: Commission estimates.

Note: n.e.c. means "not elsewhere classified."

FIGURE 2.17 Percent change in output of footwear and leather products, baseline projection and liberalization, 2005–15



Source: Commission estimates.

Note: n.e.c. means "not elsewhere classified."

million. Although eliminating tariffs has a minimal effect on leather goods not elsewhere classified (n.e.c.), eliminating tariffs on all other footwear and leather products reduces import prices by 8 to 11 percent; the greatest output declines for products in this group are in luggage, which declines by 6 percent from the projected 2015 baseline, and personal leather goods n.e.c., which declines by about 5 percent. Employment for these two sectors declines by similar amounts, while average output across the footwear and leather products group declines by about 2 percent and average imports rise by 4 percent.

For most other sectors the price of imports decline, output and employment in the domestic industry fall, and there is a net welfare gain. For pesticides and glass and glass products, however, the declines in output and employment outweigh the benefits of reduced import prices to produce a small net welfare loss of $3 million and $1 million, respectively.

Services Import Restraints

The United States is the leading global consumer of services supplied by foreign firms, which are attracted by both the large size and relative openness of the U.S. services market. Although the United States is largely open to the imports of services from other countries,[100] U.S. services import restrictions do impact certain industries. Such restrictions, which typically stem from federal and state regulations, chiefly affect the services delivered by the domestic subsidiaries of foreign multinational corporations rather than cross-border services flows.

Although this section presents information on notable U.S. barriers to services trade—drawn heavily from reports published by the WTO and the EU[101] (table 2.13)—no attempt has been made to quantify or model the barriers' impact. Over the past decade, several international bodies, including the Organisation for Economic Co-operation and Development (OECD) and the World Bank, as well as the Commission, have initiated programs to quantify the effects of services barriers in specific industries, but to date have reported relatively few results of the analyses for the United States. As analytical approaches to measuring the restrictiveness of specific services barriers mature, future updates of this report may present quantitative assessments of those barriers.

Current Conditions

Service industries represent a very large share of both production and employment in the United States. In 2009, for example, the U.S services market totaled $11.6 trillion, or about 82 percent of total U.S. gross domestic product; the number of employees working in the U.S. services sector in that year totaled approximately 103 million, or 84 percent of all employees in the United States.[102]

The United States is the world's single largest cross-border importer and exporter of services, accounting for 14 percent of global services exports and 11 percent of imports in 2009, the most recent year for which such data are available. The United States also recorded the world's largest services trade surplus.[103] In 2010, U.S. exports of private sector services totaled approximately $527 billion, whereas U.S. imports totaled $359 billion, resulting in a services trade surplus of $168 billion (table 2.14). In 2009, the most recent year for which industry-level data are available, business, professional, and technical services represented 24 percent of both U.S. imports and exports of services, the single largest share in both categories.

[100] The United States is the sixth most open country for services trade out of 147 countries ranked according to the General Agreement on Trade in Services (GATS) Commitments Restrictiveness Index. WTO, World Trade Indicators 2009/10 database (accessed March 16, 2011).

[101] WTO, *Trade Policy Review*, 2010; European Commission, *United States Barriers to Trade and Investment Report for 2008*, 2009.

[102] USDOC, BEA, "Gross Domestic Product (GDP) by Industry Data," accessed July 20, 2011. These values and shares include both government and private services-producing industries. Employment is based on full-time equivalent employees. 2009 is the latest year for which services employment data are available.

[103] WTO, *International Trade Statistics 2010*, 2010, 15. There are slight discrepancies between BEA and WTO trade data, the latter of which is sourced from the International Monetary Fund; the discrepancies stem largely from the use of different classification systems. For example, in 2009, the WTO recorded U.S. imports of services as $331 billion, whereas BEA recorded imports as $335 billion. In that same year, the WTO reported U.S. services exports of $474 billion, whereas the BEA reported $484 billion.

TABLE 2.13 Significant restrictions on U.S. services imports by sector

Broad sector	Establishment restrictions	Foreign-equity restrictions	State-level regulations
Air transport	☒	☒	☐
Marine transport	☒	☒	☐
Communication services	☐	☒	☐
Insurance services	☐	☐	☒
Legal services	☐	☐	☒

Sources: American Bar Association; European Commission; National Association of Insurance Commissioners; National Conference of Bar Examiners; United States Code; Code of Federal Regulations; and the WTO.

TABLE 2.14 Trade in U.S. private service industries, 2007–10 (billions of dollars)

Item	2007	2008	2009	2010
Exports				
Total export trade	469.9	517.9	483.9	526.6
Business, professional, and technical	103.8	115.2	116.6	([a])
Travel	96.9	110.0	93.9	103.1
Royalties & license fees	84.6	93.9	89.8	95.8
Financial services	61.0	60.8	55.4	([a])
Other transportation[b]	40.3	43.7	35.4	39.8
All other	83.3	94.3	92.7	287.9[c]
Imports				
Total import trade	335.1	365.5	334.9	358.6
Business, professional, and technical	70.4	82.5	82.0	([a])
Travel	76.3	79.7	73.2	74.6
Insurance services	47.5	56.1	55.2	([a])
Other transportation[b]	53.5	53.7	41.6	49.0
Passenger fares	28.4	32.6	26.0	28.1
All other	58.9	60.8	56.9	206.9[c]
Trade balance	134.8	152.5	149.0	168.0

Sources: USDOC, BEA, *U.S. International Services database*, "Table 1," 1986–2009; USDOC et al., *U.S. International Trade in Goods and Services, January 2011*, "Exhibits 3 and 4," March 10, 2011.

Note: Details are provided for the five service industries with the largest imports or exports in 2009. Individual entries may not sum to totals due to rounding.

[a]Not available.
[b]Includes freight and port services.
[c]Trade data not available by industry in 2010 are included in the "all other" aggregation.

In addition to cross-border flows, international trade in services also occurs when U.S. and foreign companies sell services through foreign affiliates abroad. Services supplied abroad by U.S.-owned foreign affiliates were valued at $1.1 trillion in 2008, whereas services supplied by foreign-owned affiliates in the United States totaled $727.4 billion (table 2.15). [104] Wholesale trade represented the largest share of U.S. affiliate trade in 2008, accounting for 21 percent of U.S. affiliates' sales abroad and 23 percent of the sales of foreign affiliates in the United States (table 2.15).

[104] U.S.-owned foreign affiliates are subsidiary companies owned by a U.S.-parent company and located abroad. Conversely, foreign-owned U.S. affiliates are owned by foreign parent companies and located in the United States.

TABLE 2.15 Sales and purchases by multinational corporations (MNCs) in U.S. private service industries, 2006–08 (billions of dollars)

Item	2006	2007	2008
Sales by U.S. MNCs abroad[a]			
Total sales	889.8	1,019.2	1,136.9
Wholesale trade	179.2	214.2	234.8
Financial services	145.9	160.2	175.9
Insurance services	47.6	55.3	65.3
Retail trade	53.4	58.6	63.3
Real estate and rental and leasing	31.9	42.8	48.5
All other	431.8	488.1	549.0
Sales by foreign MNCs in the United States			
Total purchases	648.3	683.8	727.4
Wholesale trade	151.4	156.8	163.9
Financial services	82.5	90.6	96.7
Professional, scientific, and technical services	56.2	63.0	70.3
Transportation and warehousing	42.9	42.9	48.5
Insurance services	42.1	44.4	47.7
All other	273.2	286.2	300.3

Sources: USDOC, BEA, *U.S. International Services database*, "Tables 9 and 10," 1986–2009.

Note: Details are provided for the five service industries with the largest imports or exports in 2009. Individual entries may not sum to totals due to rounding.

[a]To safeguard proprietary information, the USDOC suppressed data on professional, scientific, and technical sales abroad in 2007 and 2008; this category is therefore not included in the top five (based on 2009 data). These sales, however, were $114 billion in 2006 (third largest for 2006, excluding the "all other" aggregation).

Nature of Trade Restraints

Most U.S. government restrictions on services imports take the form of regulations that limit or prohibit foreign companies from operating and/or establishing subsidiaries in the United States. U.S. cabotage[105] laws, for example, act as a barrier to foreign companies seeking to provide freight shipping services within the United States. Under the Merchant Marine Act, also referred to as the Jones Act, cabotage in the United States may be provided only by ships that are registered, built, and maintained in the United States and owned by a U.S. citizen or corporation.[106] Similarly, U.S. air cabotage regulations prohibit the transportation of persons, property, or mail for compensation between points within the United States in a foreign civil aircraft.[107]

In the United States, federal regulations that restrict equity ownership positions by foreign persons or companies, or impose nationality requirements, may also act as a barrier to foreign services suppliers. In air transport services, for example, foreign persons or companies are not allowed to control U.S. airlines, with U.S. legislation limiting foreign ownership to 25 percent of voting shares and stipulating that the president and at least two-thirds of the board of directors and other managing officers must be U.S. citizens. Airplanes serving domestic routes within the United States are also required to be crewed by U.S. citizens or resident aliens.[108] Similarly, 75 percent of the

[105] Cabotage is defined as the transport of passengers and goods between two points within the country.

[106] 46 U.S.C.: Shipping. In 2002, the USITC modeled the impact of completely liberalizing the coastwise Jones Act fleet, with welfare effects estimated at $656 million. By contrast, liberalizing only the Jones Act's domestic-build requirement produced welfare effects of $261 million. USITC, *Import Restraints, Third Update*, 2002, 115–29.

[107] 19 C.F.R. 122.165 "Air Cabotage" (2011).

[108] 49 U.S.C. § 40102(a)(15); 49 U.S.C. § 41102(a).

crew operating Jones Act-compliant ships must be U.S. citizens. [109] In communication services, federal law restricts foreign investors to a direct ownership position of 20 percent in a broadcast, common carrier, or aeronautical radio station licensee, while indirect ownership is limited to 25 percent.[110] The United States' commitments under the WTO's Agreement on Basic Telecommunication Services also exclude foreign ownership in companies that offer direct-to-home, direct broadcast, and digital audio services to the U.S. market.[111]

Variations in state-level regulations and/or professional accreditation standards may pose impediments to foreign service providers. The property and casualty insurance industry, for example, is regulated by insurance regulators in 50 states, the District of Columbia, and five U.S. territories.[112] Such state-by-state regulations apply to both domestic companies and international affiliates. These regulations chiefly affect the services delivered by domestic subsidiaries rather than cross-border services flows. Like many companies, countries, and organizations around the world, the EU considers the U.S. state-by-state insurance regulatory framework to be an impediment to EU insurance companies, largely because companies entering the U.S. market face the 56 different insurance jurisdictions discussed above, each with its own licensing, solvency, and operating requirements.[113]

In legal services, each U.S. state has sovereignty over its court system, and therefore has the authority to establish the standards and qualifications necessary to practice law. The most notable example of this authority is the state-level bar exam, which lawyers must pass before offering legal services in a given state. Foreign lawyers wishing to operate in the United States also face foreign legal consultant (FLC) rules in 31 states (or jurisdictions), with such rules varying considerably from state to state.[114] In some states, for example, FLCs may only offer legal advice on home-country law, while in other states they may also give advice on third-country and international law. In some states, too, FLCs are allowed to operate only under the supervision of a local, state-qualified lawyer.[115]

This section does not attempt to quantify restrictions to trade in services, largely because such restrictions take the form of nontariff barriers applied "behind the border"—i.e., potentially anywhere within the national territory. They are therefore conceptually more difficult to quantify than barriers affecting trade in goods, which are applied by customs officials at border entry points. Nonetheless, researchers have begun to model trade in services, as well as broader "behind the border" issues, in CGE models, with such efforts showing potential for deriving large gains from liberalizing services restraints and other nontariff measures.[116] Such research has largely focused on overall gains from improved services efficiency, however, and so is not directly comparable to the modeling of specific restraints in this report.

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[109] 46 U.S.C.: Shipping.

[110] 47 U.S.C. § 310(b)(3); 47 U.S.C. § 310(b)(4).

[111] WTO, " Schedule of Specific Commitments," 1997.

[112] National Association of Insurance Commissioners, "About the NAIC" (accessed March 16, 2011).

[113] European Commission, *United States Barriers to Trade and Investment Report for 2008*, 2009, 87; Cooke and Skipper, "An Evaluation of U.S. Insurance Regulation," 2008.

[114] NCBE, ABA, *Comprehensive Guide to Bar Admission Requirements 2010*, 2010, 35–36; Terry, "Summary of State Action on ABA MJP Recommendations 8 & 9," October 2010, 1–2.

[115] Silver and DeBruin, "Comparative Analysis of United States Rules Licensing Legal Consultants," 2006.

[116] USITC, *Import Restraints, Sixth Update*, 2009, 101–5. The results reported by various studies are highly variable, largely because services restraints and other nontariff measures are difficult to specify. For more information, see Brown et al., "Multilateral, Regional and Bilateral Trade Policy Options," 2003; Hoekman, "Liberalizing Trade in Services," 2006; Robinson et al., "Capturing the Implications of Services Trade Liberalization," 2002.

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CHAPTER 3
Global Supply Chains

Development of Global Supply Chains

From automobiles, electronics, and plastics, to software development or clothing, many goods and services today are provided via global supply chains (box 3.1). Instead of carrying out everything from research and development (R&D) to delivery and retail within a single country, many industries are dividing this process into stages or tasks (or "fragments") that are then undertaken in many countries. The Apple iPod is a prominent example of a good produced via a global supply chain. Apple is headquartered in the United States and most of its R&D, marketing, top management, and corporate functions are located in the United States. The iPod's hard drive, however, was designed in Japan by Toshiba and built in factories in China and the Philippines. The controller chip was designed by the U.S. firm Portal Player, but is produced by firms in either Taiwan or the United States. Other parts are manufactured in Japan, Thailand, Taiwan, Korea, and Singapore. Finally, the iPod is assembled by Taiwanese manufacturing firms in China.[1]

Global supply chains have spread widely across both industries and countries. The global restructuring of production has led to faster growth in trade, new patterns of trade, and new benefits from trade. It may also have introduced new risks, including exposure to foreign shocks[2] and negative effects for workers in certain industries and occupations. This chapter begins with an overview of the key elements of global supply chains, the major economic forces behind the emergence of these chains, and their significance for global trade and development. This is followed by an in-depth look at the evolution of U.S. participation in supply chains, and the policies, institutions, and characteristics that have affected that participation. The chapter then examines some of the effects of global supply chains on U.S. companies, consumers, and workers. The final section explores U.S. supply chains in three sectors (apparel, motor vehicles, and televisions) in which U.S. trade and production have been substantially integrated into global supply chains. The case studies also include U.S. logistics providers, which provide a service essential to the efficient operation of global supply chains.

Key Elements of Global Supply Chains

Structure

The activities involved in a supply chain can be grouped into sequential or "vertical" stages. Figure 3.1 illustrates a simple supply chain, broken into broad stages from upstream R&D and design, through manufacturing, to downstream marketing, retail sales, delivery, and customer service. Each stage includes a large number of tasks. While many firms can carry out most stages or tasks internally, they often purchase raw materials and some service inputs from domestic or international suppliers. In a global

[1] The example refers to the fifth-generation iPod. Linden et al., "Who Profits from Innovation in Global Value Chains?" 2010; Linden et al., "Innovation and Job Creation in a Global Economy," 2011; Linden et al., "Who Captures Value in a Global Innovation System?" 2007.

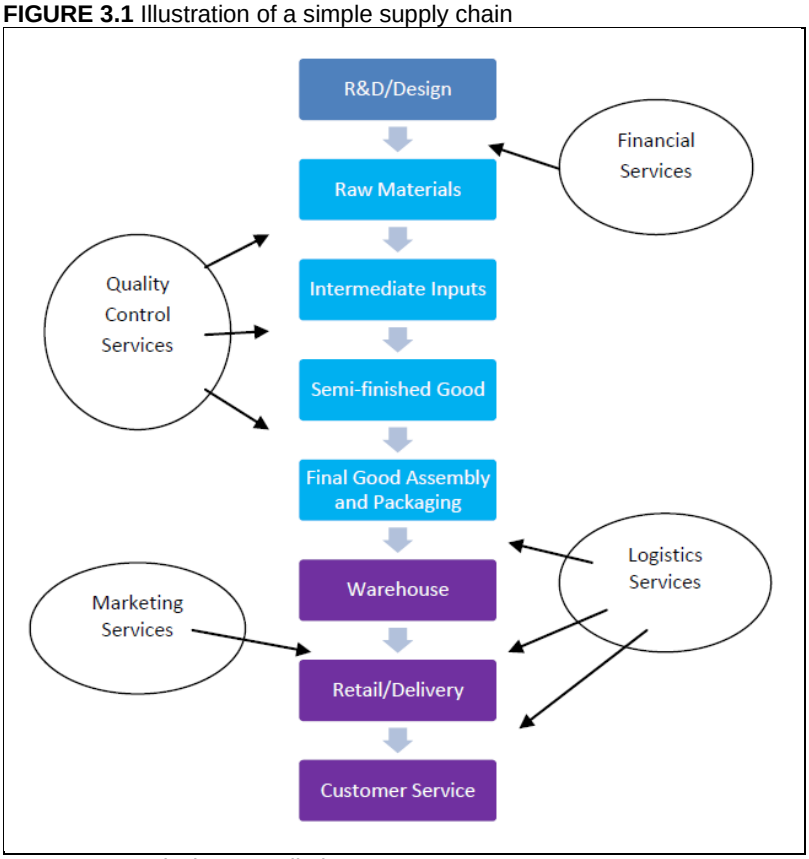
[2] Including economic and political shocks as well as natural disasters.

BOX 3.1 Global supply chain fundamentals

A **supply chain** is a production network between multiple firms that supply interlinked economic activities toward the provision of a final good or service. Because the firms contribute economic value through these activities, the chains are often referred to as **value chains**. In general, supply chains encompass all activities necessary to bring a product from conception to consumption. To the extent that they involve suppliers located in different countries, the chains are **global supply chains**. For purposes of this discussion, a regional supply chain—e.g., one involving two or three NAFTA countries—is considered "global" based on this definition.

Outsourcing refers to service or manufacturing activities that are contracted out to unrelated firms located either in the home country or abroad. **Offshoring** originally referred to service or manufacturing activities within the supply chain that are carried out by affiliates located in foreign countries. However, **offshoring** is now commonly used more broadly to refer to activities done abroad through both foreign affiliates and independent contracts. The provision of service or manufacturing activities by a domestic firm to a firm abroad is known as **inshoring**.

FIGURE 3.1 Illustration of a simple supply chain



Source: Commission compilation.

supply chain, many tasks are "offshored,"[3] either through the firm's own subsidiaries abroad or through independent contracts.[4] For example, a domestic firm might provide the R&D and design of a product, and produce the initial intermediate inputs using local raw materials, as in figure 3.1. Then these intermediate inputs would be exported to a second country, where a firm would use them to produce a semifinished product. That

[3] Feenstra, "Integration of Trade and Disintegration of Global Production in the Global Economy," 1998; Jones and Kierzkowski, "A Framework for Fragmentation," 2001; Deardorff, "International Provision of Trade in Services, Trade, and Fragmentation," 2001; Deardorff, "Fragmentation Across Cones," 2001; Grossman and Rossi-Hansberg, "Trading Tasks," 2008.

[4] Amiti and Wei, "Fear of Service Outsourcing," 2005; Spencer, "International Outsourcing and Incomplete Contracts," 2005.

firm would then export the semifinished good to a third country, where the final good is assembled and packaged. The third country would then export the good back to the domestic firm, which would oversee the marketing, retailing, and delivery of the product domestically and abroad. Supply chains like these require extensive organizational oversight. They also typically involve heavy reliance on telecommunications to ensure that different stages of the product are made to specification and on logistics to coordinate the movement of material across many firms and countries. As the case studies later in this chapter illustrate, global supply chains can involve complex interconnections between different tasks, as well as between domestic and foreign firms carrying out those tasks. This complexity is managed by lead firms in the chain that oversee production and make other key decisions (box 3.2).

Offshored tasks in a global chain can be done by independent foreign firms, by foreign affiliates, or both. Evidence from China, for example, indicates that most global supply chain manufacturing in China is done through foreign multinational subsidiaries or joint ventures.[5] The choice of affiliate versus independent firm is determined in part by the nature and maturity of the product, as well as the status of the intellectual property rights in the offshore site. If the product is new and embodies extensive R&D or intellectual property, firms may be less likely to offshore any tasks.[6] If they do offshore tasks, they may be more likely to use affiliates. This is due, in part, to the risk that intermediate goods may not be made to exact specifications if contracted to independent firms. It can also reflect concern about enforcement of contracts or property rights abroad.[7] Once a product is more standardized, firms are more likely both to offshore tasks and to do so using independent contractors.

Trade

Global supply chains have produced important changes in the nature and volume of global trade. Modern complex supply chains generate more trade than traditional supply networks in which only raw materials or final goods might be sent across international borders. In the earlier example of a supply chain in which the stages in figure 3.1 were carried out in three countries, the product was exported three times before being sold in final form at home or abroad. Global chains can also generate new patterns of specialization, as firms in a particular country often specialize in a particular stage or task.[8] In electronics, for example, intermediate and semifinished goods are often produced in Japan, Hong Kong, South Korea, and Taiwan, while final assembly activities are often contracted to Chinese firms.[9] Finally, global chains can change the nature of a nation's trade. As countries become more vertically specialized, their imports and exports are increasingly composed of intermediate goods and services that are moving to the next stage in the chain.

[5] Dean et al., "Decomposing China-Japan-U.S. Trade," 2009; Feenstra and Hanson, "Ownership and Control in Outsourcing to China," 2005.

[6] Antras, "Incomplete Contracts and the Product Cycle," 2005. For an examination of the potential increase in affiliate sales if intellectual property rights protection in China is improved, see USITC, "China: Effects of Intellectual Property Infringement and Indigenous Innovation Polices on the U.S. Economy," 2011.

[7] For example, American Tower, a provider of wireless network infrastructure and services, requires an extensive review of intellectual property rights protection before it will consider partnering with a firm in any foreign country. See Taiclet, "Keynote Address," April 5, 2011.

[8] Hummels et al., "The Nature and Growth of Vertical Specialization in World Trade," 2001.

[9] Dean et al., "Decomposing China-Japan-U.S. Trade," 2009.

BOX 3.2 Leadership of global chains

Supply chains are typically initiated and overseen by a limited number of lead firms. In a **producer-driven chain**, the lead firms are usually involved in R&D and design (the upstream end of the chain). These chains are most often found in high-tech goods that embody specialized design, complex production processes, and extensive R&D, such as electronics, semiconductors, computers, software development, and pharmaceuticals. In these types of chains, the production process itself is often fragmented, and the fragments are carried out in different countries. In one producer-driven chain, for example, U.S.-based lead firms design electronic products and component specifications. The components are produced in Asia and exported to Mexico, where affiliates of U.S. manufacturers use them to produce the electronic products. The finished products are then exported to the United States, where the U.S. lead firms carry out marketing and sales.[a]

Buyer-driven chains generally are led by firms involved in retail (the downstream end of the chain). These chains are more often associated with standardized, lower-tech goods such as apparel, which require less sophisticated capital equipment and fewer skilled workers. In these chains, the production process itself may not be fragmented, but may instead be done completely offshore. The apparel case study later in this chapter illustrates three types of buyer-driven supply chains, where the U.S. lead firms are branded marketers, large retailers, or branded manufacturers. These lead firms are involved (in varying degrees) in marketing and service activities, but contract out actual apparel production to foreign firms.[b]

[a]Sturgeon and Kawakami, "Global Value Chains in the Electronics Industry," 2010.
[b]Gereffi, "International Trade and Industrial Upgrading in the Apparel Commodity Chain," 1999; Gereffi and Frederick, "The Global Apparel Value Chain, Trade, and the Crisis," 2010.

Major Economic Forces Driving the Development of Chains

Technological Change

A key force behind the widespread development of global supply chains has been technological change. Over time, technological change has allowed more production processes to be fragmented—split into stages or tasks—and those stages or tasks to be carried out in new, often distant locations. For example, in the 1970s some apparel production for the U.S. market was offshored in nearby countries in the Caribbean region. But advances in telecommunications and in transport have allowed the industry to source from distant Asian suppliers and still meet the time-sensitive demands of the industry.[10] Since the introduction of just-in-time technologies in the 1980s, the automobile industry has been significantly restructured, enabling it to rely on complex global and regional networks with tiers of suppliers of parts and components. In the mid-1990s, the increased speed of communications via the Internet allowed the Indian software industry to become a key player in global chains. Swiss Airlines, American Airlines, and Singapore Airlines began contracting with Indian firms for flight scheduling, and Reebok and Nordstrom had their inventory software developed and supported by the Indian firm Infosys.[11]

International Cost Differences

International cost differences have been another driving force behind the spread of global chains. Some tasks require higher skills or more complex equipment than other tasks, and a global chain allows a firm to reduce costs by locating activities in different countries based on their respective comparative advantages. Semiconductor production, for

[10] David Hummels notes that faster delivery, including higher ship speeds and a shift to air transport, is "the most obvious quality improvement" in international transport. Hummels, "Have International Transport Costs Declined?" 1999, 21–22.
[11] Lateef, "Linking Up with the Global Economy," 1997.

example, can be broken into three stages: design, front-end fabrication, and back-end production. The majority of semiconductor producers, which carry out the design stage, are located in the United States, Japan, Taiwan, Korea, and the European Union (EU), where higher-skilled labor is relatively abundant and, thus, relatively less expensive. Front-end production, the stage requiring the most intensive use of capital and technology, also takes place in the EU, Japan, Taiwan, and the United States. Back-end testing, assembly, and production, which are relatively less skill-intensive, have generally been located in countries such as China, where lower-skilled labor is relatively more abundant and, thus, relatively less expensive.[12] The result is a more efficient, lower-cost production process.

Lower Trade and Transport Costs

Two other important drivers in the development of global chains are the extensive global trade liberalization (e.g., reduction in tariff and nontariff barriers) and falling transportation costs that have occurred in the past quarter-century.[13] Because goods and services produced by global supply chains typically cross borders multiple times, they pass through multiple customs regimes and are affected by multiple tariffs and nontariff barriers. Thus, the benefits of trade liberalization can also be multiplied for goods and services produced in global supply chains. The Uruguay Round negotiations, a major multilateral trade liberalization completed in 1994,[14] resulted in average tariff reductions of 38 percent among industrialized nations, as well as liberalized trade in textiles and apparel and reductions to barriers in services trade. Created at the same time, the World Trade Organization (WTO) and its dispute settlement mechanism have contributed to a more open and orderly trading system.[15]

Bilateral and unilateral trade liberalization has also contributed to the formation of global supply chains, as have programs that encourage duty-free trade in parts and components. For example, the United States established programs as early as the 1950s to allow duty-free imports of U.S.-origin components contained in imported articles. This treatment has encouraged the use of U.S. components in foreign assembly operations and reduced the tariff costs associated with these supply chains. Other countries or regional blocs, such as the EU, have similar provisions.[16]

Similarly, falling transportation costs in the past three decades have significantly lowered the cost of shipping semifinished inputs between countries. These developments have reduced the obstacles to locating stages of production in different countries.

Improved International Logistics

Logistics, the coordinated movement of goods and services, has become essential to the smooth flow of goods and services in many internationally fragmented supply chains. In fact, as discussed in the case study at the end of this chapter, the rise of low-cost, efficient, and globally integrated logistics firms is one factor that has spurred the creation of global chains. The development of logistics firms that offer multiple logistics services

[12] Yinug, "Challenges to Foreign Investment in High-Tech Semiconductor Production in China," 2009.

[13] In some exceptional cases, trade restrictions may themselves have led to the break up of single-country production systems and the formation of global supply chains. For example, the voluntary export restraints under which Japanese automakers found themselves in the 1980s may have led them to invest in auto production in the United States and to form auto parts supply chains between the United States and Japan.

[14] Jackson, *The World Trading System*, 1997, 74.

[15] Additional accomplishments are noted in USITC, *Import Restraints, Sixth Update*, 2009, 83–87.

[16] USITC, *Production Sharing*, 1989, chap. 9 and app. A.

(such as warehousing, distribution, tracking, and customs brokerage) has enabled lead firms to manage larger and more complex chains. Technological advances, particularly via the Internet, have helped improve network communications and reduced logistics costs. Lowering the cost of logistics services can increase the number of suppliers and the complexity of the relationships that a lead firm can profitably incorporate in a supply chain.[17]

Improved Intellectual Property Rights Protection and Contract Enforcement

Finally, improvements in intellectual property rights protection and contract enforcement in some countries may have facilitated the creation of global chains. From a lead firm's point of view, the prospect of overseeing contracts with independent firms, or setting up subsidiaries abroad to carry out offshored tasks, often implies additional risk. As noted earlier, this risk can both reduce the number of activities a firm offshores and determine whether or not the firm carries out those tasks via foreign investment or independent firms.[18] To the extent that countries have improved laws and regulations regarding intellectual property and contracts, their business environment will be more conducive to their participation in global chains.[19]

Growth of Global Supply Chains in World Trade

As global supply chains proliferate and expand, it is likely that they account for a growing share of world trade. However, because detailed trade data for such chains are not typically available, their share of world trade is difficult to measure. Researchers have turned instead to a variety of other methods to try to identify such trade (box 3.3). Evidence gathered from all these methods suggests that global supply chains are growing in importance in global trade.

Trade in Parts and Components

Because supply chains involve extensive trade in intermediate and semifinished goods, some broad evidence of their importance can be found by measuring trade in parts and components. World trade in parts and components grew by about 9 percent per year from 1990 to 2000, outstripping total world trade growth of 6.5 percent per year.[20] There is also evidence of a strong network of Asian suppliers in parts and components. Estimates for 1984–96 showed that Asian global exports of parts and components grew by more than 500 percent, compared to Asian total export growth of 300 percent.[21] A similar analysis found that the share of East Asia in global exports of parts and components grew from 29.3 percent in 1992 to 39.2 percent in 2003.[22]

[17] Jones et al., "What Does Evidence Tell Us about Fragmentation and Outsourcing?" 2005.

[18] Antras, "Incomplete Contracts and the Product Cycle," 2005; Feenstra and Hanson, "Ownership and Control in Outsourcing to China," 2005.

[19] In the plastics industry, for example, Gloucester Engineering has extended its chain to include Malaysia, in part because of Malaysia's improved property rights protection. See Johnson, "Doing Business in Malaysia," April 5, 2011.

[20] Jones et al., "What Does Evidence Tell Us about Fragmentation and Outsourcing?" 2005.

[21] Ng and Yeats, "Major Trade Trends in East Asia," 2003.

[22] Athukorala, "The Rise of China and East Asian Export Performance," 2009; Athukorala and Yamashita, "Production Fragmentation and Trade Integration," 2006. These authors also found evidence that the share of components in intra-regional trade was far higher than its share in extra-regional trade.

BOX 3.3 Measuring trade and value in global supply chains

Several methods have been used to measure the extent of global supply chain activity in world trade. Some methods rely only on trade data. One method uses detailed trade data to identify **trade in parts and components**. Another uses special customs data reported by some countries to measure **processing trade**, which includes imported goods used as inputs into products made solely for export (processing imports) and exports embodying processing imports (processing exports). China and Mexico account for a large portion of global processing trade, and both report such data.[a]

Other methods also incorporate input-output tables to measure the foreign content in domestic production or exports. Measures of **foreign content in intermediate use** (also known as offshoring intensity) examine the share of all intermediate inputs that come from abroad for use by domestic companies. Such inputs can include intermediate goods (e.g., hard drives) or intermediate services (e.g., accounting or information technology services) that firms use to produce goods for domestic use or exports. Measures of **foreign content in exports** (also known as vertical specialization) rely on estimates of the value of imported inputs used directly and indirectly in an exported good or service. If foreign content is high, this would suggest the country is extensively involved in global chains. If firms in the country lie far downstream in the chain, most of the value of the product will have been contributed by foreign countries at earlier stages in the chain. Thus, high foreign content might suggest that the country is specialized toward the downstream end of a global supply chain (e.g., in assembly, marketing, or sales).

A recent, more extensive approach uses global input-output data to track the sources and destination of value contributed by workers and companies in each country. Such databases capture value that flows directly between countries or through intermediate countries in the chain. This approach is based on **value added**, which is the difference between the cost of intermediate inputs a firm receives and the price paid by the next firm (or consumer) in the chain. This value includes workers' wages and company profits, and is tracked in input-output tables along with the value of intermediate inputs. The examination of U.S. participation later in the chapter measures value added in imports, value added in exports, and value added in absorption. **Absorption** is similar to demand and encompasses both intermediate inputs used by manufacturers and final goods and services used by consumers.

The copious data used in methods relying on input-output tables creates a tradeoff between timeliness and accuracy. Measures of foreign content generally employ data from a single country or a limited set of countries and are available on an annual basis up to 2008, but the more comprehensive value-added measures using worldwide data provide a snapshot of only a single year (currently only 2004 is available).

[a]China reports processing trade using data on special customs regimes. Mexico reports export processing data for IMMEX, formerly the Maquiladora and PITEX programs. See USITC, *Production Sharing*, 1999.

Processing Trade

Numerous countries have set up programs to encourage processing trade, which allow duty-free imports of components used in products made solely for export. Using data on these programs provides a more direct measure of global supply chain trade, since all of the trade in the components and products affected by the programs moves through a supply chain. China and Mexico are the two largest users of export processing regimes in the developing world, and together account for about 80–85 percent of such exports worldwide.[23] Chinese trade grew by more than 800 percent between 1995 and 2008—and about half of this growth is attributable to Chinese processing trade.[24] Mexico is also heavily reliant on processing trade; processing imports represented over 50 percent of total Mexican imports in 2006.[25]

[23] Koopman et al., "Give Credit Where Credit Is Due," 2010, 17.
[24] Dean et al., "Measuring Vertical Specialization," 2011.
[25] De La Cruz et al., "Estimating Foreign Value-added in Mexico's Manufacturing Exports," 2010.

Foreign Content in Exports

As discussed earlier in this chapter, firms in supply chains often import a semifinished product from the firm at the previous stage in the chain, add value, and then send that product to the country at the next stage in the chain. Measuring the share of imported inputs (foreign content) in the value of a country's exports might broadly indicate the extent of that country's participation in global chains and whether its firms are specialized upstream or downstream in the chain. Early evidence for countries belonging to the Organisation for Economic Co-operation and Development (OECD) showed that the foreign content of their exports was only about 16 percent in 1970, but grew to about 20 percent by 1990.[26] More recently, evidence for China indicated that in 2002, foreign content accounted for as much as 46 percent of China's total exports and 74 percent of its processing exports. For some products, like computers, the estimated foreign content in Chinese exports was as much as 95 percent.[27]

Evidence from recent studies measuring sources of value added in traded goods and services suggests that foreign content accounts for about one-quarter of global exports.[28] This share varies substantially by region, however. Emerging East Asian economies are the most integrated into global supply chains, with foreign content shares commonly exceeding 40 percent of export value. Major advanced economies (the United States, Japan, and the EU) have much lower foreign content shares of about 12 percent.[29]

Significance of Global Supply Chains for World Trade and Economic Development

Magnified Effect of Tariff Cuts

Since the 1960s, the growth in global manufactured exports has been dramatic. Recent evidence suggests that global supply chains can explain a significant part of this growth.[30] As noted earlier, every time an intermediate good in a global chain crosses a border, it may incur a tariff. Thus, a reduction in tariffs is likely to cause a magnified cost reduction for a good produced in a global chain and a magnified increase in trade. In addition, new global chains may become cost-effective only when reductions in tariffs are sufficiently large.[31] If so, the extensive trade liberalization in the developing world, from the mid-1980s onward, may have stimulated new global chains by making it more profitable to offshore tasks to these countries.[32] The development of these new global chains would further magnify trade, compared to trade solely in final goods.

Changes in the Pattern of Trade

The ability to split the production process into tasks that can be done in different locations implies at least three important changes in the pattern of global trade. First, it means a change in the nature of specialization. Traditionally, a country's production and

[26] Hummels et al., "The Nature and Growth of Vertical Specialization in World Trade," 2001, 83.

[27] Dean et al., "Measuring Vertical Specialization," 2011; Koopman et al., "How Much of Chinese Exports Is Really Made in China?" 2008.

[28] Values reported here are from Koopman et al., "Give Credit Where Credit Is Due," 2010. See also Johnson and Noguera, "Accounting for Intermediates," 2010; Daudin et al., "Who Produces for Whom in the World Economy?" 2009.

[29] Koopman et al., "Give Credit Where Credit Is Due," 2010.

[30] Yi, "Can Vertical Specialization Explain the Growth of World Trade?" 2003.

[31] Ibid.

[32] Dean et al., "Trade Policy Reform in Developing Countries since 1985," 1994.

exports were concentrated in goods or services in which the country had a comparative advantage. Now specialization is more finely defined, with countries specializing in stages or tasks *within* products, based on comparative advantage. Second, this new pattern of specialization has generated a change in the nature of trade flows. The expansion of global supply chains is likely to increases the trade between industrial and developing countries, since the location of tasks depends upon differences in comparative advantage.[33] Third, the international fragmentation of production means the pattern of trade will be more sequential and more dominated by trade in intermediate goods.

Trade patterns in the semiconductor industry illustrate these three effects. In the past, the United States would have exported products like semiconductors to China. Now, the United States performs the R&D, design, and front-end fabrication of a semiconductor, and exports it to a Southeast Asian country that performs the back-end testing, assembly, and packaging of that semiconductor. The Southeast Asian country then exports the packaged semiconductor to China, where it is incorporated into various electronic products and then exported to customers globally.[34]

Changes in the Benefits of Trade

Economy-wide benefits

Freer trade tends to bring benefits to a country as a whole. These national gains occur through two channels: producers increase profits as they specialize more in goods in which the country has a comparative advantage; consumers are able to buy goods at lower prices. Both of these gains increase a country's global purchasing power. The possibility of participating in global supply chains strengthens these national gains, because it means a good can be produced more efficiently than if the entire process had to take place in a single location. It also means that trade liberalization yields larger increases in national purchasing power, due to its magnified impact on trade in global chains.[35]

Global supply chains may bring additional gains for developing countries, through opportunities to participate in one or more stages in the production of technology- or skill-intensive products, instead of having to achieve mastery over the entire production process first.[36] Firms initially performing the least-skilled tasks may learn through interaction with other firms in the chain and be able to move to higher-value activities. Indian software firms in the 1990s, for example, were largely in the middle to lower end of the software development chain, engaged in contract programming, coding, and testing.[37] Yet now, partly because of the learning process just described, Indian firms engage in business and technology consulting, systems integration, product engineering, custom software development, and other more skill-intensive activities.[38]

[33] Arndt and Kierzkowski, *Fragmentation*, 2001.

[34] Evidence on this kind of change in trade patterns for China can be found in Dean et al., "Measuring Vertical Specialization," 2011, and Dean and Lovely, "Trade Growth, Production Fragmentation and China's Environment," 2010.

[35] Yi, "Can Vertical Specialization Explain the Growth of World Trade?" 2003.

[36] Arndt and Kierzkowski, "Fragmentation," 2001.

[37] Lateef, "Linking Up with the Global Economy," 1997.

[38] See Commander et al., "The Consequences of Globalisation," 2008; Infosys, "What We Do," http://www.infosys.com/about/what-we-do/Pages/index.aspx.

Small and medium-sized enterprises (SMEs) may see additional gains from global chains. Many SMEs are not able to obtain financing for exporting directly or to surmount other informational obstacles to participation in global markets.[39] However, these SMEs might be able to enter the global market indirectly, by contracting as a supplier in a global chain.[40] This is true for SMEs in both developing and industrial countries, but particularly so in developing countries, where business obstacles are larger.

Distributional benefits

Evaluating the effect of global supply chains on the benefits of trade, as well as on the distribution of those benefits within an economy, is not simple. Freer trade typically generates winners and losers within a country. This occurs because productive resources move away from industries in which the country does not have a comparative advantage and into industries in which it does. In a country where capital and high-skilled labor are relatively abundant, for example, this typically means a shift of resources out of less skill-intensive industries and into those that are more capital- and skill-intensive. In this example, earnings of higher-skilled workers and capital owners tend to rise, while those of lower-skilled workers tend to fall throughout the economy.

In the presence of global supply chains, an industry would now have the opportunity and incentive to split off the most low-skilled, labor-intensive activities within the chain to locations offshore, specialize in the remaining activities, and continue producing the final good. One effect of this would be to create winners and losers, as described above. However, the global chain could reduce the adjustment costs of shifting resources across industries and soften the impacts on the "losers" from freer trade.[41] If a firm is already offshoring some of its less skill-intensive tasks, and the costs of offshoring fall, then the cost saving on the already offshored tasks has the same effect as an increase in productivity for the firm's less-skilled workers. This provides an incentive to expand output. Thus, employment and/or wage losses might be mitigated, or even reversed.[42]

A number of studies have examined the effect of offshoring on relative wages or employment. The evidence on these issues is mixed. The evidence for the United States is discussed in detail later in this chapter.

New Concerns: Exposure to International Shocks

While global chains introduce new benefits, there is also a potential negative side to greater international integration: global chains can increase exposure to global shocks. As international trade relationships deepen, domestic economies can become more sensitive to both positive and negative economic developments overseas. As a result, trade flows and economic growth may become more synchronized across countries. When a country grows rapidly, it trades more, thus aiding growth in other countries connected with it directly or indirectly through its supply chain. By the same token, if a country undergoes a recession, or experiences internal strife or natural disasters, other countries in the supply chain will feel the effects, even if they do not trade directly with the affected country. For example, a decline in U.S. demand for electronics imports from China

[39] OECD, *Enhancing the Role of SMEs in Global Value Chains*, 2008.
[40] USITC, *Small and Medium-Sized Enterprises*, 2010.
[41] Arndt and Kierzkowski, *Fragmentation*, 2001; Jones and Kierzkowski, "A Framework for Fragmentation," 2001; Deardorff, "International Provision of Trade in Services," 2001.
[42] Grossman and Rossi-Hansberg, "Trading Tasks," 2008.

would reduce Chinese demand for electronics parts and components from Asian suppliers. Asian suppliers' exports would fall even if they had no direct exports to the United States.[43]

Extensive integration into global supply chains may also make trade flows more volatile. This observation, while not universally accepted, accords with trade patterns in the recent global recession. The volume of global trade declined by 25 percent from October 2008 to May 2009, while global industrial production declined by only 13 percent in that period.[44] This contraction of trade was unusually large by recent historical standards.[45] In part, the large trade decline in global chains was due to the composition of products produced by those chains: in recessions, demand for consumer electronics, automobiles, consumer appliances, and even clothing can contract sharply, leading to lower trade. But some economists have argued that global supply chains themselves have increased trade volatility, implying that large positive or negative swings may be a new and permanent feature of the global trade environment.[46]

The increased interrelationships caused by global chains may also lead to speedier transmission of supply shocks as well as demand shocks. For example, the earthquake and tsunami that hit Japan in March 2011 have disrupted some global supply chains. In the case of the motor vehicle industry, for example, the single-sourcing of certain paint pigments from a Japanese plant affected by the earthquake and tsunami has limited the availability of some vehicle colors for automakers such as Chrysler and Ford.[47] On the other hand, Japanese firms may be better able to limit the negative effects of the disaster on the Japanese economy because of their increased ability to import supplies—an ability facilitated by global supply chains.[48]

Evolving U.S. Position in Global Supply Chains

U.S. manufacturers have substantially increased their participation in global supply chains during the last few decades, although this growth has differed by industry. U.S. companies engage more intensively in global supply chains to source inputs for domestic consumption than to obtain materials for exports. The United States exchanges the most value in global chains with Canada, Mexico, the EU, Japan, and China, in the electronics, chemicals, motor vehicles, and apparel industries. In addition, U.S. foreign investment has contributed to the development of global supply chains in China, Mexico, and elsewhere.

[43] Bems et al., "The Collapse of Global Trade," 2009.

[44] Baldwin and Taglioni, "The Great Trade Collapse and Trade Imbalances," 2009, 48. See also Baldwin, *The Great Trade Collapse*, 2009.

[45] Levchenko et al., "The Collapse of International Trade," 2009. See also Bems et al., "The Collapse of Global Trade," 2009.

[46] No consensus has emerged on this topic. Brad Jensen noted that it is not yet known whether supply chains contributed to the trade decline "in a nefarious way." USITC, hearing transcript, December 16, 2010, 77–78 (testimony of J. Bradford Jensen, associate professor, Georgetown University). See also Altomonte and Ottaviano, "Resilient to the Crisis?" 2009; O'Rourke, "Collapsing Trade in a Barbie World," 2009.

[47] Just-auto.com, "Japan Quake," March 28, 2011.

[48] Escaith et al., "Japan's Earthquake and Tsunami," 2011.

U.S. Participation in Global Supply Chains Has Increased Since the 1980s

Manufacturing

Though it is not a new phenomenon,[49] U.S. manufacturers have become much more involved in global supply chains in recent decades. Estimates of a country's participation in global supply chains often examine the use of imported intermediate inputs in domestic production. A common approach measures a domestic industry's purchases of imported inputs relative to its total purchases of inputs.[50] This measure (foreign content in inputs used by domestic manufacturers) indicates that U.S. manufacturers' use of global supply chains grew about fourfold between 1980 and 2006 (figure 3.2).[51] Most of this increase has occurred since 1990, a period during which increased computer use and improved telecommunications facilitated global integration of operations. This was also a period of accelerated cross-border integration of manufacturing in North America under NAFTA. Industries with the largest shares of imported inputs in 2006 were apparel and leather products (25.7 percent); motor vehicles and parts (25.6 percent); and computers and electronics (20.8 percent).[52]

A related indicator of U.S. involvement in global supply chains is the amount of imported intermediate inputs embodied in U.S. exports (foreign content in exports).[53] An example of such an input would be a Mexican auto part used in a car assembled in the United States and exported to Canada. Imported inputs accounted for only 8.5 percent of the total value of U.S. merchandise exports in 1977.[54] This measure trended slowly upward and peaked at 15.9 percent in 2008.[55] Annual estimates available since 1998 show that foreign content in exports tends to decline during global trade downturns, as in 2001 and 2009, and then return to its generally upward trajectory.[56]

A comparison of the two measures shows that foreign content in inputs used by domestic U.S. manufacturers rose faster than foreign content in U.S. exports since the 1980s, and is

[49] The United States has been involved in global supply chains since at least the 1800s, when it was a major exporter of cotton to Britain, which produced textiles and exported cotton fabrics and finished garments to the world. Robertson, *History of the American Economy*, 1973, 116–117, 252. Other examples include the sewing of brassieres and baseball gloves in the Philippines before 1950 using U.S.-origin fabric and leather. Motor vehicles is another sector in which the U.S. has long been involved in regional and global supply chains. The Canada-U.S. Automotive Products Agreement of 1965 fostered North American integration in the sector by removing tariffs on motor vehicles and parts traded between the two countries. See the motor vehicle case study at the end of the chapter for recent developments.

[50] The first use of this measure was in Feenstra, "U.S. Imports, 1972–1994," 1996.

[51] Feenstra and Jensen, "Evaluating Estimates of Materials Offshoring," 2009.

[52] Milberg, written submission to the USITC, December 20, 2010, figure 2a. For some products, however, a substantial share of import value consists of U.S. value returning home after processing abroad. The estimates in the following sections based on value-added flows are thus better estimates of foreign content in U.S. inputs and exports, although these estimates are available only for one year (2004).

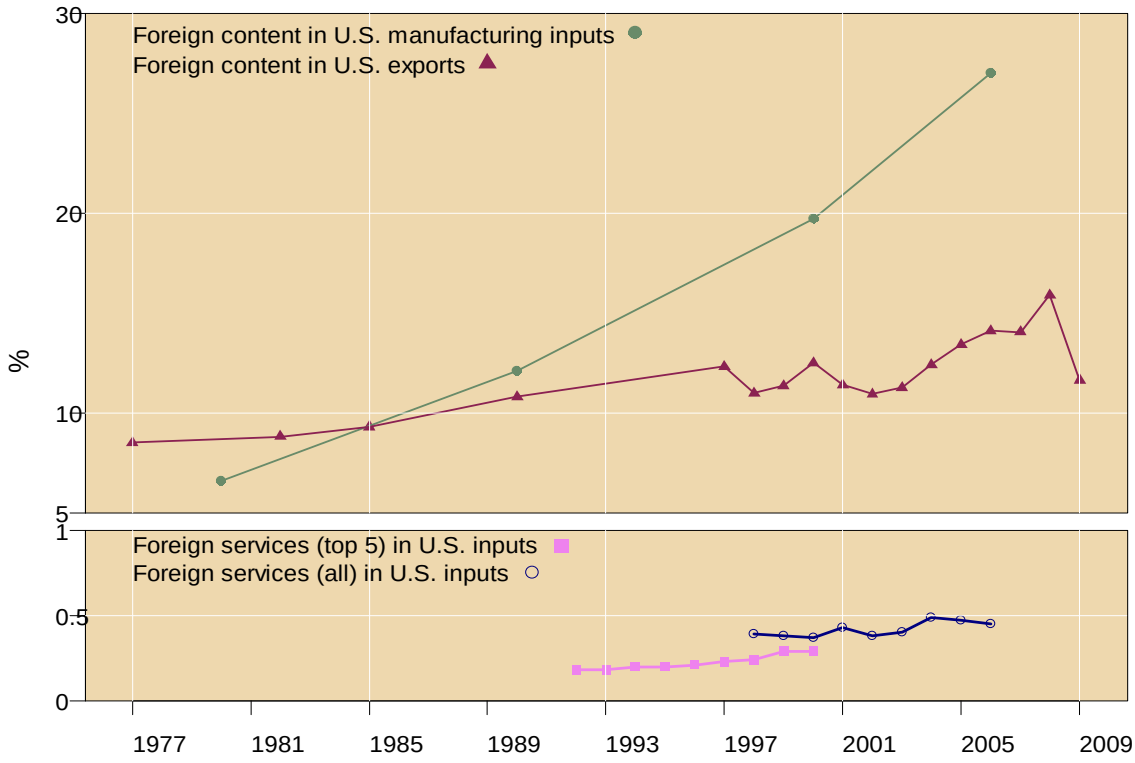
[53] This indicator is commonly called vertical specialization. Hummels et al., "The Nature and Growth of Vertical Specialization in World Trade," 2001, 77. Global use of imported intermediate inputs has risen since the 1980s, indicating increasing use of global supply chains. This measure has not increased markedly for the United States in this period, however, so the discussion in this section focuses on foreign content in U.S. trade. See Chen et al., "Vertical Specialization and Three Facts about U.S. International Trade," 2005, 41; Miroudot et al., "Trade in Intermediate Goods and Services," 2009, 51.

[54] Chen et al., "Vertical Specialization and Three Facts about U.S. International Trade," 2005, 42; Bridgman, "The Rise of Vertical Specialization Trade," 2010, 20.

[55] Commission estimates for 1998 to 2009 using annual BEA input-output tables.

[56] This decline reflects the overall drop in trade in global supply chains during recessions. See section on "new concerns" above for discussion of potential causes.

FIGURE 3.2 Measures of U.S. participation in global supply chains, 1977–2009



Sources: Feenstra and Jenson, "Evaluating Estimates of Materials," 2009; Chen et al., "Vertical Specialization," 2005; Amiti and Wei, "Fear of Service Outsourcing," 2005; Milberg, written submission to the USITC, December 20, 2010; and Commission estimates.

now substantially higher. Hence, the United States has increased its use of imported intermediate inputs, but these imports have largely been consumed at home and not been used as extensively by U.S. exporters. In contrast, the most active countries in global supply chains, such as Mexico and emerging Asian economies, incorporate a much higher share (often greater than 40 percent) of foreign inputs into their exports.[57]

Services

U.S. services trade (both imports and exports) in global supply chains has increased over time and is likely to continue to grow rapidly in the future. However, services are less integrated than goods into global supply chains; for example, U.S. companies currently use substantially fewer imported services inputs than imported goods inputs. One reason for this disparity is that as a practical matter, some services can only be provided locally or through direct personal contact. Similarly, although services accounted for 82 percent of U.S. GDP in 2010, they only accounted for 17 percent of U.S. imports and 30 percent of U.S. exports in the same year.

The value of imported services (such as communications, information technology [IT], accounting, and financial services) used by U.S. industry is reportedly quite limited, although studies have not examined the most recent data. One study showed that U.S. manufacturers' purchases of imported services increased as a share of their total

[57] Koopman et al., "Give Credit Where Credit Is Due," 2010, 36–37. In fact, as noted earlier for Chinese processing trade, exports from these countries may include more foreign inputs than the goods and services they consume domestically.

purchases of inputs between 1992 and 2000 (figure 3.2), though from a very small base.[58] Thus, the value of imported services, such as accounting services provided by a company in India, made up considerably less than 0.5 percent of the total value of all inputs to manufacturing (including domestic services inputs and manufactured inputs such as the auto parts mentioned above). Other work showed that this measure (use of imported services as a share of total inputs) continued to increase between 1998 and 2006, but that imported services still accounted for less than 0.5 percent of total input purchases in 2006.[59] Another study examined the shares of imported services used by both manufacturers and services providers. Of the two groups, U.S. manufacturers buy more inputs of services from providers overseas than do U.S. service providers. Even in detailed industry categories, services offshoring rarely represents more than 2 percent of total purchases of inputs.[60]

Evidence from specific firms in professional services industries supports these findings. A study of 200 U.S. firms in architecture, engineering, computer systems design, and business support services found little services offshoring: less than 20 percent of all U.S. multinational companies (MNCs) imported services from 1999 to 2003.[61] Moreover, there was little consistent growth in services offshoring for these MNCs during that period.

Although U.S. firms have not substantially increased their offshoring of services, some researchers have focused on identifying which services could potentially be offshored. Services that do not require face-to-face contact have the potential to move overseas.[62] Services that are traded domestically across different parts of the United States also provide some insight into which services could be offshored. By this measure, studies have found that a significant portion of the overall services sector could be traded abroad. Professional services are viewed as especially tradable: about 70 percent of workers in the sector are deemed to perform a tradable activity.[63]

The United States also contributes substantial exports of services in global supply chains. As noted in chapter 2, the United States is a net exporter of services and has a comparative advantage in many services sectors.[64] U.S. workers in many tradable services sectors have more education and higher skill levels than in the lower-paying nontradable service sectors.[65] These facts imply that the United States may gain good jobs in tradable services as services exports grow and become more integrated into global supply chains, although some services are at risk of being offshored to low-wage labor-abundant countries like India and China.[66]

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[58] Amiti and Wei, "Services Offshoring and Productivity," 2006, 8. Amiti and Wei examined imports of the top five services used by U.S. manufacturers as a share of their total input use. The five services were communications, financial services, insurance, business services, and computers and information services.

[59] Milberg, written submission to the USITC, December 20, 2010, figure 1; Milberg and Winkler, "Financialisation and the Dynamics of Offshoring in the USA," 2010, 281. Milberg and Winkler looked at a broader measure of services use than Amiti and Wei. They examined imports of all types of services used as inputs by both manufacturers and services firms.

[60] National Academy of Public Administration Panel, *Offshoring: How Big Is It*, 2006, chap. 3.

[61] Including imports from affiliated and unaffiliated sources. Ibid., chap. 6.

[62] Blinder, "Offshoring," 2006, 113–28.

[63] Jensen and Kletzer, "Tradable Services," 2005, 10, 30.

[64] For example, in 2009, the United States recorded large trade surpluses in financial services, travel services, and education services. USITC, *Recent Trends in U.S. Services Trade*, 2011, xiv–xv. See the section on the effects of these surpluses on the U.S. economy below.

[65] Jensen and Kletzer, "Tradable Services," 2005, 12.

[66] Jensen and Kletzer, "'Fear' and Offshoring," 2008, 1. Jensen and Kletzer estimate that 15–20 million jobs are at risk, with about half in the manufacturing sector. Liu and Trefler, "Much Ado about Nothing," 2008, 31–33, estimate that the effects of inshoring (the opposite of offshoring) are likely to be larger than offshoring, although both effects were small.

While statistics suggest that growth has been slow, offshoring of services is relatively new and has substantial growth potential. Global supply chains are likely to provide more services as companies seek to reduce costs by splitting apart such functions as human resources management, customer support, accounting and finance, and procurement and outsourcing those functions that can be done more efficiently or less expensively by others.[67] Also, R&D and knowledge-intensive services are increasingly being offshored. Many leading services providers are large global firms with headquarters in the United States (table 3.1). These firms have large worldwide workforces. For example, of Accenture's total employees, more were in India than anywhere else in 2007, and 60,000 of IBM's almost 400,000 total employees were in India in 2006. These firms employ their global workforce to supply a wide variety of services, including IT and business consulting, to U.S. firms and to other firms throughout the world.[68]

Information on Value Added Shows That the United States Participates in Supply Chains with a Variety of Countries[69]

When a good or service is produced in several different countries, official government trade statistics, which are based on the total value of the traded good, can inaccurately represent each country's contribution. As noted in the introduction to this chapter, the Apple iPod is composed of value created in many different countries, only a small share of which is produced in China, the exporter of the final good. The value contributed by each source country, both directly and through intermediate countries, reflects how deeply it is integrated into U.S. supply chains (refer to box 3.3 for details and definitions).[70] This section examines the contributors of value to U.S. imports, absorption, and exports.

Value Added in U.S. Imports

Although U.S. imports from China and Mexico are considerable, these countries contribute less value added to U.S. imports than Europe,[71] Canada, and Japan, the three largest contributors to value added (table 3.2). Remarkably, U.S. value added that returns home after receiving further processing elsewhere ranks fourth at 8.3 percent. Among all countries, the United States has the highest share of its own value-added exports returned home in its imports.[72] This high share reflects both the large size of the U.S. market and its tight integration with Canada and Mexico.

[67] Gereffi and Fernandez-Stark, "The Offshore Services Value Chain," 2010, 11–12. This view is also supported by the data on intermediate services trade, which now accounts for a substantial share of total services trade. The ratio of intermediate services trade to total services trade (54 percent) was higher than the comparable ratio for goods trade (52 percent) for the United States in 2005 (Miroudot et al., "Trade in Intermediate Goods and Services," 2009, 48).

[68] Gereffi and Fernandez-Stark, "The Offshore Services Value Chain," 2010, 10, 12.

[69] Value added is the value of output less the value of all intermediate inputs and therefore represents the contribution of labor and capital to the final product. See box 3.3.

[70] This section is based on the database detailed in Koopman et al. "Give Credit Where Credit Is Due," 2010. It is perhaps the most comprehensive attempt to trace value added in trade, but the data to meet its stringent requirements are currently only available for 2004.

[71] Europe refers to the entire EU (EU-27) plus the countries in the European Free Trade Association. The combined GDP of this region is very large and contributes to its prominence in tables in this section.

[72] The world average is 4.0 percent. Other economies with high shares include the EU (7.2 percent) and Japan (3.4 percent). Koopman et al., "Give Credit Where Credit Is Due," 2010, 36.

TABLE 3.1 Top 10 offshore services providers, 2008

Name	Home country	Employees	Services sales (millions of $)	Main activities
IBM	U.S.	398,455	58,892	Consulting, IT services
Accenture	U.S.	177,000	23,171	Consulting, IT services
HP Enterprise Services US (formerly EDS)	U.S.	139,500	22,100	IT, applications and business consulting
Computer Sciences Corp.	U.S.	92,000	16,740	Software management, customer relations management
Capgemini	France	89,453	12,740	Consulting, IT services
Automatic Data Processing	U.S.	45,000	8,867	Human resources, payroll, tax, and benefits
Affiliated Computer Services	U.S.	76,000	6,523	IT services, customer relations, human resources, e-government
Logica	UK	39,525	6,320	Business consulting, IT services
Tata Consultancy Services	India	111,407	5,824	Consulting, IT, engineering services
Infosys Technologies	India	105,453	4,533	IT, engineering, consulting, knowledge, and legal services

Source: Gereffi and Fernandez-Stark, "The Offshore Services Value Chain," 2010, 9.

TABLE 3.2 U.S. imports and value-added shares in U.S. imports, 2004, by source

Region	Total imports	Share of general imports	Share of value-added imports	Share of value added passing through a third country before entering the United States
	Millions of $	Percent		
Europe	393,301	24.7	26.1	17.6
Canada	242,170	15.2	11.0	3.2
Japan	138,417	8.7	10.4	26.0
United States	—	0.0	8.3	100.0
China	176,879	11.1	7.7	14.8
Mexico	154,571	9.7	4.9	4.0
Rest of Americas[a]	76,183	4.8	4.7	13.2
Developing East Asia	79,250	5.0	4.5	32.4
Taiwan, Singapore, Hong Kong	73,066	4.6	4.3	36.7
Korea	51,707	3.3	3.3	31.8
Brazil	23,662	1.5	1.6	20.3
Australia and New Zealand	15,717	1.0	1.3	33.6
Russia	12,003	0.8	1.3	46.4
India	17,486	1.1	1.1	22.0
South Asia	9,557	0.6	0.5	10.2
Rest of world	120,320	7.6	8.5	23.5
Total	1,590,124	100.0	100.0	25.8[b]

Source: Commission estimates.

[a]Including South American, Central American, and Caribbean countries other than Mexico and Brazil.
[b]U.S. average, weighted by U.S. imports from all sources.

The value-added approach more accurately portrays the origin of the value in U.S. imports than officially reported import data can. For example, Japan has an 8.7 percent share of total U.S. imports, but accounts for 10.4 percent of the value added in U.S. imports (hereafter "U.S. value-added imports"). Japan's higher share of value-added imports indicates that a substantial share of its exports (26 percent) first journey to other countries and undergo additional processing before being exported to the United States. Specifically, Japan produces a large volume of high-value components that are shipped to other Asian countries, particularly China, where they are assembled into consumer goods

and then exported.[73] In contrast, China's share of U.S. value-added imports (7.7 percent) is less than its share of total U.S. imports (11.1 percent). China is the final assembler in a number of supply chains in which Japan and other countries in East Asia supply parts. Similarly, exports from many smaller East Asian countries pass through third countries, such as China, before entering the United States. Canada and Mexico also have lower shares of U.S. value-added imports than their total U.S. imports. U.S. imports from Canada and Mexico contain many U.S.-produced components, which contribute to the large share of U.S. exported value that returns home.

Various countries and regions contribute value to U.S. imports in different sectors (table 3.3). Europe is the largest source of value added for many sectors, particularly business services. U.S. returned value added is most significant in motor vehicles and parts (19.1 percent); much of this represents value added returned home from other NAFTA countries, as the United States is heavily involved in auto supply chains in this region.[74] Europe and Japan also contribute significant amounts of value added to U.S. imports of motor vehicles and parts. U.S. returned value added is also fairly high for apparel (11.0 percent), since some rules of origin provide for duty-free imports of apparel made from U.S. yarns and fabrics (as discussed in the case study on apparel). East Asia,[75] which has abundant low-cost labor and is well integrated into supply chains with China, contributed the most value added to U.S. imports of apparel (27.8 percent).[76]

TABLE 3.3 Country or regional sources of value added in U.S. imports, selected sectors, 2004, percent

Sector	U.S returned	China	Japan	East Asia	Canada	Mexico	Latin America	Europe	Others	Total
Total	8.3	7.7	10.4	12.0	11.0	4.9	6.3	26.1	13.2	100.0
Selected Sectors										
Apparel	11.0	11.2	2.4	27.8	2.4	2.0	10.4	11.4	21.4	100.0
Chemicals, rubber and plastics	6.3	5.0	9.7	8.7	12.0	2.5	3.6	42.8	9.4	100.0
Motor vehicles and parts	19.1	2.5	23.0	7.2	16.0	3.8	1.9	23.1	3.4	100.0
Electronic equipment	8.6	14.4	19.0	29.6	2.4	9.3	1.3	11.4	3.9	100.0
Machinery and equipment	11.3	10.1	17.2	9.7	6.9	4.7	2.9	32.1	5.1	100.0
Business services	1.5	1.3	6.2	12.7	8.8	0.2	2.7	55.5	11.3	100.0

Source: Commission estimates.

Value Added in U.S. Absorption

The value-added shares of U.S. absorption (i.e., use of intermediate inputs plus consumption of final products, or equivalently total domestic expenditures on goods and services) provide another view of the sectors and regions where global value chains are important to the U.S. economy. Absorption can distinguish the relative U.S. and foreign value-added shares in products consumed in the United States. Overall, the United States itself generates a large share (89 percent) of the value of final and intermediate goods that it uses (table 3.4). This share is on a par with those of Japan (90 percent) and the EU-15

[73] Dean et al., "Decomposing China-Japan-U.S. Trade," 2009. Japan is also a leading supplier of components to Mexico's export processing industry, particularly for television and vehicle assembly.

[74] See the case study on autos and parts later in this chapter.

[75] East Asia includes Brunei, Cambodia, Timor-Leste, Korea, Hong Kong, Indonesia, Laos, Malaysia, Burma (Myanmar), the Philippines, Singapore, Taiwan, and Vietnam.

[76] Major changes have occurred in global supply chains involving textiles and apparel since 2004, and China's prominence in U.S. imports has increased. See the case study on apparel later in this chapter.

TABLE 3.4 Country or regional sources of value added in U.S. absorption, selected sectors, 2004, percent

Sector	U.S.	China	Japan	East Asia	Canada	Mexico	Latin America	Europe	Others	Total
Total	89.0	0.9	1.3	1.5	1.3	0.6	0.7	3.2	1.4	100.0
Selected sectors										
Apparel	54.3	4.1	0.6	18.3	2.1	1.8	5.7	2.9	8.6	100.0
Chemicals, rubber and plastics	69.1	3.1	4.2	4.2	3.4	0.8	1.4	11.9	1.5	100.0
Motor vehicles and parts	57.3	1.5	11.3	3.4	10.1	4.6	0.6	10.6	0.5	100.0
Electronic equipment	33.3	9.3	12.7	23.3	1.8	10.9	0.8	7.0	0.8	100.0
Machinery and equipment	76.1	2.7	4.5	3.1	2.2	1.6	0.7	8.4	0.6	100.0
Business services	88.5	0.3	1.4	1.1	1.4	0.0	0.5	5.9	0.8	100.0

Source: Commission estimates.

(88 percent), and is higher than those of most developing countries.[77] The many goods and services produced and consumed in the United States and the large portion of U.S. value returned in imports contribute to the high share.

Although overall U.S. value in absorption is high, the domestic value share is typically lower for sectors actively involved in global supply chains. There is substantial foreign content in electronic equipment, apparel, and motor vehicles. For apparel, consistent with value added in imports, China and East Asia contribute more value to U.S. absorption than Mexico and Latin America (largely from Central America).[78] As noted in the case study, Japan, Canada, and Europe are major participants in supply chains for motor vehicles and parts, and together account for almost one-third of the value added in U.S. absorption in the sector. Japan, East Asia, Mexico, and Europe participate in the supply chain for electronic equipment, which is one of the largest in terms of the number of countries contributing significant value added.[79] Electronics has the highest share of foreign content: fully two-thirds of the value of all electronics products used by U.S. industry and consumers originates abroad. Hence, foreign value in some U.S. industries may be substantially higher than estimates in previous studies based on gross input use or gross trade.[80]

In business services, a category that includes consulting and computer support, the United States provides a large portion (88.5 percent) of its absorbed value added, while Europe contributes 5.9 percent. Despite the high profile of India's consulting and computer services and the prominence of some large suppliers (table 3.2), India supplied only 0.1 percent of the value added in U.S. absorption of business services in 2004.

[77] EU-15 refers to the first 15 countries to join the EU. Domestic value-added shares for Japan, the EU-15, and other countries come from Koopman et al., "Give Credit Where Credit Is Due," 2010, 36.

[78] Given changes discussed in the apparel case study later in this chapter, China's contribution has likely grown since 2004.

[79] See the case study on televisions for an example of an electronic product in which Mexico is a major contributor.

[80] The Commission's estimate of foreign value in electronics is considerably higher than some previous estimates. For example, Professor William Milberg estimates that the share of foreign inputs in the electronics industry's use of intermediate inputs is about 20 percent. (Milberg, written submission to the USITC, December 20, 2010, 11.) Based on the Commission's data, the foreign value-added share in U.S. gross absorption of electronic equipment is 16 percent, which is similar to Milberg's estimate. These low values are based on gross input use, however. This report has argued that measures based solely on value added (such as the estimates in table 3.4) provide the most informative view on foreign content.

Value Added in U.S. Exports

Value added in U.S. exports measures how much different countries contribute to the value of exported goods and services. The United States contributed a high share (87.1 percent) of total value added to its exports in 2004 (table 3.5). The domestic content of exports remains high even in sectors such as electronics, where various countries contribute value added. This is in sharp contrast to emerging markets such as China, Malaysia, and Mexico that have substantial foreign value in their exports. The United States does have slightly higher foreign value in its exports than the other major developed economies (Japan and the EU).[81]

Europe contributes the largest foreign share of value in total U.S. exports (3.3 percent) with significant shares in many sectors, namely, electronic equipment; motor vehicles and parts; and chemicals, rubber, and plastic products.[82] The United States participates in various value chains with its NAFTA partners, Canada and Mexico. Canada contributes the largest single-country share of foreign value added in U.S. exports (1.7 percent) and is a key supplier of foreign value added in motor vehicles and parts and chemical, rubber, and plastic products.[83] Mexico's overall share (0.9 percent) is small but its contribution is important in sectors such as electronics and motor vehicles. The U.S. share of value added in its own exports is highest for business services (95.6 percent) and lowest for electronic equipment (76.9 percent), where many other countries contribute value added.

Value-added calculations provide a more revealing look at the contributors to U.S. imports and exports than can be seen in officially reported gross trade statistics. Hence, these trade statistics can also provide new insight into bilateral trade deficits. Box 3.4 compares bilateral deficit measures in gross terms to those measured using the value-added decomposition in this chapter.

TABLE 3.5 Country or regional sources of value added in U.S. exports, selected sectors, 2004, percent

Sector	U.S.	China	Japan	East Asia	Canada	Mexico	Latin America	Europe	Others	Total
Total	87.1	0.8	1.3	1.5	1.7	0.9	1.1	3.3	2.1	100.0
Selected sectors										
Apparel	88.5	0.7	0.8	1.5	1.3	0.6	0.7	3.3	2.5	100.0
Chemicals, rubber and plastics	85.5	0.5	1.0	1.1	2.2	0.7	1.5	4.4	3.0	100.0
Motor vehicles and parts	81.5	1.3	3.0	1.9	3.0	1.3	1.3	4.7	2.0	100.0
Electronic equipment	76.9	2.7	3.7	5.1	1.6	2.2	1.0	4.7	2.0	100.0
Machinery and equipment	89.4	1.0	1.2	1.3	1.3	0.8	0.8	2.8	1.4	100.0
Business services	95.6	0.2	0.6	0.7	0.5	0.2	0.2	1.4	0.6	100.0

Source: Commission estimates.

[81] Koopman et al., "Give Credit Where Credit Is Due," 2010, 35.

[82] This region was the largest destination for U.S. exports, accounting for just over 27 percent of total U.S. exports.

[83] The United States exported over $145 billion of chemical, rubber, and plastics products in 2004, about 14 percent of the global total.

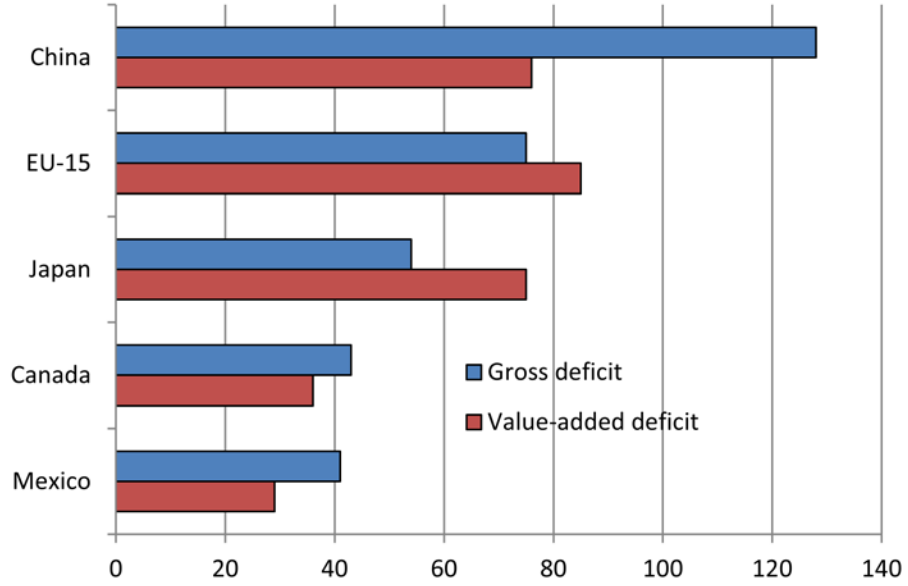
BOX 3.4 The U.S. value-added trade deficit

The U.S. trade balance, or the difference between U.S. exports and imports, is a frequently discussed trade issue. The United States has had large trade deficits in recent years (e.g., $500 billion in 2010), and it has also had substantial bilateral deficits with major trading partners.

This chapter shows repeatedly that many countries may add value to a particular good or service in a global supply chain, and that attributing the entire export value to the last exporting country can provide a misleading picture of the sources of value in U.S. trade. While the overall U.S. trade balance is not affected by any of the calculations in this chapter, examinations of bilateral trade balances on a value-added basis yield different conclusions about the extent to which specific foreign countries contribute to the U.S. deficit.[a]

The contribution of China to the U.S. trade deficit differs substantially depending on which of the two measures is used. As discussed in this chapter, China is the final assembler in a large number of global supply chains, and it uses components from many other countries to produce its exports. The figure below shows that the U.S.-China trade deficit on a value-added basis is considerably smaller (by about 40 percent in 2004) than on the commonly reported basis of official gross trade.[b] By contrast, Japan exports parts and components to countries throughout Asia; many of these components are eventually assembled into final products and exported to the United States. Thus the U.S.-Japan trade balance on a value-added basis is larger than the comparable gross trade deficit. The U.S. value-added trade deficits with other major trading partners (Canada, Mexico, and the EU-15) differ by smaller amounts from their corresponding gross trade deficits.

U.S. Bilateral Trade Deficits with Major Trading Partners, 2004 (billions of dollars)



Source: Commission estimates.

[a]USITC, hearing transcript, December 16, 2010, 12 (testimony of Kenneth Kraemer, professor, University of California, Irvine); Johnson and Noguera, "Accounting for Intermediates," 2010, 33.

[b]Using a slightly different method, a recent study found that this discrepancy was about 53 percent in 2005 and 42 percent in 2008. WTO, IDE-JETRO, *Trade Patterns and Global Value Chains in East Asia*, 2011, 104.

Investment Abroad Has Increased U.S. Participation in Global Supply Chains

U.S. investment abroad has contributed to the development of global supply chains.[84] For example, U.S. firms are key investors in Mexico's processing industry, which exports goods containing large shares of U.S. value added.[85] U.S. firms and other foreign firms also contributed to the growth of China's processing industry, which participates in supply chains with the United States and East Asia.[86] As previously noted, U.S. production is well integrated with that of Canada, a major recipient of U.S. foreign direct investment (FDI) in 2009. [87] About a third of U.S. manufacturing imports from Canada originate from U.S. firms operating in Canada, and many Canadian exports to the United States are intermediate products that contain a sizable component of U.S. value added and that are returning for further processing in the United States. Most U.S. FDI in 2009 was directed to Europe, a key U.S. supplier in global chains. U.S. investments abroad were primarily in the finance industry, the insurance industry, and a variety of manufacturing industries, including chemicals and machinery.

Investments by foreign firms in the United States similarly contribute to the growth of global supply chains. European countries, followed by Japan and Canada, were the primary sources of FDI into the United States in 2009.[88] Foreign multinationals investing in the United States commonly extend global supply chains from the parent firm to their affiliates. For example, Japanese automakers that manufacture cars in U.S. plants import some auto parts from Japan.[89] Such "vertical" FDI is particularly important for supply chains.

Policies and Institutions Have Affected U.S. Participation in Global Chains

U.S. government policies have neither directly promoted nor opposed the development of global supply chains. However, many policies and institutions, especially those concerning trade and foreign business conditions, indirectly affect the prevalence of supply chains. This section briefly surveys these factors.

Facilitating Factors

Private entrepreneurs seeking innovative ways to access markets and to lower costs have been the principal force behind global supply chains, which have developed despite differences in culture, administration, geography, and level of development among participants in the value chain.[90] These entrepreneurs are attracted by institutions that

[84] Gereffi, "Shifting Governance Structures in Global Commodity Chains," 2001, 1616. Along with increased use of the Internet, investment by multinational firms was a primary driver of the growth of global supply chains in the last part of the 20th century.

[85] The Mexican processing sector includes the IMMEX program (formerly the Maquiladora and PITEX programs), and is similar in nature to the Chinese processing regime discussed earlier in the chapter. In 2006, the United States supplied 51 percent of the value of Mexican processing imports, a high share but one that has declined from 81 percent in 2000 as Mexico has integrated into supply chains with other countries. See De La Cruz et al., "Estimating Foreign Value-added in Mexico's Manufacturing Exports," 2010, 4–6.

[86] Fung et al., *U.S. Direct Investment in China*, 2004, 5.

[87] Ibarra-Caton, "Direct Investment Positions for 2009," 2010, 32–33.

[88] Ibid., 34–35.

[89] Blonigen, "In Search of Substitution between Foreign Production and Exports," 2001, 94. Economists commonly find a complementary relation between FDI and imports from the parent's country. In this case, Blonigen found a substitution relationship: fewer Japanese cars were imported.

[90] Ghemawat, *Redefining Global Strategy*, 2007.

support business growth by providing for secure property rights and contract enforcement. Some governments have sought to improve their investment climate, which indirectly contributes to the formation of global value chains. For example, the USDOC SelectUSA program[91] encourages foreign firms to invest in new U.S. businesses and contributes to the formation of supply chains between the United States and the country of the investing parent firm.[92] The business climate in foreign countries is an important determinant of where U.S. firms choose to invest.[93]

As noted, the effects of tariff and other trade restraints are magnified in the case of goods passing through multiple borders in global supply chains.[94] U.S. supply chain development has thus benefited from trade liberalization abroad and from lower U.S. import restraints. For example, average U.S. tariffs have fallen considerably, from 3.4 percent in 1989 to 1.3 percent in 2010.[95] Similarly, the barriers that U.S. exporters face abroad fell during the period; the average tariff on U.S. exports is now about 3.0 percent, although some high tariffs remain.[96] Still, despite shrinking trade barriers, multiple border crossings raised the cost of exporting U.S. final goods by 46 percent (from 1.3 to 1.9 percentage points) in 2004, the most recent year for which data are available.[97]

U.S. free trade agreements (FTAs) and preferential trade programs also contributed to the creation of global supply chains.[98] NAFTA phased out a number of tariffs and other trade restrictions, and promoted the integrated production of many commodities in Canada, Mexico, and the United States. Since NAFTA entered into force in 1994, U.S.-Mexico trade in goods has more than tripled, and as much as 85 percent of Mexico's exports result from global supply chains.[99] The United States and Canada have a large, highly integrated trading relationship that includes value chains in auto parts and other products. Likewise, the Caribbean Basin Trade and Partnership Act and the Central America-Dominican Republic Free Trade Agreement (CAFTA-DR) have led to increased U.S. integration with Caribbean and Central American countries. Although highly efficient apparel supply chains in East Asia (particularly China) have supplanted apparel chains in this region to a large extent, collectively the CAFTA-DR countries were the second largest supplier of textiles and apparel to the United States in 2010 after China.[100]

Impeding Factors

Policies that limit trade tend to restrict the use of global supply chains, and many impediments to trade remain.[101] For example, customs procedures—both burdensome

[91] SelectUSA incorporated the "Invest in America" program in June 2011.

[92] There is some evidence that such programs can increase investment; see Harding and Javorcik, "Developing Economies and International Investors" 2007, 21–22.

[93] The United States has over 40 bilateral investment treaties, mostly with smaller countries, that seek to protect U.S. investment abroad. USDOS, *Bilateral Investment Treaties and Related Agreements*, March 3, 2008.

[94] Yi, "Can Multistage Production Explain the Home Bias in Trade?" 2010, 365; Ma and Assche, "The Role of Trade Costs in Global Production Networks," 2010.

[95] USITC, *Import Restraints, Sixth Update*, 2009, 1; this report, chap. 2.

[96] USITC, *Small and Medium-Sized Enterprises*, 2010, 6-15.

[97] Koopman et al., "Give Credit Where Credit Is Due," 2010, table 7.

[98] ROO in these agreements, as well as earlier trade programs such as U.S. production sharing tariff provisions, have facilitated supply chains with U.S. trading partners.

[99] De La Cruz et al., "Estimating Foreign Value-added in Mexico's Manufacturing Exports," 2011, 18, 24.

[100] Despite lower tariffs offered by CAFTA-DR, inefficient port operations in Central America make it difficult for these countries to take advantage of this agreement. Londoño-Kent et al., "A Tale of Two Ports," 2003, 20.

[101] See chap. 2 of this study for an analysis of significant U.S. restraints.

rules and inefficient port operations—often hinder the flow of goods.[102] Efficient operation of global supply chains requires adequate infrastructure at ports and airports, as well as speed and accuracy in the customs and security clearance process.[103] Extra time in transit, whether due to delays in customs clearance or transportation, raises trade costs and decreases the likelihood that trade will take place at all.[104]

Regulations that restrict foreign business practices also make it more difficult for global supply chains to flourish. These include policies that limit foreign investment, regulate the form that a foreign-owned establishment can take, restrict the hiring of personnel, and impose opaque and duplicative licensing requirements.[105] However, these restrictions do not necessarily make the operations of global supply chains impossible. In some cases, when faced with onerous regulations that may stifle foreign investment, foreign firms may still be able to contract local firms to complete tasks in a global supply chain; these firms may be more adept at dealing with (or exempt from) the local barriers.[106]

Effects of Global Supply Chains on the U.S. Economy

Key Effects

The expansion of global supply chains has had multifaceted and complex effects on the U.S. economy, which are challenging to quantify in terms of production, prices, and jobs. One reason it is difficult to measure these economic effects is that supply chains have rearranged the pattern of U.S. trade, increasingly concentrating the production and export of skill-intensive goods and services in the United States while relocating other, less skill-intensive activities to other countries. Global supply chains have induced many leading U.S. companies to change their business models, refocusing on coordinating the assets and expertise of their business partners, and placing less emphasis on owning all key technological and managerial assets. Advances in supply chain management by U.S. retailers have made it easier and cheaper to import an increasing variety of goods into the United States, with significant benefits to consumers. The effect of global supply chains on U.S. wages and employment varies for workers in different industries and occupations, and may also depend on the extent to which U.S. multinationals concentrate their activities in high-income or low-income countries.

The strength of the evidence linking global supply chains to the effects on companies, consumers, and workers varies, depending on the type of linkage being examined. Many of the observations in this section rely at least partly on indirect evidence and inference. There are several ways in which better measurement can aid further quantitative investigations on this topic; these possibilities are discussed at the end of this chapter.

[102] International logistics firms encounter their most significant impediment at the border clearance process. USITC, *Logistic Services,"* 2005, 3-2.

[103] USITC, hearing transcript, December 16, 2010, 39–43 (testimony of Michael Mullen, Express Association of America).

[104] Studies on the importance of time in trade include Hummels, "Calculating Tariff Equivalents for Time in Trade," 2007 and Djankov et al., "Trading on Time," 2006. Londoño-Kent provided information of border crossing frictions at the U.S.-Mexican border; see USITC, hearing transcript, December 16, 2010, 31–38.

[105] USITC, *Logistic Services*, 2005, 3-2.

[106] A U.S. industry source noted that Haitian firms can perform such tasks as Haitian customs clearance more efficiently than U.S. firms and added that for this reason, it is more efficient to contract for services there than to invest directly. USITC, *Textiles and Apparel*, 2008, 1–12.

Effects on the Pattern of U.S. Production and Trade

U.S. Multinational Firms, Now Acting as Coordinators of Networks

As already mentioned, the advent of global supply chains has required major U.S. companies to revise their business models to become network facilitators, with successful firms acting as coordinators of capabilities among multiple strategic allies.[107] As firms expand their global supply chains, their ability to grow and remain profitable depends on managing their relationships with an ever-larger network of suppliers and customers.[108] It is less and less likely that a firm managing a global supply chain will own all of the assets needed to succeed in a single vertically integrated operation. Thus, the focus of multinational firms' strategy is increasingly on alliances. These alliances range in their degree of formality from turnkey operations to joint ventures. When a high degree of coordination is required, such alliances may result in mergers or acquisitions.[109]

The increasing reliance on strategic networks means that successful U.S. multinationals must operate very differently than they did in earlier decades, when there was a greater tendency for firms to control all phases of their operations directly. Today, personal computer companies such as Apple, Dell, and Hewlett-Packard (HP) specialize in consumer-oriented aspects of computer design, while Taiwan-based manufacturers are increasingly responsible for designing a computer's physical architecture, finding suppliers for subcomponents, and making sure the pieces fit.[110] Similarly, as discussed below in the apparel case study, U.S. retailers of apparel like Wal-Mart and Limited Brands are linked indirectly to a wide variety of textiles and apparel suppliers worldwide, often relying on specialized middlemen such as the Hong Kong-based Li & Fung.

The effect of these changes has been to enhance the leadership of U.S. multinationals in some industries, but not universally. Companies such as HP that successfully transitioned to a role as coordinator of networks thrive and remain global lead firms, while those that failed to do so have declined. For example, U.S. television producers did not adapt to technological changes as readily as other electronics firms, thus ceding their role as network coordinators to Japanese and Korean firms (see the television case study later in this chapter).

Relocation of Tasks

As discussed above, the development of supply chains enables different parts of the production process to be carried out in various locations, allowing countries to specialize in tasks rather than in goods.[111] In general, as already noted, this industrial restructuring has led firms in the United States to increasingly specialize in mid- to high-skilled tasks; however, the stages of production that relocate, and the speed of this relocation, have varied by industry. The following sections discuss how this trend has affected U.S. manufacturing, services, and R&D activity.

[107] For the concept of multinationals as manufacturing impresarios, see North, *Localizing Global Production*, 1997.

[108] Dunning and Lundan, *Multinational Enterprises and the Global Economy*, 2008, 260–94.

[109] Contractor and Lorange, "The Growth of Alliances in the Knowledge-Based Economy," 2002.

[110] Dedrick and Kraemer, "Offshoring and Outsourcing in the PC Industry," 2009.

[111] Grossman and Rossi-Hansberg, "Trading Tasks," 2008.

Relocation of tasks: Effects on U.S. manufacturing

U.S. companies have moved their manufacturing operations abroad to capitalize on differences in comparative advantage. Companies in developing countries have focused on particular labor-intensive tasks, such as final assembly of computers and telecommunications equipment, while the United States and other high-income countries have retained certain technology-intensive parts of the supply chain.

The speed of this reorganization has differed by industry. In electronics, productive tasks have been offshored relatively rapidly to low-wage locations such as China. The most dramatic shift has been in the production and assembly of computers. Production of computer peripherals, photographic equipment, and telecommunications equipment such as cell phones has also relocated to lower-income countries. However, the United States and other high-income countries have retained a large share of the production and export of such technology-intensive products as doped wafers[112] and machinery used in manufacturing semiconductors. Figure 3.3 shows the average income in countries exporting electronics products relative to incomes in the United States.[113] For example, the average per capita income of producers of semiconductors and integrated circuits is less than 40 percent of U.S. income. This indicates that producers of these goods earn wages below those prevailing in, say, Taiwan (which has roughly half the per capita income of the United States), but above those of China, Malaysia, or the Philippines (which have per capita incomes less than one-fifth of the U.S. level). The decline in relative wages between 1997 and 2006 has been particularly rapid in computers and computer peripherals, reflecting the rapid offshoring of production from high-income countries in these products.

The offshoring of activity in most other industries has not been as extensive, nor the changes as rapid, as in the electronics industry. Chemicals provides an example of an industry with more modest movements in supply chains (figure 3.4). A comparison of electronics and chemicals offshoring also shows that globalization does not affect the same stage of production in every industry. The United States retains substantial production of upstream inputs and machinery in the electronics sector, which require much more technology and skill to produce than more finished goods in the sector such as computers. In chemicals, high-income countries retain most of the production of final goods such as cosmetics and personal care items, which are the most technologically complex products in the sector. Meanwhile, upstream inputs are composed mostly of raw materials and basic organic compounds, and sourcing of these inputs has moved rapidly to low-income countries.

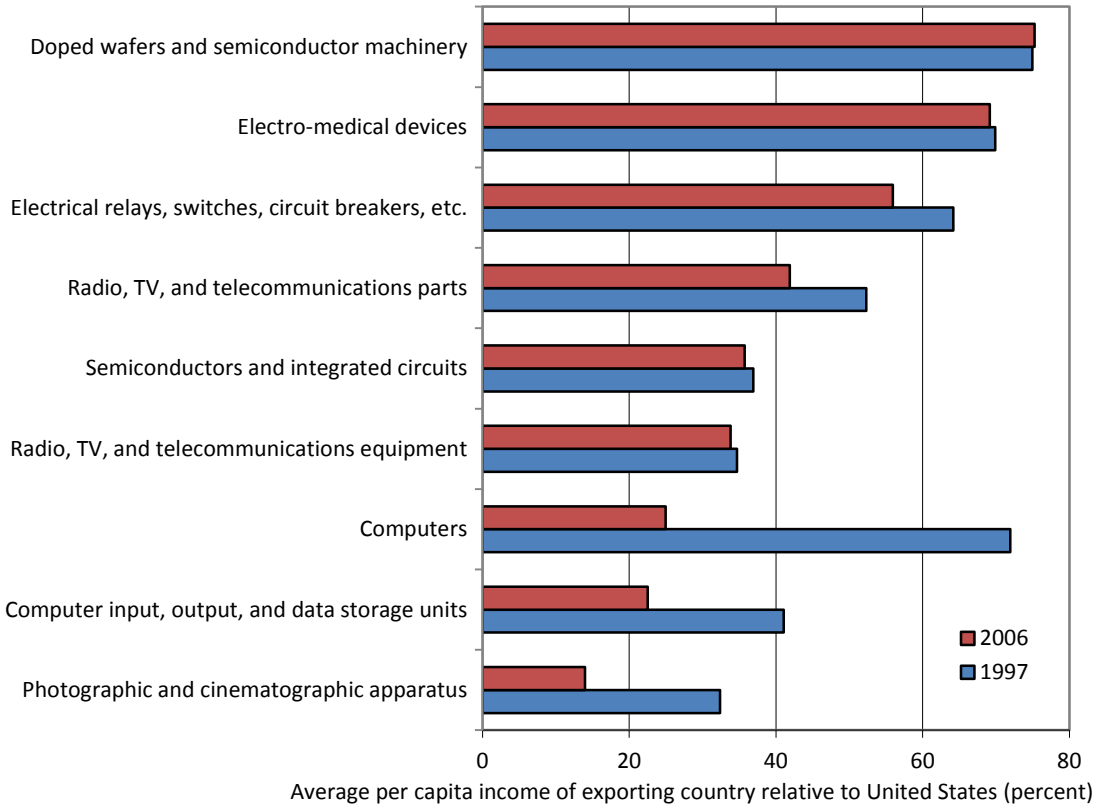
Relocation of tasks: Effects on U.S. services

Globalization has caused relocation of services activities as well as goods production. The reorganization of supply chains for services has led to both offshoring (foreign provision of services used to produce goods and services in the United States, resulting in

[112] Wafers are thin crystals of highly pure semiconductor material, usually silicon. They are doped by the deliberate introduction of impurities such as boron or antimony. The technology of this process is relatively more difficult than later stages of the assembly and testing of semiconductors.

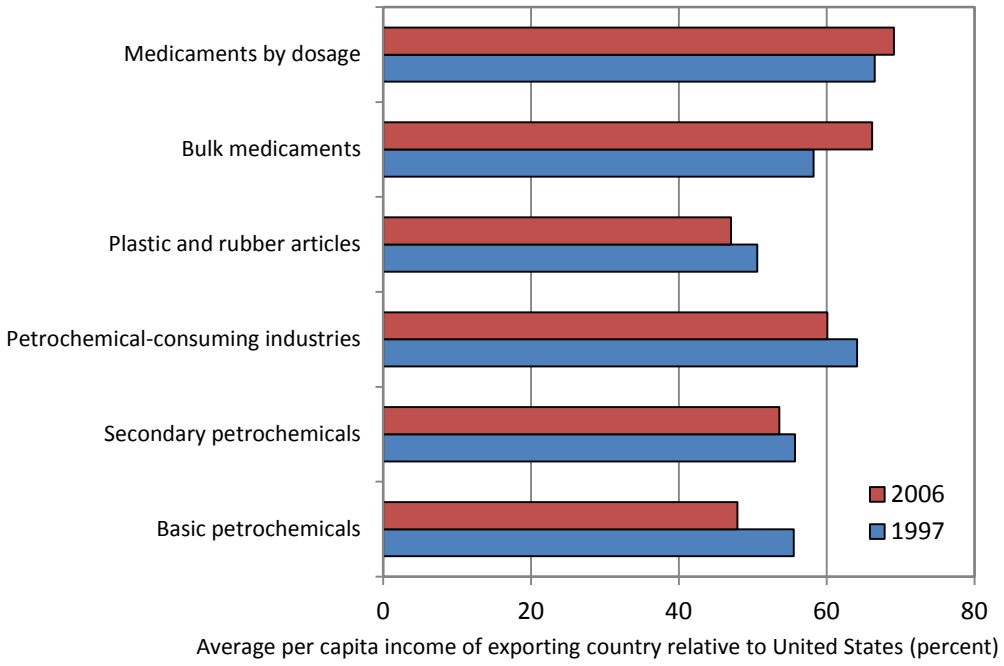
[113] The analysis in this section is based on Deason and Ferrantino, "Determinants of Diffusion and Downstreaming," 2009. This study looked at patterns of international trade in technology-intensive products for 15 countries making up the bulk of world trade in such products for the period 1997–2006.

FIGURE 3.3 Some electronics and related products have moved rapidly to low-income countries; others have not



Source: Deason and Ferrantino, "Determinants of Diffusion and Downstreaming," 2009.

FIGURE 3.4 Exports involving later stages of chemical processing are associated with higher income levels



Source: Deason and Ferrantino, "Determinants of Diffusion and Downstreaming," 2009.

U.S. services imports) and inshoring (U.S. provision of services to foreign producers, resulting in U.S. services exports). Firms in the United States specialize in many kinds of skilled labor-intensive services. Important components of the U.S. trade surplus in services include royalties and license fees; financial services; other business, professional, and technical services; and travel services. Firms around the world thus tend to source some of the skilled services they need in the United States. While some service activities, such as call centers, software design, and payroll processing, can be relocated to developing countries,[114] these remain the exception rather than the rule.[115] Consequently, for the United States, inshoring of services is a much larger phenomenon than offshoring. In 2009 the United States exported $484 billion of services and imported $335 billion, for a surplus of $149 billion. The 2009 surplus is more than double its 2003 level of $67 billion. During the same period, U.S. exports of business, professional, and technical services have grown by 85 percent, more rapidly than the 66 percent growth in U.S. exports of other services.[116]

Relocation of tasks: Effects on U.S. R&D

U.S. multinationals still perform most of their R&D activities at home; in 2007, for example, 85 percent of their R&D investment remained in the United States. Both economies of scale in R&D and the need to coordinate R&D with central headquarters management provide continuing incentives for firms to focus their R&D at home. However, it is becoming more common for U.S. firms to locate R&D outside the United States.[117] Although only 15 percent of U.S. multinationals' R&D investment went to their affiliates abroad in 2007, that share is up from 12 percent in 2001. Moreover, while most of the R&D carried out by U.S. affiliates occurs in other developed countries,[118] there have been a number of recent instances of U.S. firms increasing their R&D investment and employment in emerging markets, including Pfizer and Microsoft in China, Ford in Brazil, and Boeing in India.[119]

Multinationals' R&D in developing countries consists in large measure of adapting U.S. technologies. When multinationals use their foreign affiliates primarily for production and sales, as is common, it makes sense for their R&D in those countries to focus primarily on adapting technologies, processes, and strategies already developed in the United States to different local conditions.[120] The development of new technologies or management methods would require the affiliate to engage in a higher level of independent action than a typical affiliate focused on production and sales.[121]

[114] The United States is also a net importer of insurance services and computer and data processing services. See Gereffi and Fernandez-Stark, "The Offshore Services Value Chain," 2010, for more examples of services that have been offshored to developing countries.

[115] This characterization is based on both recent case studies and U.S. trade data.

[116] BEA data and Commission calculations.

[117] Gilman, "The New Geography of Global Innovation," 2010, 7.

[118] In 2008, 70 percent of the $37.0 billion of R&D performed by majority-owned U.S. affiliates abroad was located in Australia, Canada, the EU, and Japan. (BEA data and Commission calculations.)

[119] Gilman, "The New Geography of Global Innovation," 2010, 8, gives additional examples.

[120] Dunning and Lundan, *Multinational Enterprises and the Global Economy*, 370–1. See also USITC, hearing transcript, December 16, 2010, 131–2 (testimony of Kenneth Kraemer, professor, University of California, Irvine).

[121] Cantwell and Mudambi, "MNE Competence-Creating Subsidiary Mandates," 2005, 1109–28.

Effects on Consumers

Retailers are major users of advanced supply chain management techniques, and the efficiencies gained from the use of such techniques impact consumers directly. For example, the United States' largest retailer, Wal-Mart, has pioneered a variety of techniques to track products, manage warehouse inventories, and guarantee that orders from suppliers are quickly and accurately filled.[122] These practices are increasingly being adopted by other retailers around the country, and integrated with strategies for overseas sourcing. U.S. consumers have benefited both from the lower prices in today's better-managed superstores and from an increasingly wide variety of imported and domestic goods.[123] Better supply chain management also contributed to lowering the retail prices of apparel, electronics, hardware, recreational goods, and other items that are frequently imported.

In addition to lowering costs, the availability of a wider range of imported goods in the U.S. market has also benefited consumers in terms of increased product variety. The number of imported product varieties in the United States increased by a factor of four from 1972 to 2001.[124] The benefit to consumers of this increase in variety is estimated to be equivalent to a 1.2 percentage point annual drop in import prices, or 2.6 percent of GDP over the entire time period. While there are multiple factors affecting the supply of new imported varieties into the United States, including economic development in other countries, improvements in supply chain efficiency have also played a role. It has been estimated that trade facilitation measures in developing countries, which would enhance these countries' integration into supply chains by cutting red tape at the border, could dramatically expand the variety of products they export to developed countries.[125] Thus, there is scope for further improvements in supply chains in developing countries that could yield substantial benefits for consumers in the United States and other markets.

Effects on Employment and Wages

The effects of global supply chains on U.S. wages and employment are not well established in the economic literature, although empirical evidence suggests that effects vary by sector and by skill level of worker. Although studies suggest that, overall, U.S. workers are likely to benefit from global supply chains, there may be a negative effect on the relative wages of less-skilled workers. Offshoring low-skilled tasks to other countries has three potential effects on wages:[126]

[122] These techniques include continuous replenishment programs, vendor-managed inventory, and the use of radio frequency identification (RFID) technologies. See Lummus and Vokurka, "Defining Supply Chain Management," 1999; Angeles, "RFID Technologies," 2005.

[123] One study found that Wal-Mart sells identical food items at prices 15 to 25 percent lower than traditional supermarkets. Hausman and Leibtag, "CPI Bias from Supercenters," 2004.

[124] Broda and Weinstein, "Globalization and the Gains from Variety," 2006.

[125] Persson, "Trade Facilitation and the Extensive Margin," 2010. This study finds that if all countries were as efficient at the border as the most efficient country at the same level of development, the number of product varieties exported to the EU would increase by 64 percent for more differentiated products, such as high-end manufactured goods, and 29 percent for more uniform products such as agricultural goods.

[126] Grossman and Rossi-Hansberg, "Trading Tasks," 2008; Baldwin, "Integration of the North American Economy," 2009.

- First, there is a ***labor supply effect***, as low-skilled workers whose tasks have been offshored seek other jobs in the economy. This effect tends to push down the wages of less-skilled workers.[127]

- Second, offshoring can have a ***terms-of-trade effect***, which can raise or lower wages by changing the relative prices of U.S. imports and exports. If offshoring increases the world supply of a good or service that the U.S. exports, its price will tend to decrease, while a relative decrease in the world supply of a good or service will increase the U.S. export's price. If the price shift leads to a decrease in U.S. export prices relative to U.S. import prices, this would tend to lower U.S. wages, while if U.S. export prices increase in relative terms, workers would benefit.

- Third, there is a ***productivity effect***. When U.S. firms reduce costs by offshoring some tasks, the increased productivity could benefit all workers (both less-skilled and more-skilled) that remain employed. The widespread use of supply chains has generated economy-wide productivity gains, and thus potential increases in the wages of all kinds of workers.[128]

Studies conducted in the 1980s and 1990s often found at least some evidence for the labor supply effect. Increased imports of goods using less-skilled labor exerted downward pressure on the wages of less-skilled labor in the United States, though the effect of imports was often estimated to be modest compared to other factors affecting workers, such as technical change.[129] Since that time, global activities have been split into narrower tasks, and still more less-skilled activities have been sent to low-wage countries, while new high-skilled activities have migrated to the United States. Increased outsourcing can place additional downward pressure on the wages of less-skilled labor. One early study of this effect estimated that outsourcing accounted for 15 to 40 percent of the decline in the wages of production workers (such as assemblers, repair personnel, and maintenance workers) relative to nonproduction workers (such as managers, salespersons, and professionals) over 1979–90.[130]

The effect of global production fragmentation on wage inequality in the United States and elsewhere continues to be actively researched. Since the first intensive studies into the relationship between trade and wages in the 1990s, the share of U.S. imports from developing countries has expanded. One recent study, focusing on the impact of U.S. imports from China on U.S. local labor markets, found that increasing Chinese imports explain one-third of the aggregate decline in U.S. manufacturing employment between 1990 and 2007.[131] Another study found that average hourly compensation in the top 10 U.S. trading partners, weighted by trade, has fallen substantially: from 81 percent of the U.S. level in 1990, when China ranked 10th among U.S. trading partners, to 65 percent in

[127] This effect is not specific to supply chains—imports from developing countries could exert downward pressure on the wages of less-skilled workers in the United States, even in a world in which production fragmentation did not exist.

[128] Some work has questioned the extent to which these gains have been transmitted to workers and the broader economy, however. One study associated offshoring with an increase in the share of corporate profits in value-added and a decrease in the share of labor, and argued that increased profits from offshoring have been largely invested in financial assets, rather than in assets that are more likely to raise productivity and employment. Milberg and Winkler. "Financialisation and the Dynamics of Offshoring in the USA," 2010.

[129] USITC, *The Impact of Trade Agreements*, 2003.

[130] Feenstra and Hanson, "The Impact of Outsourcing," 1999. According to this study, the effect of advances in technology on wages is substantially greater than the effect of outsourcing. The study estimated that expenditures on computers, a measure of technology upgrading, accounted for 35 to 70 percent of the falling relative wage of production workers.

[131] Autor et al., "The China Syndrome," 2011.

2005, when China ranked 3rd.[132] This suggests at least the possibility that increasing production fragmentation in manufacturing may continue to place downward pressure on wages of less-skilled labor, and may also reduce employment of such workers. Future research may aid in disentangling the various ways in which global supply chains may have affected the structure of wages and employment in the U.S. economy and abroad. Box 3.5 discusses ways in which improved data could better show how participation in global chains affects the United States.

The effects of offshoring on U.S. manufacturing workers vary significantly for workers in different industries or occupations. Overall, U.S. multinationals tend to hire more workers in the United States when they are also expanding employment in high-income countries, and fewer U.S. workers when they are expanding employment in low-income countries in industries employing a high share of workers in routine occupations such as clerical work than in industries employing a high share of workers in nonroutine work such as management, communication, analytical reasoning, or skilled eye-hand coordination. Possibly as a result, workers in routine occupations experienced lower employment and wages when U.S. multinationals in their industries hired more workers in low-income countries, but higher employment and wages when U.S. multinationals in their industries hired more workers in high-income countries.[133]

Relatively few U.S. services jobs have been offshored so far. Researchers remain divided as to the potential effects of offshoring services on U.S. employment and wages, although the U.S. comparative advantage and trade surplus in services sectors are highlighted as reasons for positive effects on U.S. workers.

Some analysts believe the potential for future offshoring of such jobs is substantial. One study estimates that while the total number of U.S. services jobs offshored so far may be well less than a million, the total number of services jobs susceptible to offshoring is two to three times greater than the total number of manufacturing jobs.[134] However, another study argues that only "about one-third of tradable services activities are at risk of being offshored to low-wage labor-abundant countries like India and China," noting that the United States appears to have a comparative advantage in services and is a net exporter of services.[135] The same study noted that U.S. workers in tradable services sectors have more education and higher skill levels than in the lower-paying nontradable service sectors, and argued that the United States will likely gain good jobs in tradable services as services exports grow and become more integrated into global supply chains.[136] Other studies also question the calculations indicating that very large numbers of service jobs are offshorable, stating that they do not always consider the possibility of increased U.S. services exports to developing countries and, again, do not take into account the substantial U.S. trade surplus in services.[137]

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[132] Krugman, "Trade and Wages, Reconsidered," 2008.

[133] Ebenstein et al., "Estimating the Impact of Trade and Offshoring on American Workers," 2009.

[134] There were 14 million U.S. manufacturing jobs in 2006, the year the study was published. Blinder, "Offshoring," 2006.

[135] Jensen and Kletzer, "'Fear' and Offshoring," 2008. Jensen and Kletzer estimate that 15–20 million jobs are at risk with about half in the manufacturing sector, which has long been at risk.

[136] U.S. workers may also benefit from exports of skill-intensive services such as engineering, design, and architecture as demand in developing countries grows for improved infrastructure such as airports, sea ports, and large construction projects. USITC, hearing transcript, December 16, 2010, 74–76 (testimony of J. Bradford Jensen, associate professor, Georgetown University).

[137] Baldwin, "Integration of the North American Economy," 2009; Amiti and Wei, "Fear of Service Outsourcing," 2005.

BOX 3.5 Improved data would give a better picture of U.S. participation in global supply chains and its effects

There are several areas in which research into global supply chains could be enhanced by improved data and quantification. These include the tracking of intermediate goods and services trade on an industry-by-industry basis, the contribution of the logistics sector to economic activity, and the extent to which better global supply chain management has reduced transaction costs or may be expected to do so in the future.

In order to do the type of analysis of value added in U.S. trade presented earlier in this report it is necessary to have some idea of the amount of intermediate inputs used by particular U.S. industries that comes from specific exporting countries. At present there are no direct measures of such linkages, a lack that has been noted as a significant gap in available trade data.[a] Analyses of value-added trade must thus estimate these trade linkages, since they cannot be directly observed. Significant progress has been made in improving these estimates, but it is likely that they still fail to capture significant differences in the import sourcing patterns of different industries. Improvements in direct measurement of such linkages would help more precisely identify industry-specific connections to the global economy.

The contribution of the logistics industry to value chains is another area where improved data would further analysis. The activities of this industry generally do not appear as a coherent unit in statistical reporting systems but are broken up among a wide variety of areas, such as transport, warehousing, and business services. This reflects the industry's role in integrating a number of service sectors that used to be provided separately, or self-provided by manufacturing firms.[b]

Data on trade costs, by product and country, would help analysts estimate the effect of global supply chain management on these costs as well as assess its potential for reducing them further. Total trade costs include all transport and transaction costs linking the producer in the exporting country to the final consumer in the importing country. Some isolated estimates of total trade costs are available. For example, it has been estimated that the average retail markup for manufactured goods traded among developed countries is 170 percent, reflecting the difference between the price received by the producer in the exporting country and the retail price in the importing country.[c]

In a well-known example, the markup on Barbie dolls produced in China and sold in the United States is about 900 percent.[d] Case studies tracking price increases of particular products as they pass through global supply chains would be a useful first step in developing more comprehensive databases for the study of global trade costs.[e]

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[a]Feenstra et al., "Report on the State of Available Data," 2010, 5–8.
[b]USITC, *Logistic Services*, 2005, chap. 1.
[c]Anderson and van Wincoop, "Trade Costs," 2004.
[d]Feenstra, "Integration of Trade and Disintegration of Global Production in the Global Economy," 1998.
[e]Ferrantino, "Quantifying the Trade and Economic Effects of Non-Tariff Measures," 2006, 38–40.

In 2008, researchers examined the effects on U.S. workers of offshoring of services to China, as well as those of inshoring.[138] They found that small positive effects from inshoring outweighed smaller negative effects from offshoring, which were concentrated on less-skilled white collar workers.[139] On balance, according to this study, U.S. workers in occupations exposed to both offshoring and inshoring spent 0.1 percent less time unemployed, were 2 percent less likely to change occupations, and would earn 1.5 percent more than in the absence of such changes.[140]

Industry Case Studies

These case studies provide a detailed examination of the U.S. participation in three sectors in which U.S. trade and production have been substantially integrated into global supply chains. Supply chains in these industries differ considerably from one another, both in the activities performed by U.S. firms (figure 3.5) and the power that these firms have to set prices and other terms. In the first two case studies (apparel and motor vehicles), U.S. firms continue to hold dominant positions in supply chains, though they perform markedly different activities. In the third industry (televisions), the previous generation of dominant U.S. firms largely failed to transition to the world of global sourcing, though one U.S.-headquartered firm has grown to account for a substantial share of U.S. sales without being a dominant producer. Supply chains in these industries also differ considerably in their geographic extent and the factors important to their development. These characteristics are summarized below:

- **Apparel:** U.S. apparel firms engage in design, logistics, marketing, and sales activities. Almost all production is done abroad and, though they remain core activities of some U.S. firms, design and logistics are increasingly performed by foreign full-package suppliers as well. Asian countries have increasingly become the source of global apparel production, though U.S. firms continue to rely on suppliers in regions with U.S. FTAs and preferential trade agreements.

- **Motor vehicles and parts:** U.S. firms engage in nearly all supply chain activities, though specialized outside firms provide logistics and other services (except for financing). Auto manufacturers and their suppliers pursue a regional strategy, tailoring these activities to produce cars for local markets within regional supply chains. Europe, North America, and China are the major production locations.

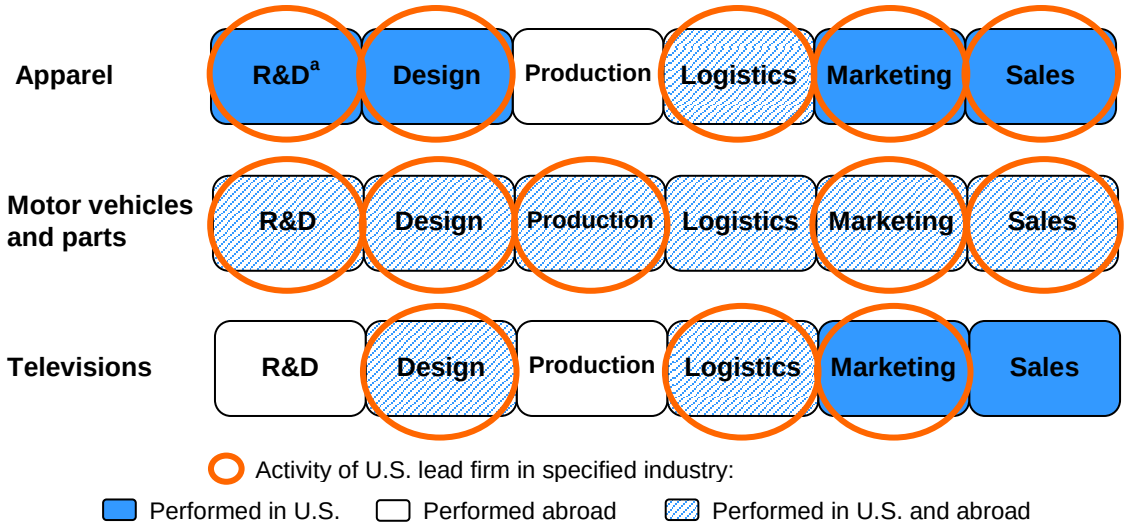
- **Televisions:** U.S. production of televisions ended in 2009, and only one company (Vizio) is headquartered in the United States. This company engages in some design, but mainly provides distribution, marketing, and sales support to U.S. retailers. Globally, Japanese and Korean companies produce the major television components, while assembly occurs in China and Mexico.

[138] Liu and Trefler, "Much Ado about Nothing," 2008, 1. This study defined offshoring as sales of U.S.-produced services to unaffiliated buyers abroad.

[139] Including workers in occupations such as sales and office and administrative support. Liu and Trefler, "Much Ado about Nothing," 2008, 32–34.

[140] Specifically, Liu and Trefler report estimated changes in unemployment duration, occupation switching, and wages for a scenario under which the rate of inshoring and offshoring in business, professional, and technical services grew at the same rate as that observed during 1996–2005 for the following nine-year period.

FIGURE 3.5 Major activities of U.S. lead firms in global supply chains, at home and abroad



Source: Commission compilations; apparel based on Gereffi and Frederick, "The Global Apparel Value Chain, Trade, and the Crisis," 2010.

[a]As noted in the apparel case study below, much of the R&D in the sector is provided by textile companies.

In addition to the three studies of industrial value chains, this section also examines the role of U.S. **logistics** firms. As noted earlier, logistics firms coordinate the movement of goods and services, an activity essential to the efficient operation of global supply chains. These firms have extended beyond the movement of freight, and now provide services such as customs brokerage, product repair, parts procurement, and distribution management. The case study discusses U.S. logistics providers' activities and global reach, and also presents examples of their integration into supply chains in industries such as electronics.

Apparel

Activities of U.S. Lead Firms at Home and Abroad

Like many other labor-intensive industries, the apparel supply chain for the U.S. market has evolved from one in which most activities took place in the United States to one with an increasingly global profile. Today, many of the early and especially late supply chain activities take place in the United States, but a large share of the intermediate steps, particularly apparel production, occur in one or more countries overseas. In large part reflecting this shift, U.S. apparel employment in the United States has dropped; in 2010, it was only 17 percent of its 1990 level.[141] Despite the fact that more supply chain activities are taking place offshore, much of the value and decision-making in the supply chain is still associated with the lead firms.[142] Such firms own the brands, and include mass market retailers (e.g., Wal-Mart and Macy's), specialty retailers (e.g., Gap and

[141] BLS, *Current Employment Statistics*, 1990–2009.

[142] Gereffi and Frederick, "The Global Apparel Value Chain, Trade, and the Crisis," 2010, 11–12; Nathan Associates Inc., "Exporting Apparel to the United States," 2009, 9–16.

Chico's FAS), and large apparel firms (e.g., VF Corporation, The Jones Group, and Hanesbrands).[143]

Figure 3.6 shows the basic steps of the global apparel supply chain (in blue). The top row indicates supply chain activities, which take products from research to sales. Most of the R&D takes place in the United States and abroad in the upstream product sectors—particularly in the development of new fibers, coatings, and fabric finishes—and so R&D is generally not included with the activities of apparel firms.[144] The bars below the supply chain illustrate three simplified examples of lead firm involvement (shown in green) in the global apparel supply chain. In all three examples, the lead firms are heavily involved in the branding and marketing of products (shown on the right side of the diagram). Although the lead firms typically employ several different combinations of supply chain sourcing, the trend has been to outsource more and more steps in the supply chain. As lead firms look for avenues to improve their competitiveness, many have shifted some or most of the supply functions offshore to other firms to manage for them.

In example 1, apparel firms control most or all of the activities in the global supply chain, from design through marketing. These firms own their own brands, design their products, select their raw materials, and maintain control of their production networks. They either own the production facilities themselves or supply the fabrics to a contractor who cuts the fabric, makes (sews) the garment, and trims it (trims the thread and packages the garment)—a process collectively known as cut, make, trim (CMT). This was a common form of apparel sourcing when domestic apparel manufacturing firms initially started moving production offshore to seek lower labor costs. Today, however, this is the least common form of sourcing for U.S. lead firms, although some U.S. apparel firms (e.g., Hanesbrands and VF Corporation) still operate at least part of their supply chain using this model, particularly for apparel manufactured in the CAFTA-DR region.[145]

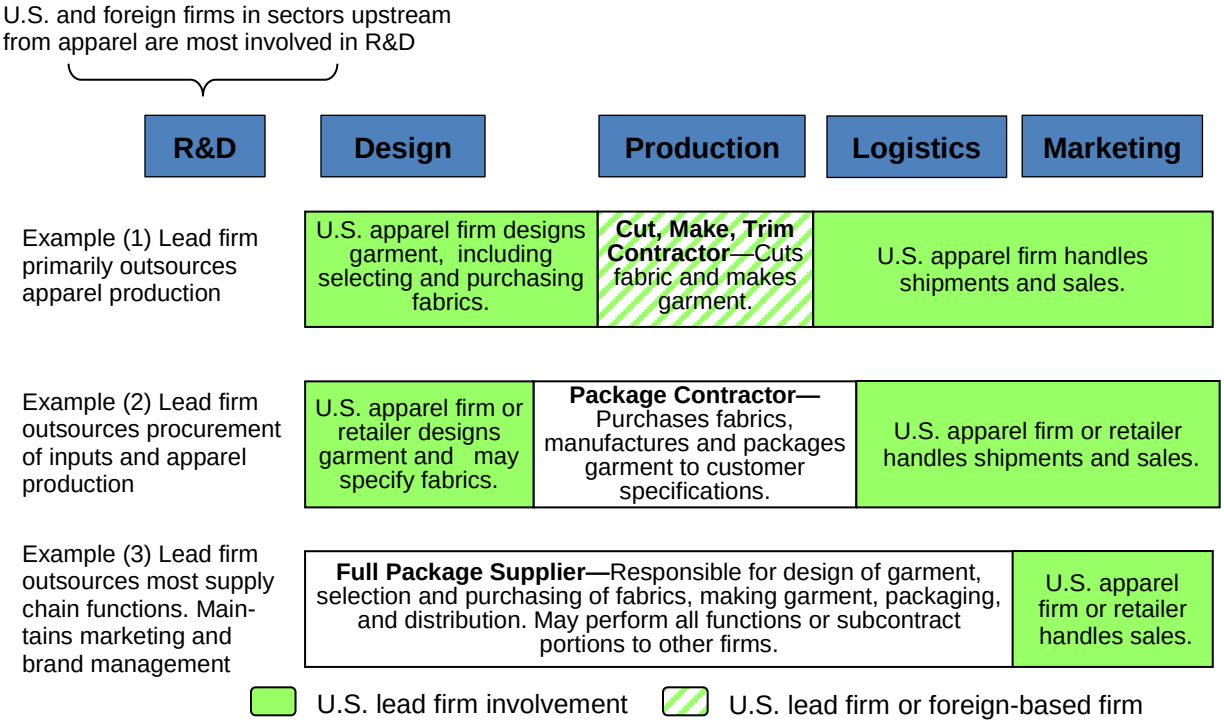
In example 2, the U.S. lead firm designs the product, but outsources the procurement of raw materials and the manufacturing of the garment to a "package contractor." The logistics and financing involved in procuring fabrics and other raw materials is shifted from the lead firm to the package contractor. Under this example, production also likely takes place offshore. Some lead firms have also moved their sourcing offices closer to their main apparel suppliers (mainly Asia), and some have moved the design process and materials selection offshore as well, though not to different companies.

[143] Mass market retailers sell apparel under their own private-label brands, as well as international branded apparel. Specialty retailers sell apparel exclusively under their own brand names. The large apparel firms each control several different brands, and many have also entered the retail sector with their own specialty retail stores (e.g., Levi Strauss, Polo Ralph Lauren, and Nike).

[144] Examples of U.S. firms involved in such R&D include Invista (a subsidiary of Koch Industries, Inc.), International Textile Group, and Polartec. These firms have developed intermediate branded products that are inputs to apparel articles (e.g., fibers, fabrics, and finishes). For the purposes of this discussion, design of the garment is treated separately from R&D. Nevertheless, apparel firms are sometimes involved in R&D. For example, apparel firms making clothing for extreme weather or physical activities will likely go beyond design for an average garment and be involved in developing and testing the garment for specific applications. Apparel firms may also work with textile firms in the development of applications for new fibers, fabrics, and finishes.

[145] VF Corporation, for example, states on its Web site that it manufactures products in its own or contract facilities in Nicaragua, Honduras, and Mexico, though it has extensive operations elsewhere. It also states that it oversees production at more than 1,400 owned or sourced facilities around the world. VF Corporation Web site, http://www.vfc.com/about/global-presence (accessed February 24, 2011); Gereffi and Frederick, "The Global Apparel Value Chain, Trade, and the Crisis," 2010, 16.

FIGURE 3.6 Apparel global supply chain: Selected examples



Source: Commission compilation based on Gereffi and Frederick, "The Global Apparel Value Chain, Trade, and the Crisis," 2010, and industry sources.

In example 3, most of the steps in the supply chain are undertaken offshore, including design, production, and logistics. The lead firm relies on a full-package supplier to perform all the elements of the supply chain except marketing and perhaps shipping.[146] Some of the larger full-package suppliers have factories located around the world, which allows them to offer lead firms a greater diversity of products as well as more options to balance costs, lead times, and order quantities.

In addition to working directly with package contractors or full-package suppliers, large U.S. apparel companies and retailers are increasingly working with intermediary sourcing agents who provide a link between themselves and the manufacturer. In the case of examples 2 and 3 in figure 3.3 above, the sourcing agent assumes the responsibilities of the foreign manufacturer (shown in white). The sourcing agents may perform some of the functions themselves (such as raw materials selection), but generally source the production of the garment itself to another firm. Since sourcing agents often have access to a large network of fabric suppliers and apparel manufacturers around the world, they can also help retailers and apparel firms have more flexibility about order quantities and lead times, as well as save on costs.

Li & Fung Limited, based in Hong Kong, is an example of a large sourcing firm that offers a wide range of services to lead firms, including product design and development, raw material sourcing, factory sourcing (for production of the apparel articles), and logistics. In 2010, Wal-Mart signed a non-exclusive strategic alliance with Li & Fung for

[146] Sometimes the full package supplier will ship the goods directly to the lead firm's distribution center or even its customer. However, U.S. lead firms may also arrange for their own shipping from the factory or port, particularly if they have negotiated good rates with the shipping firms.

sourcing some of its goods, including apparel items.[147] Liz Claiborne also has a sourcing agreement with Li & Fung that provides everything except design and marketing.[148]

Important Drivers Affecting U.S. Participation

One of the most important drivers shaping U.S. participation in the global apparel supply chain in recent years has been the expiration in 2005 of U.S. and EU textile and apparel import quotas under the WTO Agreement on Textiles and Clothing (ATC).[149] Because the quotas no longer limited quantities that could be obtained from a single country, U.S. retailers and apparel companies consolidated their supply bases and developed new supply chains to reduce lead times and costs.[150] At the same time, there was extensive consolidation in the retail and branded sectors: the number of department store chains in the United States dropped from 50 in 1990 to 17 in 2008.[151] This trend has greatly expanded U.S. lead firms' purchasing power.[152] Since 2004, the year before the ATC expired, the consumer price index (CPI) for apparel has remained relatively flat; it actually declined 0.7 percent between 2004 and 2010, whereas the CPI for all products increased by 15.5 percent during the same period.[153]

Although the quotas are gone, the rules of origin under U.S. FTAs and preferential trade arrangements have also influenced U.S. firms' involvement in global apparel supply chains. For example, the rules of origin for most apparel under NAFTA and CAFTA-DR require the apparel to be made from yarns and fabrics produced in the United States or an FTA partner country for it to enter the United States duty free. In 2010, these FTA partner countries accounted for 72 percent of the value of U.S. yarn and fabric exports.[154] Nevertheless, U.S. yarn and fabric exports to these countries have declined in recent years—down by 15 percent from 2004 levels—in part because U.S. lead firms have shifted their sourcing strategies (box 3.6). Asian manufacturers have been able to provide more services at overall lower costs, despite having to pay tariffs on imported goods (as in examples 2 and 3).

In addition, U.S. retailers and branded apparel firms are looking to expand their global presence by opening new retail outlets and/or selling their merchandise in established

[147] Just-Style.com, "Wal-Mart Deal 'tip of the iceberg' for Li & Fung," February 1, 2010; Walmart, "Walmart Leverages Global Scale to Lower Costs," news release, January 28, 2010 (accessed February 28, 2011).

[148] Einhorn, "Li & Fung: A Factory Source Shines," May 14, 2009; Li & Fung Limited, "Liz Claiborne Inc. and Li & Fung," news release, February 23, 2009 (accessed February 28, 2011).

[149] The ATC entered into force in 1995 and mandated the gradual elimination of quotas that had been in place under the Multifiber Arrangement (MFA) since the 1970s. All MFA quotas were eliminated after a 10-year transition period that ended on January 1, 2005. Some quantitative restraints on Chinese apparel remained in place after this date, as permitted under the China WTO accession protocol. These safeguard quotas were also eliminated by the end of 2008. USITC, *Import Restraints, Fifth Update 2007*, 2007, 58–62.

[150] USA-ITA, written submission to the USITC, January 6, 2011.

[151] Barrie, "Brand Bias Drives New Retail Strategies," April 17, 2008.

[152] David Birnbaum described the increase in power as an "oligopsony where a small number of customers control entire retail markets." Birnbaum, "Comment: The Changing Value of the Garment Worker," October 18, 2010.

[153] Based on BLS, "Consumer Price Index for All Urban Consumers," 2004, 2006, 2008, and 2010.

[154] Based on exports under NAICS code 313 (textile mills) from USITC DataWeb/USDOC (accessed March 3, 2011).

BOX 3.6 Recent shifts in sources of global value in textiles and apparel

As reported earlier in chapter 3, China's share of the valued added in U.S. apparel imports was 11 percent in 2004 (table 3.3), but it is likely that China's share has increased significantly since then. China's share of total U.S. apparel imports has more than doubled since 2004, growing from 19 percent in 2004 to 41 percent in 2010. China is also a large supplier of textile inputs to other major Asian apparel-producing countries, such as Vietnam, which also ship large quantities of apparel to the United States. Recent reports reveal, however, that some U.S. apparel firms and retailers are starting to move some of their apparel sourcing back to the Western Hemisphere to help diversify their supply base and minimize their risk, such as unexpected delivery delays.[a]

[a]Freeman, "Apparel Firms Eye Central America Sourcing," March 24, 2011.

retail outlets in international markets.[155] Using full package suppliers (example 3) and/or sourcing agents gives branded apparel firms and retailers greater flexibility in supplying different markets, for more cost-effective results. For example, such arrangements may offer U.S. retailers and apparel firms access to a wider selection of fabrics and manufacturing bases, as well as duty-free access to certain markets under other countries' bilateral or regional trade agreements and preferential trade arrangements.[156]

Most recently, another driver affecting U.S. participation in the global supply chain has been shrinking consumer expenditures on apparel. During 2007–09, average annual consumer expenditures on apparel declined by 8 percent,[157] putting added pressure on retailers to cut costs and minimize excess inventory. In response, retailers have shifted additional sourcing functions offshore to other firms, allowing lead firms to reduce lead times while ordering fewer garments in greater assortments.

Autos and Parts

The motor vehicle industry[158] manages a large, diversified set of suppliers in nearly every region of the world, making for a complex supply chain with global, regional, and local characteristics. Although a completely global car or platform is an attractive concept to automakers because of the potential for scale economies and reduced design and engineering costs, the most prevalent manufacturing strategy employs a regional supply chain. With this approach, automakers and suppliers are better able to meet local pricing and consumer preferences, reduce inventory costs, and manage currency fluctuations. Motor vehicle companies perform nearly all supply chain activities within these regions, with the exception of logistics services, which are largely provided by specialized firms.

[155] For example, VF Corporation, which describes itself as world's largest apparel company, states that its brands are sold in 150 countries through 47,000 retailers. VF Corporation Web site. http://www.vfc.com/about/global-presence (accessed February 24, 2011). See also Driscoll, *Standard & Poor's Industry Surveys*, 6; Just-Style.com, "US: Aeropostale Inks Deal to Expand into Asia," March 9, 2011; Juststyle.com, "US: A&F to Expand Global Reach," February 17, 2011.

[156] For example, access to the Japanese market under the Association of Southeast Asian Nations-Japan FTA. USITC, *ASEAN: Regional Trends in Economic Integrations*, 2010, 4-10 to 4-11.

[157] BLS, *Consumer Expenditures–2009*, October 5, 2010, 1, table A.

[158] The motor vehicle industry includes firms that assemble vehicles, such as passenger cars and light trucks, as well as those that produce vehicle components, such as gearboxes and braking systems.

Regional Manufacturing Approach

Regional manufacturing is common to most of the world's leading automakers and to tier one (large multinational) parts makers,[159] including those in the United States. These firms manufacture vehicles and parts throughout the world, and although they are considered global in terms of their footprint and reach, they typically organize their manufacturing activities within high-demand regions, such as Europe, North America, and China.[160] The level of demand in these regions is high enough to support volume production of vehicles and parts, a leading prerequisite for firms when deciding where to locate manufacturing. Countries within these regions also share certain common features, such as regionwide safety standards in Europe, which make local production more attractive. Taken in combination, these factors often encourage vehicle and parts makers to establish regional or local R&D and design centers to tailor vehicles and components to local preferences, standards, and pricing and technology levels, although global headquarters may remain in the home country. Logistics services for the industry, on the other hand, are usually handled by globally established firms with local operations and specialized expertise.[161]

The NAFTA region is a notable example of regional automotive industry integration. Regional integration began in the mid-1960s, when the Automotive Products Trade Agreement between the United States and Canada eliminated tariffs on imports of motor vehicles and parts between the two countries. This agreement is considered by some to be the initial model for regional integration in the motor vehicle industry. North American integration took an additional step with the ratification of NAFTA, drawing Mexico further into the regional automotive industry. For example, automakers Ford, General Motors, Chrysler, and Toyota manufacture in all three NAFTA countries, as do tier one suppliers such as Visteon (United States) and Denso (Japan).

As noted in the section on U.S. supply chain participation earlier in this chapter, U.S. imports in the motor vehicles and parts sector have a substantial share of value (19.1 percent) that consists of U.S. value returned home from abroad. This largely represents U.S. value returned home from NAFTA member countries, as the U.S. industry sources heavily from the region's supply chains. In terms of value added, North American sources account for 72 percent of the content of the U.S. motor vehicles and parts sector.

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[159] Motor vehicle parts makers are commonly referenced by their position in a particular industry "tier." Tier one producers are generally large multinationals that supply components, systems, and modules directly to automakers. These firms may also undertake supply chain management, systems integration, foreign investment, and extensive design and R&D. Tier two and tier three suppliers, which number in the tens of thousands, are generally smaller in size and product/function scope and are less likely to have the financial resources and customer base to support significant foreign investment. Tier two suppliers generally provide parts and materials to tier one producers, whereas tier three suppliers often provide raw materials or parts to a wide variety of industries, including the motor vehicle sector.

[160] Sturgeon et al., "Value Chains, Networks, and Clusters," 2008, 9.

[161] Logistics activities in the automotive supply chain are often complex. A single automaker, for example, may source from a global supply base of over 10,000 firms. Deloitte Research and Stanford Global Supply Chain Management Forum, *Integrating Demand and Supply Chains*, 2009, 10. Logistics firms not only transport, warehouse, and inventory parts and vehicles, but they also perform other services, such as sequencing and assembly of parts at vehicle assembly plants. With sequencing, the firms deliver the parts or systems to the automaker in the order in which assembly occurs as part of the just-in-time inventory process. Team 3 Logistics, for example, indicates that it provides services such as materials procurement, warehousing, inventory control, sequencing and kitting of parts, and forwarding. Team 3 Logistics Web site, http://www.team3logistics.com/services.html (accessed March 7, 2011).

Regional Structure Factors

Market factors

Because different motor vehicle markets often have different requirements, automakers and their suppliers often find that regional production best enables them to satisfy these criteria. For example, the type of vehicles demanded in a given region may be determined by income, vehicle standards and regulations (e.g., emissions and safety), consumer preferences, and driving conditions.[162] A regional strategy allows automakers and their suppliers to offer vehicles that meet local price ranges and are tailored to the market, often while employing just-in-time inventory practices. Transportation costs, although important, appear to be less of a contributing factor in the development of regional production arrangements for higher-value goods such as motor vehicles. Automakers also control retailing in local operations to manage vehicle sales and provide aftermarket support.

Government policies

Several types of government policies have influenced the manufacturing structure of the automotive industry, with local-content requirements being the most notable. These requirements mandate that a specific share of a locally assembled vehicle's value must come from locally produced components for the vehicle to benefit from certain incentives, such as reduced tariffs. These policies have been a significant growth driver for regional motor vehicle and parts production. By stipulating a designated content level, governments aim to develop their domestic industry, increase local production, and encourage foreign suppliers to form joint ventures or set up shop locally to supply their automotive customers.[163] The industries in China, Thailand, Australia, and Indonesia, for example, have at various times been subject to these requirements.

Beyond local-content requirements, political considerations also weigh into decisions to produce and source locally. The automotive industry is often a leading source of economic growth for countries or regions, and may be supported to some degree by national governments. Political pressure on automakers and their suppliers to establish or retain local production facilities has also contributed to this regional production pattern.[164]

Regional trade arrangements, such as NAFTA and the Association of Southeast Asian Nations (ASEAN), provide trade and investment preferences to member countries, which may serve as a lure for foreign investment from manufacturers that want to benefit from those policies. Automakers also use regional production to cushion the effects of currency fluctuations.[165] By spreading production in different regions, automakers and suppliers try to lessen the financial impact of a strong (or weak) home currency.

Supply chain relationships between automakers and suppliers

The supply chain activities undertaken by the motor vehicle industry are less concentrated globally than those of other industries, as motor vehicle companies perform many supply chain activities in all regions. In fact, automakers and component manufacturers perform several of the same functions on a regional basis. R&D and

[162] Humphrey and Memedovic, "The Global Automotive Industry Value Chain," 2003, 18.
[163] Ibid., 19.
[164] Sturgeon et al., "Value Chains, Networks, and Clusters," 2008, 9.
[165] Kitamura, "Toyota President Says He May Move More Production," January 14, 2011.

design work are performed by both automakers (vehicles) and suppliers (parts). They work closely together to ensure vehicle fit and finish, quality, and safety. Automakers procure most parts from suppliers, but generally retain manufacture of signature systems—typically, engines and transmissions.[166] This supply chain approach allows automakers to lower costs by taking advantage of parts suppliers with their own core competencies, product expertise, and volume production.[167] Honda, for example, reportedly relies on suppliers for more than 80 percent of the components for its passenger cars, with in-house production focused on engines, transmissions, and bulky, capital-intensive parts such as stampings.[168]

Leading parts suppliers are often expected to invest globally to supply their auto customers, and they may also manage the upstream supply chain (tier two and three suppliers).[169] In a recent survey of automotive suppliers, 52 percent of tier one respondents indicated that their customers exerted pressure on them to manufacture nearby.[170] Suppliers for both Toyota and Honda, for example, followed their automotive customers to the United States to supply their U.S.-based vehicle assembly facilities. These suppliers include Denso Corp., Nippon Seiki Co., and Stanley Electric Co.[171] A similar movement has occurred as U.S. automakers moved into China, where 26 percent of China's parts producers are reportedly owned by U.S. suppliers.[172]

With respect to vehicle sales outlets, automakers typically control operations. In the United States, for example, automakers contract with one or more franchise dealers to represent their vehicles. The automakers then provide financing for dealerships to purchase vehicles (called floorplan financing) and also offer an avenue for customer financing (dealer-arranged financing). The dealer, however, takes on most of the investment risk in providing dealership services.[173]

Televisions

The U.S. supply chain for televisions, like that of many other products in the electronics sector, has migrated from a pattern in which a high concentration of activities, including production, occurs in the United States to one in which production is exclusively offshore. Unlike some other U.S. consumer electronics firms, however, U.S. television producers failed to adapt swiftly enough to technological change and lost their former position as global industry leaders. In 2011, U.S. supply chain activity by the sole remaining U.S. firm is limited to design, marketing, and to a lesser extent, logistics (figure 3.5).

While the United States developed color televisions, and was a significant producer of televisions for decades, U.S. production ended in 2009.[174] The primary factors contributing to the loss of U.S. production were superior technology and marketing strategies employed by Japanese firms;[175] competitive, and in some cases, unfair pricing

[166] One industry source estimates that automakers add less than 25 percent to a vehicle's value, with the remainder (over 75 percent) added by suppliers. A.T. Kearney, "Automotive Suppliers: Management Strategies & Value Enhancement" (accessed April 1, 2011).
[167] Furtado and Andrade, "Outsourcing In Different Production Models," 2005, 2.
[168] SupplierBusiness Ltd., "Honda Purchasing Strategy and Relationship with Suppliers," 2009, 21.
[169] See, for example, Sedgwick, "Toyota Expects Tier 1s to Check on Subsuppliers," January 17, 2011.
[170] KPMG International, "Global Location Strategy for Automotive Suppliers," 2009, 10.
[171] SupplierBusiness, Ltd., "Honda Purchasing Strategy and Relationship with Suppliers," 2009, 21.
[172] KPMG International, "Global Location Strategy for Automotive Suppliers," 2009, 11.
[173] Canis and Platzer, "U.S. Motor Vehicle Industry Restructuring and Dealership Terminations," 2009.
[174] Zacks Investment Service, "Sony Partially Exits LCD Plant," 2010.
[175] Hart, "The Consumer-Electronics Industry in the United States," 1991.

of televisions and parts over a period extending back into the 1960s by producers in China, Korea, Japan, and Taiwan;[176] and, more recently, the shift in display technology from cathode ray tubes (CRTs) to flat panel displays (FPDs) such as liquid crystal and plasma displays.[177] Rules of origin provisions for CRTs under NAFTA were unsuccessful in maintaining U.S. production and jobs after the industry switched to FPDs.

Global Supply Chains for Televisions

There are two key components for FPD televisions, the display panel and the chipset, which together account for 94 percent of the costs.[178] The global supply chain for FPD televisions uses glass produced in Japan and Korea; displays incorporating the glass, assembled in Japan, Korea, and Taiwan; and semiconductor chip sets designed in the United States and elsewhere and produced in China, Korea, Singapore, and Taiwan. Assembly occurs principally in China, the world's largest television producer, although most sets destined for the U.S. market are assembled in Mexico.[179] These sourcing patterns are consistent with tables 3.2 to 3.5 above, which illustrate the significant value added by East Asia, Japan, and China in U.S. imports of electronic equipment.

An investment in the hundreds of millions of dollars is required to be in the vanguard of glass production for FPD televisions.[180] The need for such investment has led to collaboration by multinational corporations. The biggest investment for production is in the tooling to produce the glass for the displays, followed by the production of the display itself, and then by the assembly into the finished consumer good. Investments in FPD technology have been concentrated in Asia, reflecting Asia's increasing importance as a global production center for televisions and other electronics.

U.S. Participation in the Global Supply Chain

U.S. participation in the global supply chain is now limited to the design of chips, some product development, distribution, marketing, and customer service. The last U.S. television factory (owned by Sony) closed in 2009. All televisions sold in the United States now are imported from original equipment manufacturers (OEMs)[181] with factories outside the United States (principally in Mexico) or from contract manufacturers with factories principally in Mexico and China.[182]

The sole remaining U.S.-headquartered television brand, Vizio, entered the U.S. market in 2002. Vizio has no factories of its own, but rather uses contract manufacturers in

[176] For example, see USITC, *Certain Color Television Receivers from China*, May 2004; USITC, *Television Receiving Sets from Japan*, June 1981; U.S. Tariff Commission, *Television Receiving Sets from Japan*, March 1971.

[177] FPD technology was largely developed in American laboratories. However, U.S. companies capable of manufacturing FPDs either decided not to do so or were unable to obtain funding for their efforts. U.S. Congress, Office of Technology Assessment, *Flat Panel Displays in Perspective*, 1995.

[178] Palepu and Kind, "Vizio Inc.," 2009, 7.

[179] China Economic Net, "3D TV Sets Booming in China" (accessed May 18, 2011).

[180] Corning Display Technologies, "Corning Announces Investment in Gen 10 LCD Glass Substrates," December 5, 2007.

[181] An OEM is an organization that makes the products it sells under its own brand name or buys products and resells them under its own brand name. The OEM typically designs the product and owns the intellectual property for the product, which is made to order. A contract manufacturer is an organization that makes products under contract for resale by the OEM, using the OEM's design.

[182] In 2010, Mexico and China accounted for 70 percent and 29 percent, respectively, of the value of U.S. imports of televisions.

China, Taiwan, and Mexico to produce goods to Vizio's specifications.[183] Although Vizio builds products that incorporate current technology, it does no R&D; instead, it purchases patents or licenses the technology from other patent owners. Vizio has also acquired other patents, which it licenses to other television manufacturers.[184] The principal suppliers of finished televisions to Vizio are two contract manufacturers in Taiwan, Foxconn and Amtran. These companies are also part owners of Vizio.[185]

Policies and Institutions That Affected the U.S. Industry

Most of U.S. television production, which then used CRT technology, gradually moved to Mexico in the late 1990s. NAFTA included provisions that allowed televisions to enter the United States duty free if specific rules of origin were followed. These rules required that either of the two major glass parts of a tube be of North American origin for NAFTA origin to be conferred on the finished tube.[186] In addition, the rules of origin for televisions virtually required the inclusion of a picture tube of NAFTA origin in order for NAFTA origin to be conferred on the television itself. Because of the sizable U.S. investment in tube and glass factories, those goods continued to be produced in the United States for some time even after CRT-based television assembly moved to Mexico. However, new display technology made those NAFTA provisions irrelevant when FPDs became affordable alternatives to CRTs in televisions.[187] In addition to being price-competitive, televisions incorporating FPDs could have much larger screens than televisions incorporating CRTs, take up less space, consume less energy, and be more easily moved around. The switch to FPDs accelerated in 2009, when the United States adopted a digital broadcast standard such that signals could only be received by televisions incorporating a digital tuner or connected to a digital-to-analog converter. As consumers bought new televisions with digital tuners, many opted to buy televisions with FPDs rather than CRTs. As a result, demand for CRT-type sets (which constituted the majority of U.S. production) fell and production in the United States declined, from $4.0 billion in 2000 to $127 million in 2009.[188] The value of imports grew as demand for televisions with FPDs grew, from $245 million (4 percent of the value of television imports in 2001) to $19.2 billion in 2010, or 100 percent of the value of imports.

Although the North American industry producing televisions with FPDs survives, in part the result of NAFTA rules of origin, the largest part of what survives is in Mexico, and consists of assembling mostly imported components of Asian origin. Like contract manufacturers in China, the factories in Mexico (some of which are themselves contract manufacturers) take advantage of lower labor costs. Meanwhile, some higher-value activities (such as R&D) occur overseas, while others (including design and marketing) remain in either the country where headquarters are housed or the United States.

[183] Vizio also markets other consumer electronic products, including Blu-ray players and home theater systems.

[184] Vizio, "Sony, Vizio Reach DTV Patent Agreements," 2009.

[185] As of 2008, Amtran reportedly owned 23 percent of Vizio. Flannery, "Vizio's Flat-Screen Burst," 2008.

[186] North American Free Trade Agreement, Annex 401; Jensen-Moran, "Trade Battles as Investment Wars," 1996.

[187] Although liquid crystal display displays were invented in the United States, there has been only limited commercial production of such displays in the United States.

[188] U.S. Census Bureau, Annual Survey of Manufactures, various years.

Effects on U.S. Companies and Employment

The number of companies producing televisions in the United States declined from seven in 2003[189] to one in 2009, which closed its plant that year. U.S. television production declined as manufacturers (mostly headquartered in Japan) moved U.S. production to Mexico, which had lower-cost labor.[190] In 2010, Vizio had 196 employees, with 76 in South Dakota, 3 outside the United States, and the remainder in California. None of the Vizio employees, however, either in the United States or elsewhere, would be considered production workers.

Logistics

U.S. firms are among the leading logistics providers worldwide and hence have become essential participants in global supply chains.[191] Logistics, the coordinated movement of goods and services, encompasses diverse activities that oversee the end-to-end transport of raw, intermediate, and final goods between suppliers, producers, and consumers.[192] As noted above, improvements in logistics services—both in-house and third-party—have promoted the growth of global supply chains.[193] Manufacturing firms, for example, increasingly outsource certain logistics activities to third-party logistics service providers (3PLs) in order to focus on their core competencies and avoid or minimize the costs of developing in-house logistics capacity (table 3.6).[194]

The ability of firms to move materials faster and over greater distances has become key, if not critical, to maintaining competitive advantage.[195] New sourcing arrangements with 3PLs help manufacturers achieve these goals. As discussed below, the benefits of integrating fully with 3PLs often exceed what those companies could obtain under traditional contractual arrangements where the 3PL performs discrete functions, but has limited knowledge of a company's internal operations.[196] In addition, where companies' sourcing, production, and distribution activities are spread across multiple countries, procuring services from 3PLs permits the manufacturers to take advantage of the 3PLs' transportation and supply chain networks.[197]

Leading Logistics Firms

The largest and most diversified U.S. logistics firms are FedEx and UPS, although for both firms, primary revenues are derived from the express delivery of letters and small

[189] USITC, *Certain Color Television Receivers from China*, May 2004.
[190] Contreras and Carrillo, "E-commerce and Regional Integration," July 2002.
[191] Mullen, written testimony to the USITC, December 16, 2010.
[192] Logistics most commonly include freight forwarding; multimodal transport (i.e., transport by air, ship, truck, or rail); warehousing and storage; tracking; and customs brokerage. They may also encompass other services such as order fulfillment, product repair, and supply chain management. Supply chain management refers to the design and management of transportation and distribution networks. Along with goods, certain services may also be transported by logistics firms, for example, in the forms of architectural plans, legal briefs, and franchising materials. USITC, *Logistic Services: An Overview*, May 2005, 2-1.
[193] Mullen, written testimony to the USITC, December 16, 2010.
[194] Bolumole, "The Supply Chain Role of Third-Party Logistics Providers," 2001, 90.
[195] Bhatnagar and Viswanathan, "Re-engineering Global Supply Chains," 2000, 13–34.
[196] Global 3PLs have developed areas of competency that are based on the industries of their largest customers, including, for example, healthcare and high-tech manufacturing. As 3PL firms accumulate knowledge of these industries, they can more effectively serve their customers. See, for example, UPS, "Industry Solutions" (accessed March 16, 2011).
[197] Bhatnagar and Viswanathan, "Re-engineering Global Supply Chains," 2000, 22–27.

TABLE 3.6 Examples of services supplied by U.S. 3PL firms to global clients

U.S. 3PL firm	Client and industry	Services	Location(s) served
Caterpillar Logistics	Caterpillar, heavy equipment	Warehousing and distribution	Dubai
FedEx	Philips Semiconductor, high-tech equipment	Transportation, warehousing and distribution, customs brokerage	United States and Asia
Menlo Worldwide	Maastricht, high-tech equipment	Warehousing and distribution for service parts	Europe, Russia, the Middle East, and Africa
Penske Logistics	General Motors, automotive	Transportation, distribution, supply chain management	Mexico
Penske Logistics	Continental Tire, transportation equipment	Warehousing and distribution, customs brokerage	China
Ryder	Boeing, aerospace	Transportation (by truck or by air and rail, using third-party providers), parts procurement, supply chain management	United States and Asia
UPS	Genzyme, biotechnology	Warehousing and storage, tracking and tracing, distribution	United States, Puerto Rico, and the Netherlands
UPS	Samsung America, healthcare equipment	Transportation management, customs brokerage	United States and Asia

Source: Commission compilation from Armstrong & Associates Web site and company Web sites.

packages (table 3.7).[198] Some other large U.S.-based logistics firms include C.H. Robinson Worldwide, Expeditors International of Washington, Caterpillar Logistics Services, and Penske Logistics. All of these firms operate globally and typically have hundreds of offices worldwide. Like FedEx and UPS, these firms have added logistics and supply chain capabilities to their main lines of business which, for example, include the transportation of heavy freight (Caterpillar) and the arrangement of transportation services (C.H. Robinson and Expeditors). For all firms, supply chain management is a fast-growing business segment, with U.S. revenues for supply chain services having grown by about 20 percent during 2004–09.[199]

Examples of Logistics Firms' Participation in Supply Chains

Two examples drawn from the global operations of U.S. firm Penske illustrate how deeply logistics firms have become integrated into their customer's supply chains and highlight their growing importance in maintaining their clients' competitiveness. In Brazil, Penske manages distribution operations for the large Korean electronics manufacturer Samsung, which produces appliances, computer monitors, and televisions. Penske has set up a large warehouse outside of São Paulo, Brazil, near Samsung's manufacturing facility. Samsung products that are manufactured both in Brazil and in foreign markets are received and stored in Penske's São Paulo warehouse. Penske also

[198] In the United States, as in the global market, leading 3PLs are composed principally of transportation services firms that, over time, have added logistics and supply chain management capabilities to their core business.

[199] Armstrong & Associates, "Bigger and Better: 3PL Financial Results, 2004," 2004; Armstrong & Associates, "U.S. 3PL Market Size Estimates," 2009. Estimates are based on four services: non-asset-based domestic transportation management, international transportation management, warehousing and distribution, and software services.

TABLE 3.7 Top 10 U.S. 3PL firms by logistics revenues, 2009

Company	Core business of parent	Logistics revenues (Millions of $)
C.H. Robinson	Freight forwarding	7,577
UPS Supply Chain Solutions[a]	Express delivery	7,516
Expeditors International of Washington	Freight forwarding	4,092
Caterpillar Logistics	Heavy equipment manufacturing	3,119
Penske Logistics	Truck rental and leasing	2,387
Schneider Logistics	Truck transport	2,200
Ryder Supply Chain Solutions	Truck rental and leasing	1,611
FedEx Supply Chain Services[b]	Express delivery	1,501
Menlo Worldwide Logistics	Freight forwarding	1,326

Source: Armstrong & Associates, "A&A's Top 50 Global Third-Party Logistics Provider (3PL) List"; Armstrong & Associates' Top 40 North American 3PLs List" (accessed February 24, 2011); company Web sites.

[a]In 2009, total revenues for UPS were $45.3 billion.
[b]In fiscal year 2009, total revenues for FedEx were $34.7 billion.

prepares orders for outbound distribution to Samsung's commercial customers in Brazil, which include large retail outlets such as Carrefour and Wal-Mart. Other services provided by Penske to Samsung include processing returns, repairing products, checking product quality, and repackaging.[200]

In China, Penske has operated three warehousing facilities outside of Shanghai since acquiring a local logistics firm in 2006. The acquisition enabled Penske to receive three separate licenses from the Chinese government permitting Penske to function simultaneously as an international trading company, a freight forwarder, and a customs broker. Penske now performs a variety of logistics services for companies operating in China. For instance, the company manages import and domestic distribution for BMW; customs clearance and distribution for General Electric (GE); and export consolidation and international transportation for a furniture manufacturer, Knoll.[201]

Transportation Networks

The transportation networks of large logistics service providers, such as FedEx and UPS, are organized around primary air hubs that connect to smaller, regional hubs (or spokes). Each hub has a sorting, warehousing, and storage facility, as well as access to nearby road and rail transport.[202] 3PLs' hub-and-spoke network saves costs for manufacturing firms by centralizing the inbound and outbound distribution of raw materials and finished goods. Electronic data interchange systems, which allow 3PLs to "plug into" the operations of their clients, let both sides track inventory and shipments in real time.[203] The networks of large logistics firms are global in scope, with each firm's primary U.S. hub connecting to several hubs located abroad. The location of these hubs in Europe, North America, and Asia coincides with regions of major supply chain activity.

[200] Armstrong, "Penske Logistics Leverages Local Expertise," 2007.
[201] Armstrong, "Penske Logistics Leverages Multinational Relationships in Expanding Asian Operations," 2007.
[202] Konrad, "Louisville Flies High," 2010.
[203] Bhatnagar and Viswanathan, "Re-engineering Global Supply Chains," 2000, 13–34; FedEx, "FedEx Introduces Worldwide Technology Enhancements" (accessed February 22, 2011). Electronic data interchange refers to the "computer-to-computer" exchange of data that is delivered in standardized formats. More recently, FedEx has introduced Web-based software that enables its customers to track and manage inventory directly via the Internet.

Logistics service providers set up their hubs where commercial and industrial activity is likely to flourish; 3PL customers often locate their operations near such hubs, creating the so-called logistics "corridors" that are a combination of manufacturing, transportation, distribution, and customs processing facilities. These operations centralize activities essential to the smooth flow of goods within global supply chains. For example, UPS's air hub in Louisville, Kentucky, covers more than 600,000 square feet of warehousing and distribution space, with connections to road, rail, and water transportation. The hub also includes a foreign trade zone for customs processing that employs 750 people providing customs brokerage services.[204] More than 100 firms have chosen sites close to UPS' Louisville hub to take advantage of the latter's transportation and distribution network.[205] Such companies include online footwear vendor Zappos and biotechnology firm Genentech.[206]

Similarly, numerous U.S. firms have set up distribution operations near the FedEx air hub facility in Memphis, Tennessee, including HP, Nike, Pfizer, and GlaxoSmithKline.[207] The FedEx hub has also attracted more than 130 firms from 22 foreign countries to Memphis. Together, these firms employ roughly 17,000 workers in the Memphis area[208]—nearly half again as many as the approximately 12,000 FedEx employees in the company's Memphis hub.[209]

Policies That Affect Logistics Service Providers

Logistics and supply chain service providers are subject to a range of government policies that influence where they establish, how they operate, and what services they provide. These policies most commonly pertain to FDI, licensing, customs procedures, cargo security, and air traffic rights. Unfavorable policies on air transportation rights or FDI, in particular, prevent logistics firms from serving new markets or from expanding service in countries where they are already located.[210] Logistics service providers may also be hampered by poor transportation infrastructure in host countries, including limited capacity at airports and seaports, insufficient road and rail networks, and inadequate customs processing facilities.[211] Deficient infrastructure reduces both the speed and the reliability with which logistics firms deliver their services and may undermine the ability of these firms, as well as their customers, to compete.[212] One study estimates that removing such obstacles—both infrastructure and policy-related—would boost global GDP and employment, substantially increasing economic welfare overall.[213]

[204] Armstrong & Associates, "UPS Revamps Supply Chain Service Offering," April 8, 2008; Armstrong & Associates, "A&A's Top 40 North American 3PLs List" (accessed April 28, 2011).

[205] Oxford Economics, "The Impact of the Express Delivery Industry," 2009, 32.

[206] Konrad, "Louisville Flies High," 2010.

[207] Inbound Logistics, "Memphis: North America's Logistics Center," October 2010, 3.

[208] Oxford Economics, "The Impact of the Express Delivery Industry," 2009, 31.

[209] FedEx, "Video: Inside the Memphis Superhub" (accessed April 1, 2011).

[210] Oxford Economics, "The Impact of the Express Delivery Industry," 2009, 41–42.

[211] Air traffic rights refer to the permission granted to airlines of countries that are signatories to air transport agreements to carry passengers and cargo to, from, or within each other's air transport markets.

[212] Nordas et al., "Logistics and Time as a Trade Barrier," 2006, 16, 19.

[213] Oxford Economics, "The Impact of the Express Delivery Industry," 2009, 40. In China, for example, the removal of restrictions on express delivery (and logistics service) providers were estimated to result in an increase in output of $180 billion over a five-year period, as well as the creation of 700,000 jobs.

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APPENDIX A
Request Letters

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

MAY 15 1992

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

Dear Mr. Chairman,

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

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

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

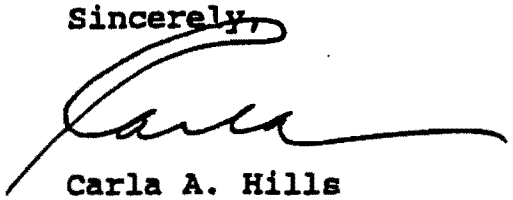
antidumping or countervailing duty investigations, section 337 or 406 investigations, or section 301 actions.

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

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

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

Sincerely,



Carla A. Hills

EXECUTIVE OFFICE OF THE PRESIDENT
THE UNITED STATES TRADE REPRESENTATIVE
WASHINGTON, D.C. 20508

The Honorable Deanna Tanner Okun
Chairman
U.S. International Trade Commission
500 E Street, SW
Washington, D.C. 20436

AUG 16 2010

Dear Madam Chairman:

The U.S. International Trade Commission's (Commission) series of reports on the economic effects of significant U.S. import restraints, prepared as part of Investigation. No. 332-325, has been an objective and balanced source of information for the President, the Congress, the trade policy community, and the public. As your reports have shown, the costs imposed on U.S. economic welfare by U.S. import restraints have declined markedly since 1992, even as the volume of U.S. imports has grown substantially.

The United States now stands as one of the world's most open economies. As the Commission begins work on the seventh update of the its report, and in light of the high degree of openness of U.S. markets to imports that has already been achieved, I am requesting that the Commission include in its report information on another important development in U.S. trade.

The disaggregation of production processes among countries has altered the patterns of production and trade in the world economy, including those of the United States. The effect of these global supply chains is known by many trade professionals, but I would like this information accessible to a wider audience. I am therefore requesting that the Commission provide an overview in this seventh update on these supply chains and the economic forces behind them. The report should also describe the current U.S. involvement in this global phenomenon and include a general discussion on the effects that these supply chains may have on U.S. companies, workers, and consumers. The report should incorporate key indicators of U.S. involvement and a review of the literature. A thoughtful overview that is accessible to readers who may not be professional economists could be a useful contribution.

Please provide the seventh update of this Report, with the additional section, 12 months after receipt of this request. As stated in the original 1992 request letter, subsequent updates of the report should be provided thereafter at intervals of approximately two years. USTR intends to make the Commission's report available to the general public in its entirety. Therefore, the report should not contain any confidential business or national security classified information.

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

Sincerely,

Ambassador Ron Kirk

APPENDIX B
Federal Register Notice

Alternative is similar to the Proposed Action in development sequence and facilities, but contains additional drainage control structures to manage storm water run-off. Total surface disturbance for this alternative is 2,748 acres.

The ROD approves only the Phase 1 portion of Alternative 2, the Proposed Action. Phase 2 and Phase 3 of the Proposed Action are not authorized in the ROD and may be considered in the future when the necessary electric transmission upgrades are proposed. At that time, the BLM will prepare any necessary additional environmental review.

Authority: 40 CFR 1506.6 and 1506.10.

Robert V. Abbey,

Director, Bureau of Land Management.

[FR Doc. 2010–26264 Filed 10–18–10; 8:45 am]

BILLING CODE 4310–HC–P

INTERNATIONAL TRADE COMMISSION

[Investigation No. 332–325]

The Economic Effects of Significant U.S. Import Restraints: Seventh Update; Special Topic: Global Supply Chains

AGENCY: United States International Trade Commission.

ACTION: Notice of seventh update report and scheduling of public hearing.

SUMMARY: Following receipt of a request dated August 16, 2010 from the United States Trade Representative (USTR), the U.S. International Trade Commission (Commission) has announced its schedule for preparing the seventh update report in investigation No. 332–325, *The Economic Effects of Significant U.S. Import Restraints,* including the scheduling of a public hearing in connection with the investigation for December 16, 2010.

DATES:

November 29, 2010: Deadline for filing requests to appear at the public hearing.

November 29, 2010: Deadline for filing pre-hearing briefs and statements.

December 16, 2010: Public hearing.

January 6, 2011: Deadline for filing post-hearing briefs and statements.

February 7, 2011: Deadline for filing all other written submissions.

August 12, 2011: Transmittal of Commission report to USTR.

ADDRESSES: All Commission offices, including the Commission's hearing rooms, are located in the United States International Trade Commission Building, 500 E Street SW., Washington, DC. All written submissions should be addressed to the Secretary, United States International Trade Commission, 500 E Street SW., Washington, DC 20436. The public record for this investigation may be viewed on the Commission's electronic docket (EDIS) at *http://www.usitc.gov/secretary/edis.htm.*

FOR FURTHER INFORMATION CONTACT: Project Leader William Powers (*william.powers@usitc.gov* or 202–708–5405) or Deputy Project Leader Jose Signoret (*jose.signoret@usitc.gov* or 202–205–3125) for information specific to this investigation (the seventh update). For information on the legal aspects of this investigation, contact William Gearhart of the Commission's Office of the General Counsel (202–205–3091 or *william.gearhart@usitc.gov*). The media should contact Margaret O'Laughlin, Office of External Relations (202–205–1819 or *margaret.olaughlin@usitc.gov*). Hearing-impaired individuals may obtain information on this matter by contacting the Commission's TDD terminal at 202–205–1810. General information concerning the Commission may also be obtained by accessing its Internet server (*http://www.usitc.gov*). Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at 202–205–2000.

Background: The Commission instituted this investigation under Section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1332(g)) following receipt of an initial request from the USTR dated May 15, 1992. The request asked that the Commission assess the quantitative economic effects of significant U.S. import restraints on the U.S. economy and prepare periodic update reports after the initial report. The Commission published a notice of institution of the investigation in the **Federal Register** of June 17, 1992 (57 FR 27063). The first report was delivered to the USTR in November 1993, the first update in December 1995, and successive updates were delivered in 1999, 2002, 2004, 2007, and 2009. In this seventh update, as requested by the USTR in a letter dated August 16, 2010, the Commission will, in addition to the quantitative effects analysis similar to that included in prior reports, include an overview of global supply chains, including the economic forces behind them and current U.S. involvement in them. The USTR asked that the overview be accessible to readers who may not be professional economists. As in previous reports in this series, the seventh update will continue to assess the economic effects of significant import restraints on U.S. consumers and firms, the income and employment of U.S. workers, and the net economic welfare of the United States. This assessment will use the Commission's computable general equilibrium model. However, as per earlier instructions from the USTR, the Commission will not assess import restraints resulting from antidumping or countervailing duty investigations, section 337 and 406 investigations, or section 301 actions.

Public Hearing: A public hearing in connection with this investigation will be held at the United States International Trade Commission Building, 500 E Street SW., Washington, DC, beginning at 9:30 a.m. on December 16, 2010. Requests to appear at the hearing should be filed with the Secretary no later than 5:15 p.m., November 29, 2010, in accordance with the requirements in the "Submissions" section below. All pre-hearing briefs and statements should be filed not later than 5:15 p.m., November 29, 2010; and all post-hearing briefs and statements should be filed not later than 5:15 p.m., January 6, 2011. In the event that, as of the close of business on November 29, 2010, no witnesses are scheduled to appear at the hearing, the hearing will be canceled. Any person interested in attending the hearing as an observer or nonparticipant may call the Secretary to the Commission (202–205–2000) after November 29, 2010, for information concerning whether the hearing will be held.

Written Submissions: In lieu of or in addition to participating at the hearing, interested parties are invited to file written submissions concerning this investigation. All written submissions (other than pre- and post-hearing briefs and statements) should be addressed to the Secretary, and should be received not later than 5:15 p.m., February 7, 2011. All written submissions must conform with the provisions of section 201.8 of the Commission's *Rules of Practice and Procedure* (19 CFR 201.8). Section 201.8 requires that a signed original (or a copy so designated) and fourteen (14) copies of each document be filed. In the event that confidential treatment of a document is requested, at least four (4) additional copies must be filed, in which the confidential information must be deleted (see the following paragraph for further information regarding confidential business information). The Commission's rules authorize filing submissions with the Secretary by facsimile or electronic means only to the extent permitted by section 201.8 of the

rules (*see* Handbook for Electronic Filing Procedures, *http://www.usitc.gov/secretary/fed_reg_notices/rules/documents/handbook_on_electronic_filing.pdf*). Persons with questions regarding electronic filing should contact the Secretary (202–205–2000).

Any submissions that contain confidential business information must also conform with the requirements of section 201.6 of the *Commission's Rules of Practice and Procedure* (19 CFR 201.6). Section 201.6 of the rules requires that the cover of the document and the individual pages be clearly marked as to whether they are the "confidential" or "non-confidential" version, and that the confidential business information be clearly identified by means of brackets. All written submissions, except for confidential business information, will be made available for inspection by interested parties.

In its request letter, the USTR stated that his office intends to make the Commission's report available to the public in its entirety, and asked that the Commission not include any confidential business information or national security classified information in the report it sends to the USTR. Any confidential business information received by the Commission in this investigation and used in preparing this report will not be published in a manner that would reveal the operations of the firm supplying the information.

By order of the Commission.

Issued: October 14, 2010.

William R. Bishop,

Acting Secretary to the Commission.

[FR Doc. 2010–26235 Filed 10–18–10; 8:45 am]

BILLING CODE P

DEPARTMENT OF JUSTICE

Notice of Lodging of Consent Decree Under the Comprehensive Environmental Response, Compensation, and Liability Act and The Clean Water Act

Notice is hereby given that on October 12, 2010, two proposed Consent Decrees in *United States and State of Louisiana* v. *ConocoPhillips Company and Sasol North America Inc.,* Civil Action No. 2:10-cv-1556, were lodged with the United States District Court for the Western District of Louisiana.

In this action the United States, on behalf of the United States Environmental Protection Agency, the United States Department of the Interior, and the National Oceanic and Atmospheric Administration of the United States Department of Commerce, and the State of Louisiana, on behalf of the Louisiana Department of Wildlife and Fisheries ("LDWF") and the Louisiana Department of Environmental Quality ("LDEQ"), sought, pursuant to Sections 106 and 107(a) of the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), 42 U.S.C. 9606 and 9607(a), and pursuant to Section 311(f) of the Clean Water Act, 33 U.S.C. 1321(f), (1) Reimbursement of response costs incurred and to be incurred by the governments in connection with the Calcasieu Estuary Superfund Site ("Site"), (2) injunctive relief requiring performance of response actions by Defendants; and (3) recovery of damages for the injury to, destruction of, or loss of natural resources under the trusteeship of the federal and state trustees, as a result of releases and threatened release of hazardous substances into the environment at or from the Site, including the recovery of the costs of assessing such injury and damages and the future costs of overseeing and monitoring restoration actions. The Calcasieu Estuary Superfund Site is located in Louisiana and includes the aerial extent of contamination within the area of the Estuary encompassing Bayou Verdine, Bayou d' Inde, Coon Island Loop, Clooney Island Loop, Prien Lake, Lake Charles, and the Calcasieu River from the saltwater barrier to Moss Lake.

The United States and the State have negotiated two separate consent decrees to resolve the CERCLA and CWA claims against Settling Defendants, as well as the state law claims. The proposed Consent Decrees resolve the liability of ConocoPhillips Company and Sasol North America Inc. for response costs incurred and response actions taken in connection with the Site and for damages for injury to, loss of, or destruction of natural resources at the Site as alleged in the Complaint. Under the Consent Decree for Removal Action and Recovery of Response Costs, Settling Defendants have agreed to: (1) Reimburse the United States $4,553,547 of past response costs for the Site and 100% of future oversight costs related to the selected removal action for Bayou Verdine, and (2) perform a non-time critical removal action within Bayou Verdine and adjacent areas at the Site in accordance with the Action Memorandum for a Removal Action at the Calcasieu Estuary Superfund Site, Bayou Verdine Area of Concern, Lake Charles, Calcasieu Parish, Louisiana, executed by EPA on August 6, 2003. This Consent Decree includes a covenant not to sue by the United States and the State under Sections 106 and 107 of CERCLA, under Section 311(f) of the Clean Water Act, and under Section 7003 of the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. 6973.

Under the Consent Decree for Natural Resource Damages, Settling Defendants have agreed to (1) reimburse the federal and state trustees nearly $1,200,000 of past natural resource damages assessment costs, (2) perform construction of a restoration project selected by the trustees in accordance with the Final Restoration Plan and Environmental Assessment for the Bayou Verdine Site, and (3) pay an additional sum of $750,000 toward further monitoring or corrective action after completion of construction of the restoration project. Under the terms of the Consent Decree and the assessment and restoration plan finalized by the Trustees, the Settling Defendants will construct the Sabine Unit 1999 Restoration Project to compensate for the natural resources losses attributable to Settling Defendants' releases of hazardous substances into the Calcasieu Estuary. The Project will create over 14 new acres of marsh, enhance the ecological functioning of approximately 247 acres of existing marsh, and increase the expected functional life span of these marshes. It is to be performed in the Calcasieu Estuary at a designated site within the Sabine National Wildlife Refuge. This Consent Decree includes a covenant not to sue by the United States and the State under Section 107 of CERCLA and under Section 311(f) of the Clean Water Act.

The two proposed Consent Decrees are to become effective only after both have been entered by the Court.

The Department of Justice will receive for a period of thirty (30) days from the date of this publication comments relating to the Consent Decree. Comments should be addressed to the Assistant Attorney General for the Environment and Natural Resources Division, U.S. Department of Justice, and either e-mailed to *pubcomment-ees.enrd@usdoj.gov* or mailed to P.O. Box 7611, NW., Washington, DC 20044–7611, and should refer to *United States and State of Louisiana* v. *ConocoPhillips Company and Sasol North America Inc.,* D.J. Ref. 90–11–2–1284 and 1284/1. Commenters may request an opportunity for a public meeting in the affected area, in accordance with Section 7003 (d) of RCRA, 42 U.S.C. 6973(d).

The Consent Decrees may be examined at the Office of the United States Attorney, Western District of Louisiana, 800 Lafayette Street, Suite

APPENDIX C
Calendar of Public Hearing

CALENDAR OF PUBLIC HEARING

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

Subject:	The Economic Effects of Significant U.S. Import Restraints: Seventh Update Special Topic: Global Supply Chains
Inv. No.:	332-325
Date and Time:	December 16, 2010 - 9:30 a.m.

A session was be held in connection with this investigation in the Main Hearing Room (room 101), 500 E Street, S.W., Washington, D.C.

ORGANIZATION AND WITNESS:

The University of California, Irvine
Irvine, CA

Professor Kenneth L. Kraemer, Research Professor, The Paul Merage School of Business and The Donald Bren School of Information and Computer Science; *and* Co-Director, The Personal Computing Industry Center; *and* Associate Director, Center for Research on IT and Organizations

Georgetown University
Washington, D.C.

Professor J. Bradford Jensen, Associate Professor of Economics and International Business, McDonough School of Business

The New School for Social Research
New York, NY

Professor William Milberg, Professor of Economics; *and* Department Chair

ORGANIZATION AND WITNESS:

Center for Investigation, Promotion, and Advice
Fairfax Station, VA

Dr. Maria del Pilar Lodoño-Kent, President and Founder

Express Association of America
Great Falls, VA

Michael C. Mullen, Executive Director

Intel Corporation
Phoenix, AZ

Greg S. Slater, Director, Global Trade and Competition Policy

Promar International
Alexandria, VA
on behalf of

The Sweetener Users Association

Thomas Earley, Vice President, Promar International; *and* Economist, The Sweetener Users Association

Squire, Sanders & Dempsey L.L.P.
Washington, D.C.
on behalf of

The U.S. Association of Importers of Textiles & Apparel (USA-ITA)

Julia Hughes, President, USA-ITA

David M. Spooner) – OF COUNSEL

- END -

APPENDIX D
Positions of Interested Parties

Introduction

The summaries of the positions of interested parties are based on information provided at a public hearing held on December 16, 2010, and material submitted to the Commission in conjunction with this investigation (table D.1). The summaries express the views of the submitting parties and not those of the Commission, whose staff did not attempt to confirm the accuracy of or make corrections to the information provided. The full text of the hearing transcript and written submissions associated with the current investigation can be found by searching the Commission's Electronic Docket Information System.[1]

TABLE D.1 Information provided by interested parties

	Hearing Testimony	Submission
American Apparel and Footwear Association		x
American Sugar Alliance		x
Bumble Bee Foods, LLC		x
Center for Investigation, Promotion, and Advice	x	x
Express Association of America	x	x
Fonterra (USA), Inc.		x
Intel Corporation	x	x
Professor J. Bradford Jensen, Georgetown University	x	
Professor Kenneth L. Kraemer, University of California, Irvine	x	x
Professor William Milberg, New School for Social Research	x	x
National Milk Producers Federation		x
Sweetener Users Association	x	x
U.S. Association of Importers of Textiles and Apparel	x	x

Source: USITC Electronic Docket Information System.

American Apparel and Footwear Association[2]

The American Apparel and Footwear Association (AAFA) said that it is a national association representing apparel and footwear industries and their suppliers. The association's submission noted that 97 percent of all apparel and 99 percent of all footwear sold in the United States is imported. It said that domestic production of apparel and footwear is intended for certain niche markets, including the U.S. military.

The submission asserted that the apparel and footwear industries are subject to the highest tariffs of any non-agricultural product. The AAFA went on to say that, in 2010, the average effective tariff rates on U.S. imports of apparel and footwear were 10–13 percent, compared with an average effective tariff rate of 1.4 percent for all U.S. imports. The association said that U.S. imports of textiles, apparel, and footwear accounted for nearly one-half of all U.S. duties collected in 2010.

In its submission, the AAFA characterized U.S. import tariffs on apparel and footwear as "the most regressive that exist in the entire tariff schedule."[3] It stated, for example, that the duty rates on most silk apparel range from 0.6 to 3.8 percent, compared with 15.9–19.7 percent for most cotton apparel. Similarly, it reported that leather shoes are subject to duties ranging from 8.5 to 10 percent, compared with 37.5–67.5 percent for sneakers.

[1] Available online at https://edis.usitc.gov/edis3-internal/app.
[2] AAFA, written submission to the USITC, February 7, 2011.
[3] Ibid., 1.

The AAFA submission asserted that the duties are not only passed on to consumers at retail, but that they are effectively doubled or tripled through the normal mark-up process for an item, as it passes from first cost, to wholesale, to retail. It described this situation as U.S. consumers paying a "hidden tax" on their clothing and footwear equivalent to $25–$35 billion dollars.

The submission presented data from a 2002 report by the Federal Reserve Bank of Dallas that estimated the cost to the U.S. economy of saving a single job in various highly-protected industries. The AAFA reported that the study indicated a cost of $1.3 million for every luggage manufacturing job saved, and $199,241 for every apparel and textiles job saved. The submission said that it is likely the "cost" per job is higher now, since U.S. manufacturing employment in these industries has declined since 2002.

The association described how U.S. footwear firms that import fabric and rubber upper footwear with rubber outsoles engineer their products to reduce their import duties from 20–67.5 percent (for footwear classified in HTS headings 6402 and 6204) to 7.5–12.5 percent (for HTS heading 6405). Specifically, it said that these firms imbed fabric into the rubber outsoles, or cover outsoles with fabric, strictly for the purpose of changing the classification of the footwear and thereby lowering the rate of duty.

The AAFA submission addressed the role of global supply chains in creating jobs in the apparel and footwear industries. It asserted that, although most of the jobs assembling clothing and footwear have moved offshore, virtually every other step in the process, from design to getting the product into the store, is done by workers in United States. The AAFA summarized by stating that the apparel and footwear industry employs over 1 million workers in a wide variety of areas—including research, design, sourcing, logistics, warehousing, marketing, sales, and retail sales—adding that the apparel and footwear sectors also support "hundreds of thousands" of U.S. manufacturing jobs.[4]

American Sugar Alliance[5]

In a written submission to the Commission, the American Sugar Alliance (ASA) said that it has consistently argued that the Commission's work on the effect of U.S. sugar import restraints is flawed because the Commission underestimates the number of jobs in the U.S. sugar industry, underestimates the potential harm to the sector if the restraints were lifted, and overestimates job creation if the restraints were lifted.[6]

The ASA asserted that the number of jobs in the U.S. sugar sector should include indirect employment and that job losses in the sector likely would be greater than calculated by the Commission. The ASA asserted that the food manufacturing sector has been profitable and expanding, and that sugar represents a small fraction of product costs and food manufacturer location decisions. The ASA said that any cost savings resulting from the lifting of U.S. sugar import restraints would not be passed to consumers. The ASA contended that the elimination of U.S. sugar import restraints would not result in increased exports and jobs of the magnitude projected by the Commission in past studies.[7]

[4] AAFA, written submission to the USITC, February 7, 2011, 5.
[5] ASA, written submission to the USITC, February 7, 2011.
[6] Ibid., 1.
[7] Ibid., 1–3.

The ASA asserted that U.S. imports from Mexico are unconstrained, while subject to rules of origin requirements, and that this has affected the industry's ability to balance U.S. sugar supply and demand. The ASA asserted that U.S. sugar users would face difficulties in sourcing imported sugar with quality and dependability, comparable to that of domestic sugar should import restraints be lifted. The ASA noted that world sugar prices are near or at 30-year highs, that the price gap between U.S. and world sugar prices has narrowed, and that current world sugar prices are well above U.S. support prices, thus limiting the benefits of lifting import restraints.[8]

Bumble Bee Foods, LLC[9]

In a written submission, Bumble Bee Foods, LLC, stated that Bumble Bee is a privately held U.S. seafood company with the majority of its production facilities located in the United States. The firm noted that while it serves over 20 countries worldwide, Bumble Bee operates two of the last three canned tuna production facilities in the United States. The firm indicated that in 2010, Bumble Bee was the second-largest U.S. brand of canned tuna, with a 29 percent market share.

Bumble Bee said that the vast majority of canned tuna imports are packed in water. It described these imports as subject to a TRQ equal to 4.8 percent of the amount consumed in the United States during the previous year, and to in- and over-quota tariffs of 6 percent and 12.5 percent, respectively. The submission went on to say that canned tuna imports packed in oil are subject to a tariff of 35 percent. However, the firm said that this tariff provides few benefits to domestic producers because only 10 percent of U.S. canned tuna consumption is packed in oil. Tuna imports from several countries, including Canada, Mexico, Singapore, and Chile, receive duty-free treatment in the U.S. market because of free trade agreements. The firm also suggested that the current system of duties on imported canned tuna is overly complicated and complex to administer.

The Bumble Bee submission referred to several previous Commission investigations that found the U.S. canned tuna industry sensitive to imports. It further described U.S. consumer prices for canned tuna as among the lowest of all developed economies as a result of the intense competition from low-cost foreign suppliers. The firm said that the factors that made canned tuna imports sensitive in the past still apply today, and that "the industry is just a fraction of what it was 30 years ago because of increased competition from low cost imports and declining prices (in real terms) of our products."[10] Bumble Bee indicated that, between 1979 and 1989, five canneries, representing 40 percent of the industry workforce, shut down, and that another six canneries had closed since 1990.

Bumble Bee asserted that the rise of low-cost imports, particularly from Asia, is largely the result of significant wage disparities when compared with major tuna exporters. For example, it said that the average hourly wage rate in U.S. processing facilities ranged from about $5.50 in American Samoa to $14.22 in California, compared with only 88 cents in Thailand and even less in Ecuador. Further, Bumble Bee asserted that U.S. companies are put at an additional disadvantage because they must comply with health, welfare, safety, regulatory and environmental standards not required of foreign competitors. In the face of foreign competition, Bumble Bee said that it has taken several steps to remain economically viable, including increasing yields by using new technology and automation, shifting to processing tuna loins to reduce labor costs, and investing in

[8] ASA, written submission to the USITC, February 7, 2011, 4–5.
[9] Bumble Bee Foods, LLC, written submission to the USITC, January 12, 2011.
[10] Ibid., 5.

foreign sources of materials. However, the firm indicated that these measures are insufficient to offset the cost advantages of Bumble Bee's competitors.

The submission asserted that the current duty structure for imported canned tuna is the most important factor in the competitiveness of the U.S. tuna industry. It said that existing tariffs help maintain the 10,000 direct and indirect jobs the U.S. tuna industry supports, and protects direct investments in plants and facilities of more than $300 million. The firm asserted that all the investments and jobs associated with this industry would be destroyed if duty-free status were granted to any of the major Asian or Latin American tuna producers.

Center for Investigation, Promotion, and Advice[11]

Dr. María del Pilar Londoño-Kent, President and Founder of the Center for Investigation, Promotion, and Advice, provided both a written statement and hearing testimony. In her written statement, and again in her testimony, Dr. Londoño-Kent summarized research that her center has done that compared major border crossings between Mexico and the United States, and between Canada and the United States—particularly a time-motion study that captured data on the amount of time and other activities required for trucks to cross these borders. She said that the team of researchers simulated the potential gains from trade facilitation by substituting the process used at the U.S.-Canada border for the one used at the U.S.-Mexico border. She said that it estimated welfare gains for the United States of $1.4 billion per year, and $1.8 billion per year for Mexico. She said it also estimated that U.S. exports to Mexico would increase by about $6.0 billion per year, while Mexico's exports to the United States would increase by about $1.0 billion per year.

In her hearing testimony, Dr. Londoño-Kent said that conditions at the U.S.-Mexico border involve a process required by Mexican law that interjects multiple steps not required at the U.S.-Canada border, leading to massive duplication of data, goods handling, and truck movement. She characterized these extra steps as increasing the time required to cross the border, increasing uncertainty and making just-in-time inventory standards difficult to implement. She reported that crossing the U.S.-Mexico border can take several days, when it might take only 15 minutes in a more efficient setting. She said that extra steps increased the cost of border crossing by $300 to $600 per truck, and that these payments, multiplied in turn by 9 million trucks crossing the border annually, creates a powerful cartel of services providers that could be likened somewhat to U.S. mafias. Dr. Londoño-Kent said that border crossing costs are 75 percent higher southbound than northbound. She explained that northbound cargos employ bonds rather than brokers, making the process much faster.

She noted that 70 percent of trade between Mexico and the U.S. moves by truck. She also cited a Federal Reserve Bank of Dallas study that states that increased security measures since the September 11, 2001, terrorist attacks have "thickened" the border and increased costs and delays associated with the border crossing of goods, services, and travelers. Moreover, this increased congestion has, in turn, further exacerbated security concerns.

[11] USITC, hearing transcript, December 16, 2010; and Londoño-Kent, written submission to the USITC, November 24, 2010.

Express Association of America[12]

In his testimony before the Commission, Michael C. Mullen, Executive Director of the Express Association of America (EAA), said that EAA represents the express delivery, logistics, and freight forwarding industries, including the four largest global express delivery providers—DHL, FedEx, TNT, and UPS. In his written testimony, Mr. Mullen cited these four EAA member companies as having estimated total revenues in excess of $86 billion, employing more than 1.1 million people, using more than 980 aircraft, and delivering over 20 million packages each day.

In his written testimony, Mr. Mullen said that the EAA aims to promote the business and legislative interests of these and other member firms, with a particular focus on the areas of supply chain security and trade facilitation. He also said that express delivery and logistics firms play a critical role in global production and supply chains. He said that this role involves providing both large and small customers access to "reliable and efficient delivery networks" that transport goods and services with "speed, dependability, and [at] low cost."[13]

Mr. Mullen further said that the ability of express delivery and logistics firms to fulfill their role in global supply chains is contingent upon having in place appropriate hard infrastructure (e.g., airports and roads) and soft infrastructure (e.g., customs procedures). He expressed the view in particular that improvements to soft infrastructure are key to facilitating trade and realizing the full benefits of global supply chains.

In his testimony, Mr. Mullen recommended that the United States, together with its trade partners, adopt certain policy measures related to soft infrastructure. These measures, he said, might involve developing a single customs "window" through which customs-related information can be submitted to multiple government agencies at the same time; harmonizing border clearance requirements; raising the de minimis level on low-value shipments (e.g., from $200 to $800 for the United States); and implementing cargo security and trade facilitation agreements under the World Customs Organization (WCO), such as the SAFE Framework of Standards to Secure and Facilitate Trade, and the Revised Kyoto Convention on the Simplification and Harmonization of Customs Procedures.

Fonterra (USA), Inc.[14]

In its written submission, Fonterra (USA), Inc., indicated that it is a wholly owned U.S. subsidiary of Fonterra Co-operative Group Limited ("Fonterra"), based in Auckland, New Zealand. Fonterra described itself as a multinational company that manufactures and exports dairy ingredients and consumer products to over 140 countries. It said that Fonterra (USA) generates annual U.S. sales of over $2 billion and, with its partners in the U.S. market, employs between 600 and 700 people. Fonterra said that through its investments in the United States it is able to source milk for dairy exports to Mexico, Asia, and the Middle East. Its submission further said that exports from Fonterra assets in

[12] USITC, hearing transcript, December 16, 2010; Mullen, written testimony submitted to the USITC, December 16, 2011.

[13] Mullen, written testimony submitted to the USITC, December 16, 2010, 2.

[14] Fonterra (USA), Inc., written submission to the USITC, February 7, 2011.

New Zealand and Australia alone will not be able to keep up with the growth in global demand for dairy products.

Fonterra characterized U.S. dairy product TRQs, with the exception of food preparations and possibly american-type cheese, as "significantly underfilled through the third quarter of 2010."[15] It suggested that this reflects a systemic problem with the administration of the U.S. dairy TRQs that has resulted in persistent underfilling of quotas, given the substantial U.S. demand for imported dairy products. Fonterra added that the underfilling also reflects fundamental change that has taken place in the structure of the international dairy trade. Fonterra asserts that Australia and the European Union, longstanding dairy exporters, are producing lower volumes of dairy products, and that these suppliers' global market shares are declining. Fonterra proposes that the result is not only that traditional exporters are not filling their U.S. TRQs, but that they are also not available to meet increased demand in the rest of the world. This change, the submission suggests, has led to the rise of the United States as, increasingly, a dairy exporter more than an importer.

Fonterra's submission cites conclusions drawn from a study by the Innovation Center for U.S. Dairy, which concluded that the global demand for dairy products—particularly from China and other countries in Asia—will grow faster than the capacity to produce dairy in Europe, Australia, and New Zealand. Fonterra contends that the U.S. dairy industry is well positioned to take advantage of this rising global demand, particularly given the efficiency and inherent scalability of the U.S. grain-based production system, as well as the quality of U.S. dairy products.

Fonterra asserts in its submission, however, that a focus on competitiveness for the U.S. dairy industry will require some adjustments in U.S. dairy programs to allow market signals to work, including the repeal of the TRQ system for dairy products. Fonterra suggests that, while the U.S. dairy TRQs are not currently significantly binding, their existence and associated administrative burdens distort market signals and inhibit trade because the allocation of quotas are not attractive to importers and limit the product mix available for them to ship. One example provided by Fonterra is that the only TRQ to be filled is food preparations, a category that includes nontraditional dairy products that are already in short supply for U.S. consumers.

Intel Corporation[16]

In its submission, Intel Corporation (Intel) states that it is the world's largest manufacturer of high-volume computer, networking, and communications products, with revenue of over $37 billion in 2009 from sales to customers in over 120 countries. It says that, while three-quarters of its manufacturing capacity is in the United States, over three-quarters of its revenue is generated from overseas sales. It also explained that its business is part of a complex and decentralized global information and communications technology (ICT) supply chain characterized by high-volume trade. Intel's submission summarized the central theme of its comments as follows: "Border-related policy measures, however well-intentioned, can become ineffective and counterproductive for all stakeholders to the extent they disregard the complexity and decentralization of global supply chains." It also indicates that it is not presently experiencing any U.S. import restraints. Intel outlined a fundamental change in supply chain dynamics starting in the 1980s, in which ICT companies shifted from a vertically integrated supply chain model to a horizontally integrated one due to increased competitiveness. Intel also provided

[15] Fonterra (USA), written submission to the USITC, February 7, 2011, 2.
[16] Intel Corp., written submission to the USITC, December 16, 2010.

examples of where it believed that a failure to understand these supply chain dynamics in public policy decision-making created restraints on imports: one concerning non-preferential rules of origin, and another regarding special import admissibility and import declaration measures. Intel's submission concluded with several recommendations for the Commission concerning possible next steps in the area of import restraints found in supply chains. These include addressing the general trade implications of import restraints found in supply chains in the next USITC Import Restraints study; preparing a separate and more in-depth report on the complexities of regulating imports in a global supply chain environment; conducting a USITC-sponsored forum for congressional, administration, and industry stakeholders to discuss the issue; and ensuring stakeholders' awareness of the results of the U.S. government findings in this area.

Professor J. Bradford Jensen, Georgetown University[17]

In his testimony before the Commission, Professor J. Bradford Jensen summarized the results of his research examining official U.S. data for evidence of the way trade affects domestic firms. He pointed out that his results relate to U.S. exports, imports, and export participation in general, and not specifically to global supply chains. Professor Bradford explained that for trade in goods, exporters tend to be larger, more capital- and skill-intensive, more productive, and pay higher wages than nonexporting firms. He suggested that it is not exporting that makes firms better, but that exporting firms must be better in order to be able to succeed. He further suggests that this result is well known, and that economic modeling shows that the additional costs of exporting leads to a self-selection of the best firms into exporting.

Professor Jensen said that he found that much the same is true of importing firms: they also tend to be larger, more capital intensive, more productive, and pay higher wages than nonimporters. He said that these results for importers are less well known than those for exporters, and that future research and economic modeling may show similar costs to importing that promotes self-selection of the best firms into importing.

Additionally, Professor Jensen said that he found importing and exporting to be closely related, with 50 percent of importers also acting as exporters, and that firms that both import and export account for 90 percent of all U.S. trade. He further said that such firms can conduct at least some of their trade with foreign affiliates, making them globally engaged firms from which the United States sources almost 80 percent of its trade. These globally engaged firms, he indicates, are qualitatively different from other firms—larger than even most large firms, more likely to be present in low-income countries, and more trade intensive per worker than other firms.

Focusing on trade in services, Professor Jensen indicated that less is known about firms that trade services, but stated that services are also important. He pointed to the statistics that 50 percent of U.S. employment is in the service sector, but only 10 percent is in manufacturing. He said that the service sector offers higher pay than the manufacturing sector, moreover, with an average annual wage of $66,000 versus $50,000, respectively. He said that better service sector data is needed to understand the role of the U.S. service sector in the global economy.

Professor Jensen reported that service exporters—in particular, those in engineering, design, and architecture—are similar to goods exporters. He cited the similarities with

[17] USITC, hearing transcript, December 16, 2010.

goods exporters that they are bigger, more productive, and pay higher wages than nonexporters in their sector. He said that service importers are also larger and pay higher wages than non-exporters. He indicated that his research, however, showed that one in four manufacturing firms export, whereas only one in 20 service firms export.

He also said that large, rapidly developing countries have more impediments to services trade than developed countries do. Professor Jensen said that reducing the "myriad of impediments" to services trade should be a focus of trade policy.

Professor Kenneth Kraemer, University of California, Irvine[18]

In testimony before the Commission, Professor Kenneth L. Kraemer described research in which he took part that examined the effects of U.S. company participation in global value chains by following the production of Apple's iPod in 2006. In this research, he showed that the country in which the research and innovative functions occurred captured the largest portion of value within the global supply chain. For the iPod, he said, this research suggested that the U.S. lead firm, Apple, captured the largest portion of value, whereas China, the place of assembly, captured only about $5 of this value even though China—as the final exporter—is shown capturing value of up to $144 in most trade statistics. He emphasized that this difference can distort trade deficit figures. He also said that, although the study showed that the iPod generated 13,000 jobs in the United States and 27,000 jobs abroad, total U.S. wages in this process were twice that of non-U.S. wages making the benefit in wages almost equivalent.

Professor Kraemer drew a distinction between research and development. He said that incremental innovation can be done overseas, and that firms may be willing to outsource development that is not sensitive to intellectual property violations. He said that innovation is a key driver of economic growth, adding: "The success of domestically owned firms like Apple is key to financial value capture and creation of high wage jobs in the U.S. If Apple was a Chinese firm or a Japanese firm, those profits and jobs would be in those countries."

Referring to policy implications, Professor Kraemer said that innovative companies export, and that continued growth on the knowledge worker side, among engineers and marketers, for example, can in part be attributed to exports of those final products. For computer and peripheral equipment, he said, 72 percent of research and development spending is in the United States, but 58 percent of sales are outside the United States. He said that the United States should encourage innovation and entrepreneurship through education and through updating the skills of the existing workforce.

Professor William Milberg, New School of Social Research[19]

In his testimony and written submission, Professor Milberg addressed the consequences of increased organization of international trade and production through global supply chains, which he called global value chains (GVCs). He explained that a GVC is a system where lead firms govern international networks of producers and deliver goods or services to end users, and that they vary in degree, from fully integrated firms, to near

[18] USITC, hearing transcript, December 16, 2010; Kraemer, written submission to the USITC, November 29, 2010; and Kraemer, written testimony submitted to the USITC, December 16, 2010.

[19] USITC, hearing transcript, December 16, 2010; Milberg, written testimony submitted to the USITC, December 16, 2010; and Milberg, written submission to the USITC, December 20, 2010.

atomistic market relationships among suppliers. According to Professor Milberg, growth in GVCs is evidenced by growth in offshoring.

Professor Milberg's written submission identified three measurement problems in analyzing GVCs: (1) there are inadequate data on imported goods by sector, which, for the sake of analysis, leads to the assumption that all sectors use imported goods at the same average proportion; (2) import price indices are not accurate at the level of specific goods, which can underestimate price changes of imported inputs, understate imports, and overstate GDP; and (3) the increasing use of imported inputs in exports, which can make trade balance measures between countries less informative.

According to Professor Milberg, as offshoring increases, domestic labor demand decreases, but the domestic production cost of inputs also falls. He said that some of this lower cost is transmitted to lower prices for final goods, which increases market demand, while the rest is transmitted to profits. Some of the profits are reinvested, while some may be financialized. When welfare gains are reinvested, output increases (which increases labor demand) and productivity increases (which decreases labor demand).

Professor Milberg said he believes that increased offshoring is related to increased financialization, or "leakage," such as share buybacks, dividend payments, and merger and acquisition activity. GVC firms have been involved in massive buybacks in the 2000s. Professor Milberg claims that the United States must "capture greater dynamic gains" by "encouraging reinvestment of profits into physical and human capital and by reducing the attraction of share buybacks." He recommends the regulation of share buybacks and executive compensation packages, more generous depreciation allowances for nonfinancial corporate investment, and the elimination of tax deferrals on profits held abroad. Repatriated profits from abroad, due to the fungibility of funds, constitute 62 percent of the buybacks, according to his analysis. Also, if task employees can be hurt while firm profits and share prices grow, Milberg says, "we must be consistent by advocating policies so that winners compensate losers through more generous Trade Adjustment Assistance, for example."

Professor Milberg pointed out that growth of GVCs increases the import content of exports, so that any doubling of exports will have less of an impact on employment. Accordingly, he asserted, since China is heavily involved in GVCs, and China's value added is much less than the total market value of their exports, targeting China burdens non-Chinese firms and countries with GVCs running through China as a consequence. Finally, he stated that better data, especially on the structure of imported inputs and prices, would aid economists' ability to analyze the social consequences of GVCs.

National Milk Producers Federation[20]

The National Milk Producers Federation (NMPF) said that it represents U.S. dairy producers and producer-owned cooperatives. NMPF said that its 31 member cooperatives produce the majority of U.S. milk.

NMPF said that U.S. dairy farmers and their marketing cooperatives have a major economic interest in the international trade of dairy products, but that global markets are affected by a variety of trade-distorting subsidies in many countries. NMPF said that import-restraining measures also vary considerably between countries. It noted, for example, that import tariffs for skim milk powder and butter in Canada are much higher

[20] NMPF, written submission to the USITC, February 4, 2011.

than tariffs for the same goods in the United States. NMPF also said that the U.S. dairy industry must defend itself against export subsidies that the European Union retains the right to use, as needed.

NMPF said that existing U.S. dairy import restraints are important, considering the widespread harm that would be imposed on the U.S. dairy industry in their absence. NMPF said that it is particularly concerned about the impact that policy changes might have on U.S. dairy farmers, the dairy supply chain, and supporting businesses throughout rural America that rely on dairy production. Therefore, NMPF's concerns do not necessarily match the USITC's charge in the current investigation, but the results of the USITC's investigation do not make the concerns of dairy farmers and related rural businesses any less meaningful.

NMPF said that its analysis of global dairy markets shows that growth in dairy demand among emerging economies has pushed the globally traded dairy market from conditions tending toward oversupply to conditions tending toward undersupply. It said that production among traditional low-cost dairy suppliers has been insufficient to fill the growing global demand, with the result that world prices have generally increased to ration available supply and draw additional exports from higher-cost producers such as the United States.

NMPF expressed the view that it would be difficult to alter the USAGE-ITC model to specifically address dairy industry issues, and said that the model is limited in its ability to reflect (1) rapid and dynamic change in the globally traded dairy industry in the past 3–5 years, and (2) increasing integration of the U.S. dairy industry into the global market. Because globally traded dairy markets were relatively stable prior to 2006, previous import restraints studies have provided little insight into the potential for rapidly changing market characteristics to introduce an increased margin of error into the model results. Moreover, the submission asserts, the potential for increased error is compounded when the base period estimate, which does not reflect altered market conditions, forecasts into the future.

NMPF also said that the potential for error in the model's estimation of overall welfare gains from eliminating dairy TRQs is increased because of conflicts between recent market conditions and the inherent characteristics of the model. NMPF asserts that additional analysis would demonstrate that the inherent error in the modeling process is likely to be biased toward an overstatement of the welfare gains associated with the removal of U.S. dairy import quotas.

NMPF said that the U.S. domestic dairy market is not highly protected from global market impacts, even though restraints are imposed on certain dairy products. In support, it said that 135 of 392 dairy tariff lines in the HTS are not subject to TRQs, but instead are duty free or subject to low tariffs. Of the remaining items, it said that 126 are subject to lower in-quota duties and 131 represent higher, over-quota duty rates. NMPF asserts that the United States provides considerable, although not completely unhindered, access for dairy imports and cited in particular the access provided to milk protein concentrate (MPC), casein, and caseinates. According to NMPF, large volumes of U.S. imports of MPC, casein, and caseinates have interfered at times with the operation of U.S. dairy support programs.

Sweetener Users Association[21]

In written submissions to the Commission, the Sweetener Users Association (SUA) stated that the SUA represents confectioners, beverage companies, food manufacturers, bakers, dairy product manufacturers, cereal makers, and other companies that use sugar. The submission made the following points: (1) the provisions of the 2008 farm bill increased the adverse effects of sugar import restraints on U.S. sugar consumers and consumers; (2) the integration of the U.S. and Mexican sugar markets has been beneficial, but the overall market is still protected; (3) the addition of a separate tariff line in the HTS for high-quality refined sugar has been a positive development; and (4) U.S. sugar producers have attempted to manage sugar trade with Mexico in order to mitigate the full liberalization of the market under the North American Free Trade Agreement.

SUA summarized the main changes to the sugar program in the 2008 farm bill and said the most damaging provision was the lack of flexibility to increase the minimum quota for raw cane sugar until the second half of the October–September marketing year.[22] SUA stated that there was a shortage of U.S. sugar supplies in the 2009–10 marketing year, which caused sugar users to employ extraordinary measures, such as importing sugar at the over-quota tariff rate.[23] SUA said that the implementation of a new HTS statistical category for high-quality refined sugar was helpful in administering the sugar program.[24] SUA indicated that the implied cost of sugar import restraints to U.S. consumers totaled more than $5 billion in 2010. According to SUA, one result of U.S. sugar import restraints has been an increase in U.S. imports of sugar-containing products made with lower-cost, world-price sugar.[25] SUA stated that the U.S. sugar TRQ contributed to a contraction in the U.S. cane sugar refining industry, which relies on imported sugarcane.[26] SUA asserted that the current country-specific TRQ for raw cane sugar is outdated and inefficient.[27]

U.S. Association of Importers of Textiles and Apparel[28]

Julia Hughes, president of the U.S. Association of Importers of Textiles and Apparel (USA-ITA), said in testimony before the Commission that USA-ITA represents more than 200 apparel manufacturers and brands, retailers, distributors, importers, and related service providers. In both her testimony and a post-hearing statement, Ms. Hughes stated that apparel retailers and importers have faced the United States' most onerous restrictions on imports of manufactured goods for decades, especially from quotas that raised prices and limited consumer choices.[29] In its written statement, USA-ITA expressed the view that since the elimination of such quantitative restrictions, the most recent of which was the expiration of the U.S.-China apparel safeguard quotas agreement at the end of 2008, the U.S. textile industry has not lost competitiveness and China has not become the sole supplier of textiles and apparel to the U.S. consumers.[30]

[21] SUA, written submission to the USITC, November 29, 2010; SUA, written submission to the USITC, January 11, 2011.
[22] SUA, written submission to the USITC, November 29, 2010, 2.
[23] Ibid., 3.
[24] Ibid., 4.
[25] Ibid., 7.
[26] Ibid., 8.
[27] Ibid., 9.
[28] USITC, hearing transcript, December 16, 2010; Hughes, written testimony submitted to the USITC, December 16, 2010; and USA-ITA, written submission to the USITC, January 6, 2011.
[29] USITC, hearing transcript, December 16, 2010, 59.
[30] USA-ITA, written submission to the USITC, January 6, 2011, 3.

In her testimony, Ms. Hughes indicated that, despite the elimination of quotas, USA-ITA members continue to face some of the highest tariffs of any industry—with many tariffs in the double digits, and some exceeding 30 percent. She said that such tariffs are "regressive" because higher tariffs are imposed on goods such as infant apparel that burden low-income consumers, whereas "the wealthy pay a 1.2 percent tariff for silk scarves."[31]

Ms. Hughes asserted that high U.S. tariffs on U.S. textile and apparel goods also motivate foreign governments to impose their own high tariffs on U.S. goods, as well as nontariff barriers. As examples of nontariff barriers she listed standards, labeling, security measures, and untargeted customs enforcement measures that hinder access to export markets for U.S. companies such as Levi Strauss & Co. and Polo Ralph Lauren. Removing barriers to trade to support the smooth and safe operation of global supply chains is vital for these companies, she said.[32]

In her testimony, Ms. Hughes also addressed concerns about rules of origin and U.S. customs enforcement provisions for apparel, as well as free trade areas and preference programs that she stated are "complicated and differ more amongst the agreements than the rules for any other product."[33] She said that they disrupt the supply chain of apparel brands and retailers and serve as a barrier to expanded trade. Consequently, she said USA-ITA member countries strongly support efforts to harmonize rules of origin and customs regulations among trading partners in U.S. trade preference programs with Africa, the Caribbean, and Andean countries.[34] Ms. Hughes stated that the costs and complications associated with complying with existing rules of origin have limited participation in the free trade agreements and other trade preference programs.[35] In addition, Ms. Hughes stated that the agreements should be revised to reflect changes in commercial realities; in some cases, for example, the rules of origin were written to help certain companies that are no longer in business.[36]

In its written submission, USA-ITA offered several reasons to explain why China has not become the sole dominant supplier of textiles and apparel since the expiration of quotas and why a diverse supply chain is important: (1) retailers and apparel brands are willing to reward reliable, high-quality factories regardless of location and are reluctant to end business with reliable manufacturing partners for small, short-term savings; (2) China is not the low-cost producer for textiles or apparel it once was because its labor costs have been rising; (3) speed to market is an important sourcing factor prompting retailers and brands to place orders in the Western Hemisphere, with several Western Hemisphere apparel producers benefiting from the rebound in U.S. consumer demand; (4) retailers and apparel brands receive financial incentives to source textiles and apparel from countries with which the United States has free trade agreement and preference programs; (5) retailers and apparel brands recognize that they must mitigate risk by not placing all orders within one country, and that smart business planning requires more than one location for sourcing, as well as a flexible, global supply chain.[37]

[31] USITC, hearing transcript, December 16, 2010, 60–1.
[32] Ibid., 61–2.
[33] Ibid., 63.
[34] Ibid., 63.
[35] Ibid., 117–118; USA-ITA, written submission to the USITC, January 6, 2011, 5.
[36] USITC, hearing transcript, December 16, 2010, 126–127.
[37] USA-ITA, written submission to the USITC, January 6, 2011, 4–5.

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APPENDIX E
Model Projections and Additional Results

Overview of the Modeling Framework

The analytical framework used to analyze the economic impact of significant U.S. import restraints in this seventh update is quite similar to the frameworks used in the fifth and sixth updates. The current framework employs the U.S. Applied General Equilibrium (USAGE) model, a dynamic computable general equilibrium (CGE) model that describes, among other items, consumption, production and trade in over 500 U.S. sectors.[1] The model estimates the effects of removing (liberalizing) significant U.S. import restraints relative to a projection of the U.S. economy over the medium term. The model incorporates a baseline projection of the U.S. economy over the period 2005–15, based on both actual and forecast economic data, including estimates of the size of the import restraints. The projection assumes that current U.S. import restraints remain in place. Liberalizations reported in this update are alternative policy scenarios in which the significant import restraints are completely eliminated, either individually or all at once. The economic impact of liberalization is assessed by comparing the baseline and the alternative policy outcomes.

The USAGE model framework has three components: (1) input-output (I-O) accounts for over 500 industries and more than 500 commodities, (2) behavioral parameters, and (3) a system of equations that constitute the model specification or theory. The I-O accounts specify the transactions among U.S. individuals, firms, and the U.S. government for 2005 (the base year in this study), derived from I-O accounts for U.S. industries and types of final demand (e.g., imports, private and government consumption and investment expenditures, and inventory changes) published by the Bureau of Economic Analysis (BEA), U.S. Department of Commerce.[2]

While the I-O accounts provide information on the initial equilibrium of the U.S. economy, a set of elasticities help the framework determine how the economy would respond to a policy change. Elasticities reflect the degree to which firms or consumers alter their behavior in response to certain economic developments, such as a drop in the price of imports. For example, an income elasticity of demand for a good is the percentage change in consumer demand for that good that occurs in response to a 1 percent change in household income. The types of elasticities used by USAGE include elasticities of substitution between imported and domestic goods, elasticities of import supply, elasticities of export demand, elasticities of substitution between inputs in production, and income elasticities.

Where possible, the Commission has estimated some of these parameters using time series data that show how consumers and firms have responded to given changes in the past; otherwise, it has relied on published studies for estimates. With the exception of textiles and apparel and meatpacking, the elasticities of substitution between imported and domestic goods (known as Armington elasticities) are documented in Donnelly et al.[3] The Armington elasticities for the meatpacking plants sector and for the textiles and apparel sectors are based on Hertel et al.[4]

[1] For more detail on the USAGE framework, see USITC, *Import Restraints: Sixth Update*, 2009, app. E. For a complete specification of the USAGE model, see Dixon and Rimmer, "USAGE-ITC," June 2002.

[2] The 535 industries and 539 commodities in USAGE-ITC are derived from the 498 industries and 40 types of final demand found in the BEA I-O accounts (see Dixon and Rimmer, "MONASH-USA," May 2001; Winston, "Enhancing Agriculture and Energy Sector Analysis in CGE Modelling," January 2009.

[3] Donnelly et al., "Revised Armington Elasticities of Substitution for the USITC Model," January 2004.

[4] Hertel et al., "How Confident Can We Be in CGE-Based Assessments of Free Trade Agreements?" May 2003.

The final component of the USAGE framework is the system of equations that model the U.S. economy. These equations characterize three general conditions that together determine a general equilibrium solution.[5] First, activities are characterized by constant returns, so firms must earn zero real economic profits at the margin, and all the production technologies and preferences are derived from theoretical formulations constrained by these zero-profit conditions.[6] Second, the quantity supplied must equal the quantity demanded for each good and service in the economy. Third, all income must be accounted for by final demand or savings.

Model Projections

The USAGE baseline is a "business as usual" projection of the U.S. economy to 2015. Developing this baseline involves shocking key observable variables in the model with projections about how the economy will behave, derived from research conducted by USITC staff and other sources, mainly other federal government agencies. The detailed theoretical and empirical structure of the model then allocates these projected shocks across a wide range of variables at the sectoral level.

Key shocks include macroeconomic expenditure and income aggregates (consumption, investment, government spending, imports, and exports). This study sourced macroeconomic forecasts from the BEA, the U.S. Bureau of Labor Statistics (BLS), and the Congressional Budget Office. The latest available forecasts were used, from 2010 or 2011. As projections for specific components were not consistent across agencies, the resulting Commission macroeconomic baseline is an amalgam of these projections, modified according to further research and a consensus opinion among Commission economists.

The USAGE baseline adjusts these projections by taking in additional information from the International Monetary Fund and World Bank on the growth of world GDP; from the BLS on population, demographics, labor supply, and employment; from government and the academic literature on terms of trade (the relative prices of imports and exports) and exchange rate adjustments; and from diverse sources (including government and academic) on productivity comparisons between the United States and the rest of the world. Table E.1 gives the projected growth in key U.S. and global macroeconomic variables in the forecast period.

Projections for specific sectors are also informed by supplemental data from a wide range of sources. As discussed in chapter 1, the projections of sectors with significant restraints are refined using data on recent growth in prices, output, imports, and exports; sector-specific forecasts from organizations such as the Food and Agricultural Policy Research Institute (FAPRI); trade journals and industry research reports (such as those from IBISWorld); and policy mandates such as the U.S. Renewable Fuel Standard (RFS).[7] Table E.2 presents projected values and sources for selected sectors with significant restraints.

[5] Technically, this represents an Arrow-Debreu competitive general equilibrium. Debreu, *The Theory of Value*, 1959.

[6] When returns to scale are constant, the average cost of production does not decline as the volume of production rises.

[7] In addition to the sources given in chap. 2, dairy sources include FAPRI, "U.S. Baseline Briefing Book," 2006 and 2010. Textile and apparel sources include Panteva, "Textile Mills in the US," 2010; Panteva, "Apparel Knitting Mills in the US," 2010; and Hewish, "Cut & Sew Apparel Contractors in the US," 2010.

TABLE E.1 Projected growth in macroeconomic variables, 2005–15, real percentage change

Macroeconomic variable	Projected real growth 2005–15
United States	
GDP	20.8
Consumption	23.0
Investment	1.2
Government expenditure	12.6
Exports	59.0
Imports	24.0
World	
GDP	56.0

Source: Commission estimates.

TABLE E.2 Observed and projected changes in imported quantities, selected sectors

Sector	2005–10 change (%)	2005–15 projected change (%)	Main sources of sectoral projections[a]
Dairy			
Butter	–6.1	–6.1	FAPRI projection
Cheese	–33.3	–27.9	FAPRI projection
Ethanol	42.7	888.4	RFS mandate
Sugar			
Raw sugar	0.1	4.3	Historical trend, Commission estimate
Refined sugar	141.2	221.4	Historical trend, Commission estimate
Tuna	–2.1	–2.0	Historical trend
Cigarettes	–57.6	–57.6	Historical trend
Textiles and apparel			
Yarn finishing	–38.0	–42.0	Historical trend, IBISWorld projection
Broad fabric	–34.7	–38.0	Historical trend, IBISWorld projection
Apparel	–6.0	12.0	Historical trend, IBISWorld projection

[a]See chapter 2 for specific sources for each industry.

Projections in other important sectors of the U.S. economy rely on trends and data specific to those sectors. For example, the growth in health-related sectors is assumed to be determined less by relative prices and other typical economic variables and more by demographic changes (particularly aging, population growth, and changes in morbidity rates) and technological change in medical services; data on these trends are sourced from agencies such as BEA and BLS. The analysis also uses sector-specific projections for energy sectors, using information on supply, production, consumption, prices, exports, and imports for sectors like coal, natural gas, petroleum, ethanol, and electricity. The world price of crude petroleum is particularly important, as it can substantially affect the U.S. trade balance and terms of trade. The energy sector data are sourced from the U.S. Department of Energy and the U.S. Energy Information Administration. The Commission incorporated the most recent sector-specific forecasts from 2010 or 2011, as it did with the macroeconomic components discussed above. These forecasts are revised periodically as new data become available. Updated values will generally have much larger effects on the projection than on the simulation results, because the effects of liberalization will generally be similar whether growth is high or low.[8]

[8] In USAGE, the effect of tariff liberalization on domestic output in the directly affected sector depends on Armington elasticities, the tariff cut, and imports as a share of GDP; only the import share can be affected by U.S. growth in the projection. If U.S. output growth is lower than assumed in the current projection, for example, then import share in some sectors may be lower than in the current projection, and tariff elimination would have slightly lower effects than reported in chap. 2.

The baseline incorporates trade policy adjustments expected to be made by 2015, such as changes to tariff rates and tariff-rate quota (TRQ) quantity allocations contained in the tariff staging schedules for U.S. free trade agreements (FTAs) and other trade agreements. These agreements provide the projected path of trade policy variables during the time horizon of the projection. For countries that do not have such agreements with the United States, 2015 tariff rates and TRQs are set equal to their 2010 values. The rest of the world is represented by 27 regions or countries that distinguish major U.S. trading partners, U.S. FTA partners, and countries with preferential trading agreements.[9]

Some key model inputs, such as changes in consumer preferences, are not observable in reported data or projections. Values for these components of the USAGE baseline come from simulation analysis of a historical period. By shocking a historical database with observed percentage-change data for a wide range of macroeconomic aggregates, production, price and volume variables, the model is able to endogenously produce model-consistent estimates of "unobservable" data. In addition to preferences, such variables include detailed technical change information, shifts in preferences between domestic and imported goods and services, and shifts in export demand and import supply functions.

Additional Data and Results

Tables E.3 to E.5 show detailed model data and results, and table E.6 presents the classifications of sectors discussed in chapter 2.

[9] Seventeen countries are included separately in the model: Australia, Bahrain, Brazil, Canada, Chile, China, Colombia, Israel, Japan, Jordan, Korea, Mexico, Morocco, Oman, Panama, Peru, and Singapore. The remaining countries in the world are included in one of 10 regions: Andean Trade Preference Act countries, Dominican Republic-Central America Free Trade Agreement countries, Caribbean Basin Economic Recovery Act countries, Caribbean Basin Trade and Partnership Act countries, the EU, GSP countries in the African Growth and Opportunity Act (AGOA), least developed GSP countries, least developed GSP countries in AGOA, the remaining GSP countries, and the rest of the world.

TABLE E.3 Initial model values, 2005 (millions of dollars)

Sector	Imports	Exports	Output	Employment[a]
Ethanol				
Corn-based ethanol	0	0	7,821	2,621
Cellulosic ethanol	0	0	20	9
Alternative feedstock ethanol	0	0	20	9
Sugar-based ethanol	410	0	1	1
Other ethanol	51	0	1	1
Dairy				
Butter	147	20	1,764	87
Dry dairy products	529	721	5,896	1,082[b]
Condensed dairy products	412	336	4,370	—
Fluid milk	28	88	26,497	4,048
Cheese	989	370	21,874	2,022
Ice cream	29	164	8,025	1,270
Tobacco				
Unmanufactured tobacco	695	1,413	4,190	799
Cigarettes	452	1,886	17,799	3,908
Cigars	424	35	299	146
Chewing and smoking tobacco and snuff	28	270	1,686	419
Sugar				
Sugarcane	0	1	991	86
Sugar beets	0	9	2,210	416
Raw cane sugar	638	141	1,628	215
Refined cane sugar	46	([c])	4,086	389
Refined beet sugar	23	([c])	3,865	741
All refined sugar	70	264	7,952	1,130
Tuna				
Tuna in oil	22	0	78	168[d]
Tuna in water	512	7	442	—
Other canned seafood	1,282	506	814	—
Commercial fishing	13,513	3,633	3,801	1,128
Fresh or frozen seafood	0	21	12,817	1,514
Canned specialties	177	151	7,150	1,164
Footwear and leather products				
Rubber and plastics footwear	9,324	511	722	267
Shoes, except rubber	20,895	685	1,017	397
Slippers	229	11	58	19
Leather gloves	559	6	78	41
Luggage	5,205	158	487	181
Women's handbags	2,396	227	374	155
Personal leather goods	1,114	33	407	136
Leather goods	670	146	317	133

[a]Wage bill for all employees within each industry.
[b]Includes condensed dairy products.
[c]Exports of refined cane and beet sugar are not modeled separately, but are reported under "all refined sugar."
[d]Includes all canned seafood.

TABLE E.3 Initial model values, 2005 (millions of dollars)—*Continued*

Sector	Imports	Exports	Output	Employment[a]
Textiles and apparel				
Broadwoven fabric mills	3,710	3,429	26,185	4,442
Narrow fabric mills	943	859	1,167	375
Nonwoven fabrics	799	1,328	4,664	825
Knit fabric mills	1,183	1,476	4,957	1,182
Yarn mills and textile finishing, n.e.c.	1,005	1,031	9,149	2,340
Thread mills	101	154	738	132
Carpets and rugs	2,171	1,005	15,330	2,053
Coated fabrics, not rubberized	607	374	1,947	426
Tire cord	371	111	1,097	163
Cordage and twine	242	75	804	210
Textile goods, n.e.c.	519	314	2,550	681
Curtains and draperies	1,178	61	1,599	647
House furnishings, n.e.c.	7,959	378	8,520	1,765
Textile bags	344	54	835	337
Canvas and related products	538	37	1,194	431
Pleating and stitching	171	108	1,028	407
Auto applique and trim	1	38	7,299	2,722
Embroideries	0	0	348	198
Fabricated textile products, n.e.c.	2,429	1,149	3,718	1,124
Women's hosiery, except socks	184	278	3,880	297
Hosiery, n.e.c.	1,379	142	1,116	496
Apparel excluding hosiery	84,839	5,559	35,425	5,787
Other high-tariff sectors				
Ball and roller bearings	3,101	1,339	7,133	2,812
Costume jewelry	2,796	245	2,189	664
Glass and glass products	4,654	3,407	19,359	5,723
Hand tools	2,209	656	7,074	2,343
Writing instruments	1,940	292	2,630	605
Pesticides and agricultural chemicals	1,378	2,649	10,984	1,917
China tableware	375	39	486	272
Earthenware	677	34	85	35
Ceramic tile	1,813	65	738	313
Tires	6,162	1,489	15,475	4,470

Note: n.e.c. means “not elsewhere classified.”

[a]Wage bill for all employees within each industry.

TABLE E.4 Effects of simultaneous liberalizations, 2005–15 (percent)

Sector	Change in quantity[a]			Change in employment[b]	Change in price	
	Imports	Exports	Output		Imports[c]	Household
Ethanol						
Corn-based ethanol	0.0	0.2	–5.6	–5.6	0.2	0.0
Cellulosic ethanol	0.0	0.0	0.0	(–)	0.2	0.0
Alternative feedstock ethanol	0.0	0.0	0.0	(–)	0.2	0.0
Sugar-based ethanol	44.4	0.0	0.0	0.0	–19.6	0.0
Other ethanol	0.1	0.0	0.0	0.0	0.2	0.0
Dairy						
Butter	52.0	4.3	–1.9	–2.0	–12.0	–1.2
Dry dairy products	59.2	2.0	–2.4	–2.8	–11.6	–0.4
Condensed dairy products	77.0	6.5	–5.1	–2.8	–16.9	–2.0
Fluid milk	35.8	1.3	–0.2	–0.3	–6.9	0.1
Cheese	64.2	12.0	–1.6	–1.6	–12.0	–0.5
Ice cream	23.5	0.5	–0.1	–0.2	–6.6	0.1
Tobacco						
Unmanufactured tobacco	79.7	5.4	–3.3	–3.6	–22.7	0.0
Cigarettes	7.2	1.8	0.1	–0.1	–3.8	–0.2
Cigars	(–)	2.1	0.5	0.4	(–)	(–)
Chewing and smoking tobacco and snuff	2.0	1.4	0.2	0.1	–1.0	–0.1
Sugar						
Sugarcane	0.0	71.6	–7.2	–7.4	0.2	0.0
Sugarbeets	0.0	22.4	–1.4	–1.5	0.2	0.0
Raw cane sugar	35.6	8.8	–7.4	–7.6	–14.1	0.0
Refined cane sugar	10.8	([d])	2.9	2.4	–3.7	([d])
Refined beet sugar	33.3	([d])	–1.6	–1.7	–6.2	([d])
All refined sugar	17.4	10.9	0.8	–0.2	–4.4	–0.9
Tuna						
Tuna in oil	52.0	16.9	–8.9	–6.6	–16.0	–3.7
Tuna in water	18.5	13.0	–8.1	–6.6	–9.2	–3.4
Footwear and leather products						
Rubber and plastics footwear	3.9	0.4	0.1	0.1	–9.9	–4.6
Shoes, except rubber	3.0	0.1	–0.2	–0.2	–7.7	–3.6
Slippers	3.8	0.4	–1.1	–1.0	–8.9	–3.7
Leather gloves	5.9	–0.7	–2.8	–3.0	–11.3	–5.7
Luggage	6.4	2.7	–5.9	–5.6	–11.0	–6.2
Women's handbags	4.9	0.4	–1.7	–1.7	–9.6	–5.0
Personal leather goods	6.6	3.1	–5.6	–5.6	–7.9	–3.4
Leather goods	–0.2	–2.0	–1.2	–1.5	0.2	0.2

[a]Change in constant 2005 dollars.
[b]Change in full-time equivalents.
[c]Change in landed duty-paid price.
[d]Exports and household price of refined cane and beet sugar are not modeled separately, but are reported under "all refined sugar."

TABLE E.4 Effects of simultaneous liberalizations, 2005–15 (percent)—*Continued*

Sector	Change in quantity[a]			Change in employment[b]	Change in price	
	Imports	Exports	Output		Imports[c]	Household
Textiles and apparel						
Broadwoven fabric mills	2.5	–52.8	–11.2	–11.5	–5.6	–1.2
Narrow fabric mills	–8.4	–19.9	–12.4	–12.5	–3.1	–0.9
Nonwoven fabrics	–4.6	–3.9	–1.4	–1.3	–0.1	0.1
Knit fabric mills	–13.9	–82.6	–31.9	–22.2	–6.6	–1.1
Yarn mills and textile finishing, n.e.c.	–8.0	–45.4	–20.9	–17.8	–5.1	–1.5
Thread mills	–0.7	–45.4	–10.6	–10.7	–3.3	–0.7
Carpets and rugs	0.8	–3.4	–0.5	–0.7	–1.3	–0.1
Coated fabrics, not rubberized	1.6	–2.6	–1.4	–1.3	–1.7	0.0
Tire cord	0.4	–9.9	–4.8	–5.2	–1.2	0.0
Cordage and twine	1.5	–14.9	–2.0	–1.9	–2.1	–0.1
Textile goods, n.e.c.	0.3	–5.5	–1.6	–1.4	–1.0	0.1
Curtains and draperies	4.4	–7.3	–3.4	–3.3	–8.3	–1.8
House furnishings, n.e.c.	1.5	–27.2	–2.4	–1.9	–5.9	–1.3
Textile bags	5.1	–23.8	–3.5	–3.4	–4.1	–0.7
Canvas and related products	4.8	–4.7	–2.4	–2.5	–5.2	–1.0
Pleating and stitching	0.8	–15.8	–2.4	–2.4	–4.5	–0.4
Auto applique and trim	–0.7	–28.8	–2.1	–2.1	0.2	–0.1
Embroideries	0.0	1.0	–2.0	–2.4	0.2	0.1
Fabricated textile products, n.e.c.	–0.3	–58.6	–14.8	–14.4	–3.9	–1.2
Women's hosiery, except socks	0.6	–81.5	–11.9	–11.7	–3.4	–0.6
Hosiery, n.e.c.	1.8	–81.7	–18.6	–14.6	–7.6	–3.0
Apparel excluding hosiery	2.2	–89.6	–16.1	–16.0	–8.8	–3.3
Other high-tariff sectors						
Ball and roller bearings	10.6	0.7	–3.7	–3.7	–5.1	0.0
Costume jewelry	4.9	1.1	–2.3	–2.3	–5.3	–1.7
Glass and glass products	5.6	4.0	(+)	(+)	–3.5	–0.4
Hand tools	2.0	0.2	–0.2	–0.2	–3.8	–0.6
Writing instruments	4.0	1.5	–1.7	–1.8	–4.4	–0.9
Pesticides and agricultural chemicals	3.1	1.6	0.1	0.1	–2.5	0.1
China tableware	10.0	0.5	–4.4	–4.4	–8.3	–1.5
Earthenware	1.3	0.5	–1.8	–1.7	–4.5	–2.1
Ceramic tile	2.4	0.6	–4.4	–4.4	–5.4	0.0
Tires	1.6	0.4	–0.3	–0.3	–2.0	–0.1

Note: n.e.c. means “not elsewhere classified.”

[a]Change in constant 2005 dollars.
[b]Change in full-time equivalents.
[c]Change in landed duty-paid price.

TABLE E.5 Effects of individual liberalizations, 2005–15 (percent)

Sector	Change in quantity[a]			Change in employment[b]	Change in price	
	Imports	Exports	Output		Imports[c]	Household
Ethanol						
Corn-based ethanol	0.0	(+)	–5.6	–5.7	(–)	0.0
Cellulosic ethanol	0.0	0.0	0.0	(–)	(–)	0.0
Alternative feedstock ethanol	0.0	0.0	0.0	(–)	(–)	0.0
Sugar-based ethanol	44.8	0.0	0.0	0.0	–19.8	0.0
Other ethanol	(+)	0.0	0.0	0.0	(–)	0.0
Dry corn milling	0.0	(+)	–5.6	–5.7	(+)	0.0
Wet corn milling	–0.1	3.0	0.1	0.2	(+)	0.0
Corn	–2.4	1.5	–1.4	–1.1	(–)	–0.4
Other feed grains	0.2	–0.1	(+)	–1.1	(+)	0.0
Dairy						
Butter	51.9	3.5	–2.0	–2.1	–12.1	–1.3
Dry dairy products	58.4	1.8	–2.4	–2.8	–11.6	–0.6
Condensed dairy products	75.7	6.1	–5.0	–2.8	–16.8	–2.1
Fluid milk	35.7	0.3	–0.2	–0.3	–6.9	(–)
Cheese	64.7	10.0	–1.6	–1.6	–12.1	–0.6
Ice cream	24.1	0.3	–0.1	–0.2	–6.8	–0.1
Tobacco						
Unmanufactured tobacco	72.8	4.8	–3.2	–3.4	–21.9	0.0
Cigarettes	7.3	1.6	0.1	–0.1	–4.0	–0.3
Cigars	(+)	1.9	0.4	0.3	–0.2	–0.2
Chewing and smoking tobacco and snuff	2.1	1.2	0.2	0.2	–1.1	–0.3
Sugar						
Sugarcane	0.0	51.2	–7.6	–7.7	(–)	0.0
Sugarbeets	0.0	10.0	–1.7	–1.7	(–)	0.0
Raw cane sugar	36.4	7.0	–7.7	–7.9	–14.2	0.0
Refined cane sugar	11.4	([d])	2.9	2.4	–3.8	([d])
Refined beet sugar	34.4	([d])	–1.7	–1.8	–6.4	([d])
All refined sugar	18.2	9.8	0.7	0.2	–4.6	–1.0
Tuna						
Canned tuna, oil-pack	52.1	16.8	–8.9	–6.6	–16.1	–3.9
Canned tuna, water-pack	18.5	12.9	–8.1	–6.6	–9.4	–3.5
Other canned seafood	0.9	–5.0	–3.3	–6.6	(+)	0.3
Commercial fishing	–0.6	(+)	(–)	(–)	(+)	(+)
Fresh or frozen seafood	0.0	–6.0	–0.1	–0.2	(+)	0.1
Canned specialties	(+)	–2.4	–0.1	–0.3	(+)	(+)
Footwear and leather products						
Rubber and plastics footwear	4.0	(+)	–0.2	–0.2	–10.0	–4.7
Shoes, except rubber	3.0	(+)	–0.2	–0.2	–7.9	–3.7
Slippers	3.9	0.6	–1.0	–1.0	–9.0	–3.8
Leather gloves	6.0	1.1	–2.3	–2.1	–11.4	–5.9
Luggage	6.5	2.4	–6.0	–5.7	–11.2	–6.3
Women's handbags	5.0	0.4	–1.8	–1.8	–9.8	–5.1
Personal leather goods	6.6	3.8	–5.3	–5.5	–8.0	–3.6
Leather goods	–0.1	–0.7	–0.4	–0.5	(+)	0.1

[a]Change in constant 2005 dollars.
[b]Change in full-time equivalents.
[c]Change in landed duty-paid price.
[d]Exports and household price of refined cane and beet sugar are not modeled separately, but are reported under "all refined sugar."

TABLE E.5 Effects of individual liberalizations, 2005–15 (percent)—*Continued*

Sector	Change in quantity[a]			Change in employment[b]	Change in price	
	Imports	Exports	Output		Imports[c]	Household
Textiles and apparel						
Broadwoven fabric mills	2.6	–52.8	–11.2	–11.5	–5.7	–1.2
Narrow fabric mills	–8.3	–20.0	–12.4	–12.6	–3.1	–1.0
Nonwoven fabrics	–4.6	–3.9	–1.4	–1.3	–0.1	(+)
Knit fabric mills	–13.7	–82.2	–31.7	–22.1	–6.7	–1.1
Yarn mills and textile finishing, n.e.c.	–7.9	–45.4	–20.9	–17.7	–5.2	–1.6
Thread mills	–0.6	–45.4	–10.5	–10.6	–3.4	–0.8
Carpets and rugs	0.8	–3.4	–0.5	–0.7	–1.4	–0.1
Coated fabrics, not rubberized	1.8	–2.7	–1.4	–1.2	–1.8	0.0
Tire cord	0.7	–10.0	–4.7	–5.0	–1.2	0.0
Cordage and twine	1.6	–14.9	–2.0	–1.8	–2.2	–0.2
Textile goods, n.e.c.	0.3	–5.5	–1.6	–1.4	–1.1	(+)
Curtains and draperies	4.4	–7.1	–3.3	–3.2	–8.3	–1.9
House furnishings, n.e.c.	1.5	–27.0	–2.4	–1.9	–6.0	–1.4
Textile bags	5.1	–23.4	–3.5	–3.3	–4.2	–0.8
Canvas and related products	4.8	–4.6	–2.4	–2.5	–5.3	–1.1
Pleating and stitching	0.8	–15.9	–2.4	–2.3	–4.6	–0.5
Auto applique and trim	–0.8	–28.4	–2.1	–2.1	0.1	–0.1
Embroideries	0.0	1.0	–2.0	–2.3	0.1	(+)
Fabricated textile products, n.e.c.	–0.3	–58.2	–14.7	–14.3	–4.0	–1.3
Women's hosiery, except socks	0.6	–81.0	–11.8	–11.6	–3.4	–0.7
Hosiery, n.e.c.	1.8	–81.0	–18.4	–14.5	–7.7	–3.1
Apparel excluding hosiery	2.2	–89.2	–16.0	–15.9	–8.8	–3.4
Other high-tariff sectors						
Ball and roller bearings	10.5	0.7	–3.8	–3.8	–5.3	0.0
Costume jewelry	5.1	1.0	–2.3	–2.3	–5.5	–1.9
Glass and glass products	5.7	3.4	–0.1	–0.1	–3.7	–0.6
Hand tools	2.0	0.1	–0.2	–0.2	–4.0	–0.8
Writing instruments	4.2	1.4	–1.6	–1.7	–4.5	–1.1
Pesticides and agricultural chemicals	5.2	0.9	–0.1	(–)	–4.0	–0.1
China tableware	10.1	0.5	–4.4	–4.3	–8.4	–1.6
Earthenware	1.4	0.4	–1.8	–1.7	–4.7	–2.3
Ceramic tile	2.4	0.5	–4.4	–4.4	–5.6	0.0
Tires	1.6	0.1	–0.4	–0.4	–2.2	–0.2

Note: n.e.c. means "not elsewhere classified."

[a]Change in constant 2005 dollars.
[b]Change in full-time equivalents.
[c]Change in landed duty-paid price.

TABLE E.6 Classification of imports, exports, shipments, and employment, by sector, in summary tables

Sector	Imports (HTS)	Exports (Schedule B)	Shipments (NAICS)	Employment (NAICS)
Ethanol for fuel use	2207.10.6000, 2207.20.0000, 2207.10.6010, 2207.20.0010	2207.10.6000, 2207.20.0000	325193	325193
Dairy				
Butter	0405	0405	31151N	31151N
Dry/condensed milk products	0402, 0403, 0404, 1702.11, 1702.19, 1901.10, 3501.90, 3502.20	0402, 0403, 0404, 1702.11, 1702.19, 1901.10, 3501.90, 3502.20	311514	311514
Fluid milk	0401	0401	31151N	31151N
Cheese	0406	0406	311513	311513
Ice cream	2105	2105	311520	311520
Tobacco				
Unmanufactured tobacco	2401	2401	312210	312210
Cigarettes	2402	2402	312221	312221
Sugar				
Farming				
Sugarcane farming	([a])	([a])	111930	111930
Sugar beet farming	([a])	([a])	111991	111991
Processing				
Sugarcane mills	([a])	([a])	311311	311311
Cane sugar refining	([a])	([a])	311312	311312
Beet sugar Manufacturing	([a])	([a])	311313	311313
Sugarcane	1212.99.0000	1212.99.0000	([a])	([a])
Sugar beets	1212.91.0000	1212.91.0000	([a])	([a])
Raw cane sugar	1701.11	1701.11	([a])	([a])
Refined cane and beet sugar	1701.19, 1701.99	1701.19, 1701.99	([a])	([a])
Tuna				
Tuna in oil	1604.14.10	1604.14.10	([b])	([b])
Tuna in water	1604.14.22, 1604.14.30	1604.14.22, 1604.14.30	([b])	([b])
	Imports (NAICS)	Exports (NAICS)		
Textiles and apparel				
Yarn, thread, and fabric	313	313	313	313
Other textile products	314	314	314	314
Apparel	315	315	315	315
Other high-tariff sectors				
Ball and roller bearings	332991	332991	332991	332991
Costume jewelry	339914	339914	339914	339914
Glass and glass products	3272	3272	3272	3272
Hand tools	332212	332212	332212	332212
Writing instruments	339941	339941	339941	339941
Pesticides and agricultural chemicals	325320	325320	325320	325320
Table and kitchenware	327112	327112	327112	327112
Ceramic tile	327122	327122	327122	327122
Tires	32621	32621	32621	32621
Footwear and leather products	3162, 3169	3162, 3169	3162, 3169	3162, 3169

[a]Not applicable.
[b]Estimated from fish industry testimony.

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