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Abstract

Although textile and apparel imports from most countries entered the United States quota-free after the expiration of the Agreement on Textiles and Clothing on January 1, 2005, substantial restraints remain on U.S. trade in these sectors. These restraints include high tariffs, quantitative restraints on some large exporters, and rules of origin that apply to duty-free imports from preferential trading partners. While there is a substantial literature on quotas and tariffs in these sectors, this paper provides a new and detailed examination of preferential rules of origin, including both compliance costs and rule-based foreign demand for U.S. textile and apparel inputs.

This paper uses the USAGE–ITC model to estimate U.S. welfare gains and sectoral effects of removing all textile and apparel restraints in 2005. Liberalization is estimated to increase U.S. welfare by $3.5 billion (net) while decreasing U.S. textile and apparel output by $11.0 billion. Eliminating only quantitative restraints provides over half of the welfare gain but causes less than 2 percent of the output loss, with a large decline in only the sock sector. Tariff elimination provides about one quarter of the welfare gain at a cost of 13.3 percent of the output loss, while elimination of preferential rules of origin accounts for the remaining 23.3 percent of increased welfare and 84.9 percent of the overall output reduction.

These results highlight the important effects of preferential rules of origin. While quantitative restraints had the largest effect on welfare, rules of origin had by far the largest effect on production and employment in these sectors. Further, nearly all quantitative restraints will expire by 2008, but preferential rules of origin will continue to affect U.S. import prices, exports, and economic welfare for the foreseeable future.

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1 Introduction

The framework for world trade in textiles and apparel was liberalized on January 1, 2005, when quotas were eliminated on all trade between WTO countries, as required by the Uruguay Round Agreement on Textiles and Clothing (ATC). Consequently, imports have increased in the U.S. market, particularly for apparel. From 2002 to 2005, U.S. imports of textiles and apparel increased 23.3 percent to $100.4 billion, while U.S. production and employment in these sectors declined by 11.0 percent and 23.0 percent respectively (table 1).

The United States continues to be the world's largest importer of textiles and apparel, and it accounted for 17.0 percent of world imports of these goods in 2005. This high value of imports occurred in spite of U.S. textile and apparel import restraints that are among the most restrictive in the U.S. economy. There were three important types of trade restraints in these sectors. First, although most quotas expired in 2005, substantial quantitative restraints remained for imports from China and Vietnam.[1] These countries were respectively the first and eighth largest exporters of textiles and apparel to the United States, so quantitative restraints remained important barriers to U.S. imports. Second, the expiration of the ATC did not affect textile or apparel tariff rates, which were among the highest of any U.S. product sector.[2] Third, preferential rules of origin (RoO) in textiles and apparel were among the most costly and influential of any U.S. RoO. These rules applied to the 28 percent of U.S. textiles and apparel that were imported duty-free from preferential trading partners, and we estimate that they generated over half of U.S. apparel exports in 2005.

To preview our results, although tariffs and quantitative restrictions were lower in 2005 than in previous years, the potential welfare gain from liberalization remained large. Complete liberalization of textiles and apparel is estimated to increase welfare by $3.5 billion, relative to the projected 2011 U.S. economy without liberalization. About 20 percent of the welfare gains from complete elimination of quotas are yet to be realized because of continuing restraints on Chinese and Vietnamese exports. And though nearly all quantitative barriers will expire by the end of 2008, tariffs and preferential RoO will remain. Comparing these two barriers, while they

[1] Additionally, some textile and apparel imports from Belarus and Ukraine, which are not WTO members, were subject to quotas. The Vietnamese quotas were eliminated upon its accession to the WTO on January 11, 2007.
[2] The trade-weighted average tariff rate in these sectors was 9.4 percent in 2005. USITC (2007) lists only the footwear, dairy, and canned tuna sectors as having higher tariffs.

are almost equally costly in terms of economic welfare, RoO have over six times greater impact on textile and apparel output because of their large effect on U.S. exports.

This paper is related to two strands in the literature. The first strand is the estimation of welfare effects from textile and apparel trade liberalization, as surveyed in Walkenhorst (2005). An early example of a computable general equilibrium (CGE) analysis is de Melo and Tarr (1990), which estimates that quotas reduced U.S. welfare by $18.0 billion in 1984. Reinert (1993) estimates that MFA quotas reduced U.S. welfare by $7.3 billion. Periodic U.S. International Trade Commission (USITC) estimates of potential welfare gains from textile and apparel liberalization (including both quotas and tariffs)[3] have similar magnitudes to the earlier studies: $7.4–11.3 billion in 1993, $10.4 billion in 1996, $13 billion in 1999, and $9–14 billion in 2002. In contrast, this paper estimates that barriers in 2005 reduced U.S. welfare by $3.5 billion.

Walmsley and Hertel (2000) examine the welfare effects of textile and apparel safeguards permitted in China's accession agreement to the WTO. They find that delaying the elimination of quantitative restraints on Chinese exports would reduce North American welfare (as well as Chinese and world welfare). Our paper supports that finding and estimates that the imposition of U.S. safeguards on Chinese exports in 2005 reduced U.S. welfare by $896 million. In addition, we find that U.S. quotas on Vietnamese exports (which expired in January 2007 upon Vietnam's WTO accession) reduced U.S. welfare by an even greater amount.

The second strand in the literature related to this paper concerns the costs and benefits of preferential RoO. These RoO are an important feature in U.S. preference programs and free trade agreements. RoO require eligible foreign trade partners to use U.S. or regional yarn and fabric inputs to qualify for duty-free access to the U.S. market. RoO provide benefits to the U.S. by creating demand for U.S. exports in these sectors. However, compliance with these rules also raises the cost of textiles and apparel exported to the United States. The prevalence of duty-free textiles and apparel imports highlights the importance of accounting for RoO in any analysis of trade liberalization.

A number of studies have examined overall RoO compliance costs for NAFTA. Anson et al. (2005) estimate that the average cost of NAFTA RoO in 2000 was 6.1 percent ad valorem. Carrère and de Melo (2004) argue that this overstates overall compliance costs, and use a more

[3] See USITC (1995, 1999, 2002, and 2004). Chapter 3 of USITC (2007) contains an earlier version of this paper.

sophisticated model to estimate that NAFTA compliance costs averaged only 3.0 percent. This estimate is in line with Cadot et al. (2005), who calculate that Mexican goods shipped to the United States in sectors eligible for NAFTA preferences are priced 4–5 percent higher than exports to non-preferential markets. Cadot et al. estimate that only half of this price differential (2–2.5 percentage points) is due to RoO compliance costs.

The compliance costs of textile and apparel RoO appear to be much higher than these average estimates. Anson et al. note that textiles and apparel have slightly below-average utilization rates but higher than average RoO restrictiveness, implying that the costs of RoO in textiles and apparel are higher than average. Carrère and de Melo (2004) support this assertion, estimating the average compliance cost to be 9.2 percent in these sectors, close to the average textile and apparel tariff preference rate of 10.4 percent.[4] They also find that technical operations, which require products to undergo specific manufacturing operations in the originating country, are the most costly type of RoO.[5] These technical operations apply to Mexican apparel but not textiles.

Our paper explicitly incorporates reduced prices for imported textiles and apparel and reduced foreign demand for U.S. goods as part of the liberalization scenario, accounting for two important features of preferential RoO absent in previous studies. This paper suggests that these outcomes of RoO policy are important in evaluating the welfare consequences of preferential RoO, as our estimates imply that RoO compliance costs are high enough to reduce aggregate U.S. welfare. These effects are even more important in understanding the effect of potential liberalization on sectoral activity: in sectors subject to preferential RoO, reductions in foreign demand account for 52–99 percent of the output reduction from liberalizing all restraints. Because these two forces have opposite effects on welfare and imports *and* reinforcing negative effects on exports, it is important to include them both.

This paper is organized as follows. Section 2 quantifies the restrictiveness of quantitative restraints, tariffs, and RoO, which provide price and quantity shocks for the liberalization scenario. Section 3 describes the model, and section 4 provides estimates of changes in welfare

[4] In detail, they estimate that RoO compliance cost are actually slightly higher than preference margins for sectors with positive but not complete preference utilization, and compliance costs average 61.7 percent of the preference margin in textile and apparel sectors with complete utilization.
[5] Their classification of RoO types was introduced by Estevadeordal (2000).

and sectoral activity from liberalizing the shocks quantified in section 2. This section also contrasts the welfare and sectoral impacts of liberalizing quantitative restraints, tariffs, and RoO separately. Section 5 concludes.

2 Restrictiveness of U.S. Import Restraints

2.1 Introduction

Trade in textiles and apparel in the United States has been subject to quantitative restriction since the 1960s to the present day, most notably under the terms of the Multifibre Arrangement (MFA, 1974-1994) and its successor, the Agreement on Textiles and Clothing (ATC, 1995-2005), established as part of the Uruguay Round negotiations.[6] ATC set as its goal the orderly elimination of quantitative restraints in textiles and clothing by January 1, 2005. The ATC succeeded in eliminating these quotas in 2005, although countries remain free to impose quotas on non-WTO countries.

China has been the largest beneficiary (by value) from global quota elimination and the resulting market share reallocation. Chinese exports to the United States rose from $12.8 billion to $27.7 billion between 2002 and 2005, an increase of 115.5 percent. This rapid increase led to the establishment of 10 safeguards (quantitative restraints) on selected imports of Chinese textile and apparel articles in 2005, as provided for under China's WTO Protocol of Accession. U.S. imports under these safeguards accounted for approximately 5.9 percent of all textiles and apparel from China in 2005.[7] All 10 safeguards filled at rates higher than 90 percent, and eight of the safeguards filled in their entirety, effectively preventing U.S. importers and retailers from receiving ordered goods.

Disruptions and uncertainties associated with the safeguards led to the negotiation of a Memorandum of Understanding (MOU), a three-year agreement that established quotas on U.S. imports of selected textile and apparel products from China. The MOU went into effect on January 1, 2006 and extends through December 2008, at which time the United States' right to invoke safeguards under the textile provision of China's WTO Membership Accession

[6] Spinanger (1999) describes the development and demise of the Multifibre Agreement and the ATC. He also provides historical trade data that detail the rise of China to world number one exporter of apparel by 1996.
[7] On a calendar year basis, total U.S. imports of the 10 categories subject to safeguards in 2005 represented 14.7 percent of total U.S. imports of textiles and apparel from China, but most safeguards were not in place for the entire year.

Agreement expires. The MOU established 21 quotas covering 34 categories of textile and apparel products (table 2), which accounted for 37.0 percent by value of imported Chinese textiles and apparel in 2005. Although the MOU covers more products, for most sectors that were subject to safeguards, the MOU allows higher quantities and higher annual growth rates than the minimums specified in the safeguard provision.

2.2 Nature of Quantitative Restraints

To export to the United States, a firm in a quota-constrained country must buy an export license or otherwise obtain the right to use a portion of the quota. Given that quotas impose a cost on exporting firms that is analogous to an export tax, one common way to measure the restrictiveness of a quota is to compute an export tax equivalent (ETE), which measures the degree to which the quota increases the export price. More restrictive quotas lead to more valuable export licenses, which in turn produce higher ETEs.[8]

We estimated ETEs for all Chinese safeguard sectors and all sectors in non-WTO countries that were subject to binding quotas in 2005. Using a quota fill rate of 90 percent to indicate a binding quota, exports were restrained in 10 sectors from China, 10 sectors from Vietnam, and one sector from Belarus (table 3).[9] Total imports under Chinese safeguards during the safeguard periods totaled $1,646 million, and imports in restrained sectors with non-WTO countries totaled $723 million; together these accounted for only 2.4 percent of total U.S. textile and apparel imports. The incidence of these quotas has declined significantly since the expiration of the ATC, and hence ETEs (and their economic importance to the United States) have also declined relative to earlier estimates. The ETEs, however, remain important to the countries with quantitative restrictions and to their foreign competitors.[10]

[8] As noted by Krishna and Tan (1997), large U.S. retailers, which increasingly source directly from foreign suppliers, may extract a portion of these rents. The extent of such rent sharing is unknown; however, these ETEs may overstate import price increases and associated welfare reductions in the U.S. economy.

[9] An alternative fill rate of 80 percent is sometimes employed in studies of trade restrictiveness. Using this alternative rate, only three additional sectors would be considered restrained. Because U.S. imports in these three sectors were low, the choice of fill rate has very little effect on trade-weighted ETEs and consequently has very little effect on the simulation results.

[10] In 2005, Chinese imports under safeguards were 5.9 percent of $27.9 billion c.i.f. total Chinese imported textiles and apparel; Vietnamese restrained imports were 24.3 percent of $3.0 billion; Belarusian restrained imports were 1.4 percent of $42 million; and none of the 65 million of Ukrainian imports were deemed restrained.

2.2.1 Chinese ETEs

Under the ATC, the Chinese government auctioned a portion of export licenses in each restrained sector, and these prices have been used in a number of studies to estimate ETEs. However, no export licenses were sold in 2005, because safeguards on Chinese imports were administered on a first-come-first-served basis. The Chinese government resumed its administration and auctions of export licenses under the MOU in 2006. Ten of the 21 MOU sectors were nearly identical to the corresponding 2005 safeguard sectors, so the January 2006 monthly average license prices were used as the best proxy for the 2005 license prices.[11] The per-unit production cost in each sector was estimated as the difference between the f.o.b. export price per unit to the United States and the per-unit price of an export license.[12] The ETE in each sector was calculated as the license price divided by the estimated production cost. Table 3 presents estimates of Chinese ETEs, which range from 6.5–93.3 percent. Because the sectors with the largest import volumes (cotton trousers, cotton shirts, and brassieres) have intermediate ETEs, the trade-weighted and unweighted averages are both about 42 percent.

2.2.2 Vietnamese ETEs

Vietnam does not report license prices, so the ETEs cannot be calculated as with China. In this case, the license price can be estimated as the difference between the export price and the production cost, if an estimate of the per-unit production cost in each sector is available. However, production costs are difficult to estimate and may differ from product to product and even factory to factory within a country. Trade journals estimate that Vietnamese production costs are 20–30 percent higher than Chinese costs for comparable products, although other industry sources estimate that Vietnamese costs are the same as Chinese costs in some industries.[13] Comparison to Chinese costs is further complicated by recent Vietnamese quality upgrading to avoid direct competition with low-cost commoditized goods from China. This quality upgrading is reflected by recently increasing Vietnamese unit values (table 3); in 2005

[11] License prices at the beginning of 2006 are likely to reflect the prices of 2005 licenses, had they been sold, because the set of restricted countries exporting to the United States did not change and the quota and MOU limits in 2006 are close to the quantities traded in 2005. January prices were used instead of the average prices in 2006 because prices in 2006 declined considerably after January, reflecting quota fill rates considerably below the levels seen in previous years. (The low fill rates indicate that some U.S. importers switched to non-Chinese sources, likely due to the uncertainty associated with the safeguards in 2005, although the initially higher quota prices indicate that importers were not able to change sources immediately.) The January license prices were typically slightly lower than average 2004 prices in comparable sectors.

[12] The f.o.b. price per unit is derived from official U.S. Customs data for customs value and quantity.

[13] See, for example, *Just-style* (2005).

these values were about 30 percent higher than Chinese unit values in comparable sectors. Because the portion of the Vietnamese-Chinese price differential attributable to rent capture, quality upgrading, and higher production costs cannot be reliably distinguished for each sector, we choose a cost value such that Vietnamese ETEs that are on average equal to Chinese ETEs for comparable products.[14] Table 3 presents estimates of Vietnamese ETEs, which range from 0 to 71.8 percent. Because the sector with the highest trade—cotton knit shirts—has the highest estimated ETE, and the sector with the lowest trade—synthetic filament fabric—has the lowest ETE, the trade weighted average of 43.9 percent is considerably higher than the unweighted average of 33.5 percent.[15]

2.2.3 ETEs in Model Sectors

The ETEs for individual restrained sectors must be combined to determine the ETE in each USAGE-ITC model sector. For each model sector, a trade-weighted average ETE is calculated using the ETE for each restrained subsector in that model sector, and an ETE of zero for all other trade in that sector.[16] Table 4 gives the ETE for each model sector along with trade-weighted average tariff rates. ETEs are considerably lower than tariff rates in all sectors except for socks.[17] The ETEs in 2005 are also considerably lower than those estimated in previous studies; for example, the current ETE for all textiles and apparel is less than one-third of the average ETE reported in USITC (2004). ETEs declined because the elimination of import quotas from most countries in 2005 as specified by the ATC considerably reduced the share of imports that were restrained by quotas.

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[14] This is equivalent to assuming that Vietnamese costs are 28 percent higher than Chinese costs. This cost differential is higher than the 10 percent differential assumed in USITC (2007), which relied more heavily on industry sources and minimized the role of quality differences. The higher cost differential leads to lower ETE estimates in the present paper, alhough these ETEs may still by overstated if greater-than average quality upgrading has occurred in sectors such as cotton knit shirts.

[15] Trade with Belarus is also restricted in one sector, heavyweight glass fiber fabric. To calculate this ETE, we assumed that Belarusian costs were 50 percent higher than Chinese costs in the glass fiber fabric MOU sector.

[16] The ETE in model sector k is calculated as $ETE_k = \sum_{i \in k} \sum_j (M_{ij} ETE_{ij}) / M_k$, where M_{ij} is the value of U.S. imports in restrained sector i from country j, and M_k is the value of U.S. imports in model sector k.

[17] The sock sector is officially denoted "hosiery, not elsewhere classified." In addition to socks, it includes three small hosiery sectors: nonsurgical, nonsynthetic-fiber pantyhose; tights without soles; and a few types of legwarmers. The "women's hosiery" sector includes all remaining types of pantyhose, tights, and legwarmers, and excludes socks.

2.3 Tariffs and RoO

Textiles and apparel imports are subject to some of the highest U.S. tariffs, although a substantial portion now enter duty free. The trade-weighted average ad valorem tariff on U.S. textile and apparel imports in 2005 was 9.4 percent (table 4). In general, tariffs on textiles and apparel increase with each stage of manufacturing (i.e., the duty rates are usually higher on apparel than on its yarn or fabric inputs). The trade-weighted average tariffs were 4.4 percent for textile mills, 6.4 percent for textile products, and 10.6 percent for apparel.[18] These average rates are not representative for many products and partners, however. Tariffs for many heavily traded apparel articles were much higher than these average tariffs.[19] Further, a significant portion of textile and apparel imports either enter duty free under FTAs and trade-preference programs or are eligible for a partial duty exemption under the production-sharing provisions of HTS chapter 98. In 2005, 28.0 percent of total U.S. textile and apparel imports entered duty-free.[20]

The prevalence of duty-free textiles and apparel imports highlights the importance of accounting for RoO in any analysis of trade liberalization.[21] In most textile and apparel sectors, imports must fulfill certain RoO criteria to enter free of duty. These criteria require the use of U.S. or regional fabric in the production of apparel items. RoO are influential in directing trade flows because they create demand for U.S. exports of textile articles for use in the production of apparel, which is then re-exported to the United States free of duty.

Although the United States granted preferential access to dozens of countries in 2005, most trade occurred with Mexico, Canada, CAFTA, and the Caribbean basin. These countries received 95.3 percent of U.S. textile and apparel exports to all preferential trading partners, or 74.7 percent of total U.S. exports of these goods. Not all of this trade is driven by RoO, however;

[18] These tariff values are based on the NAICS nomenclature. NAICS code 313 contains textile mills, which primarily include yarn, thread, and fabric mills. NAICS code 314 contains textile products, which include carpets and rugs, bed and bath linens, canvas products, rope and twine, tire cord, and other miscellaneous textile products. NAICS code 315 contains apparel, which includes knit-to-shape apparel as well as apparel assembled from cut fabric.

[19] For example, the 2005 Normal Trade Relations (formerly, MFN) duty rates on certain women's and girls' man-made fiber pants and blouses were 28.2 percent and 32.0 percent, respectively.

[20] The following are the largest suppliers of duty-free imports: NAFTA countries (36.0 percent of the total), United States–Caribbean Basin Trade Partnership Act countries (25.7 percent), African Growth and Opportunity Act countries (5.5 percent), and Andean Trade Promotion and Drug Eradication Act countries (5.1 percent). Goods entered under the production-sharing provisions of HTS chapter 98 accounted for an additional 18.4 percent of the duty-free value.

[21] We thank Andrea Boron for valuable assistance identifying RoO sectors, and Kim Freund for encouraging us to investigate textile and apparel RoO by highlighting implausible results in simulations that exclude them.

the prevalence and effects of RoO vary considerably by textile sector. RoO have the greatest effect on foreign demand for U.S. products in apparel and textile mill sectors, and have little effect on most textile products. Consultation with industry analysts, examination of FTA texts, and analysis of preferential trade patterns identified the following 10 sectors with significant preferential RoO: broadwoven fabric, narrow fabric, knit fabric, yarn mills, thread mills, coated fabric, pleating, women's hosiery, socks, and apparel.[22] Industry analysts estimate that RoO are responsible for 95 percent of U.S. exports to these partners in most of these sectors, which amounts to 44.3 percent of total U.S. textile and apparel exports.[23]

As noted in the introduction, RoO have high compliance costs, particularly for apparel products which face the most restrictive types of RoO. These costs are passed along to U.S. consumers when they buy imports from preferential trading partners. No studies exist that estimate compliance costs by detailed sector and trading partner. We estimate that compliance costs are equal to 40 percent of preferential tariff margins in textile sectors and 80 percent in apparel sectors.[24] This is a fairly conservative estimate because it is below Carrère and de Melo (2004) estimates for NAFTA compliance costs in most sectors, and because it does not accord any compliance cost to textiles that are re-exported to the United States in a non-RoO sector.[25] Further, we do not estimate compliance costs in non-textile-and-apparel sectors, because estimated RoO compliance costs are much lower in other sectors of the economy.

Examination of trade flows shows that preferential trading partners tend to have high exports to the United States, and thus high compliance costs, in the same sectors in which RoO

[22] We thank Kim Freund for valuable assistance identifying these sectors, and indeed, for encouraging us to begin this investigation of textile and apparel RoO by highlighting the implausible results of simulations that exclude them. Auto appliqué and trim is also subject to some RoO-based preferences, but this sector was not included because foreign producers rarely utilize these preferences, and only 1.1 percent of U.S. output in this sector is exported.
[23] Industry analysts noted that some textiles, particularly narrow fabric, have industrial uses that would generate trade even in the absence of RoO. Also, considerable trade with Canada, like U.S. apparel trade with other developed countries, would likely continue without preferential status. Thus we assume that RoO drive only 50 percent of U.S. exports in these sectors and partners.
[24] We also impose a 10 percent maximum compliance cost in all sectors. Because we use collected duties for FTA and non-FTA partners to calculate AVE preferential tariff rates, this procedure implicitly incorporates preference utilization rates. For example, because CBERA and CBTPA have relatively low utilization rates of knit fabric preferences, these countries' estimated compliance costs are lower than Mexican and Canadian costs in this sector.
[25] This choice also reflects calculations by Estevadeordal and Suominen (2006) that other U.S. FTA RoO are somewhat less restrictive than NAFTA RoO, although no compliance cost estimates are available for these other partners.

drive U.S. exports.[26] Table 5 summarizes the partners and sectors in which RoO generate U.S. exports, and the estimated compliance costs in these sectors.

3 Model Description

USAGE-ITC is the latest in a series of models developed by the Centre of Policy Studies and the Impact Project over the last 30 years, beginning with the ORANI model and moving through to the dynamic MONASH model of Australia.[27] The USAGE-ITC model is large scale, dynamic CGE model of the United States developed in collaboration with the U.S. International Trade Commission. USAGE-ITC is capable of conducting both static and dynamic CGE simulations, in the second case with recursive or forward-looking expectations. The dynamic components of USAGE-ITC involve, most importantly, the accumulation of various real and financial stocks and inter-temporal optimization by economic agents. USAGE-ITC distinguishes 523 commodities, 521 industries, 23 foreign regions, and a detailed handling of margins and taxes.[28] Other features of the model include a detailed modeling of government expenditures and foreign liabilities.

USAGE-ITC follows the MONASH approach to CGE in being designed to conduct several broadly-defined types of simulation analysis. *Historical simulations* estimate the paths of unobservable variables over a historical period, such as changes in technology and consumer preferences. *Forecasting simulations* generate baselines consistent with outside macroeconomic forecasts and model-consistent historical structural processes that are derived from the historical simulations. *Policy simulations* impose policy and other structural changes to calculate deviations from a forecast simulation baseline. In this paper, we report the results of both forecast and policy simulations. However, the historical simulation is essential to estimating trends that are applied to the forecast, as described below.

3.1 Generating the forecast and policy simulations

In creating a forecast for the period 2005–11, we first create a complete dataset with 2005 values. These data come from a number of sources. Production data are based on the 2005

[26] Except for CAFTA and Caribbean basin countries, which typically do not export upstream textile products (including thread, yarn, narrow fabric, and broadwoven fabric) back to the United States. When these countries do export these products to the United States, they typically receive the same tariff rate as non-preferential trading partners, leading to low estimated RoO compliance costs in these sectors with these partners.
[27] For more detail on USAGE as a MONASH style of model, see Dixon and Rimmer (2002).
[28] Changes in foreign economies are not modeled endogenously but the model does incorporate changes in foreign productivity and shifts in foreign demand and supply schedules based on historical trends.

national income and product accounts published by the Bureau of the Census and on the 1992 input-output accounts from the Bureau of Economic Analysis. Trade flows and U.S. tariff rates for 2005 come from the U.S. Department of Commerce. Foreign tariff rates come from the UNCTAD TRAINS database.

Then we apply shocks to exogenous variables to represent movements from their 2005 values to their forecast values for 2011. Some exogenous values are taken from forecasts made by U.S. government agencies, including the Bureau of Economic Analysis, the U.S. Department of Agriculture and the Energy Information Administration. A careful assessment is made to reconcile the macroeconomic forecasts with the model's structure and to determine the suitability of the forecasts themselves. For example, some of the macro forecasts implied a US current account deficit in excess of global savings within a decade of the start of the forecast period, a situation easily ruled out as unrealistic. Along with the macroeconomic forecasts, pre-negotiated or pre-announced trade policy changes are also included in the forecast. These include future tariff rates for U.S. free trade agreements, based on the final texts provided by the USTR.

Shocks to technology, consumer preferences, foreign supply, and foreign demand for U.S. products are derived from extrapolations in the historical simulation. The historical simulation is used to generate information about conventionally unobservable variables. The approach involves (a) exogenizing many of the naturally endogenous variables (i.e., those usually explained in a CGE model), (b) imposing shocks on these variables calculated from data provided by the historical record, and (c) endogenizing the otherwise naturally exogenous or unobservable variables, allowing them to accommodate these data. For example, given information such as historical movements in relative commodity prices and household disposable income, it is possible to make a model-consistent estimate of the implied movements in consumer preferences over the same period.

Policy simulations are conducted by perturbing USAGE-ITC away from the forecast path by shocking policy variables. The results we report are calculated as the deviation, in percentage terms, away from the dynamic baseline forecast.

3.2 Model details

3.2.1 Demand and production

Consumers use a three stage procedure to allocate expenditure across goods that are differentiated by country of origin. In the first stage, expenditure for each sector is determined by a linear expenditure system, without regard to the origin of goods.[29] In the second stage, consumers choose the relative expenditure on domestic and imported varieties of each good. The substitution possibility is specified with a constant elasticity of substitution (CES) parameter, commonly called the Armington elasticity. In the third stage, consumers allocate expenditure across multiple imported varieties, again with CES utility.

All sectors are assumed to be perfectly competitive. In the forecast, however, sector productivity may change due to exogenous shifts in a range of technological-change variables consistent with changes in the historical simulation. Firms engage in a multi-stage process that determines the relative expenditure on primary factors, domestic intermediates, and imported intermediates. Use of individual primary factors (labor, capital and land) is determined by a multi-level CRESH nesting structure. For each intermediate input, firms determine the expenditure on domestic and imported varieties using a CES function (the "Armington" approach). The primary factor bundle and the intermediate goods bundles are then combined to produce output using a CES function, for which parameters are chosen to allow very little substitution, resulting in a combination that is close to fixed proportions.

3.2.2 Primary factors

Capital stocks evolve with a lagged adjustment process driven by dynamic investment behavior. Firms that increase output in response to increased product demand also increase their demand for capital. In the current period capital is in fixed supply, as investment augments the capital stock with a lag of one period. In response to the increase in demand for capital, the rental price of capital rises which, ceteris paribus, leads to an increase in the expected rate of return on capital. Larger expected rates of return lead to an increase in investment as the firm attempts to increase the rate of capital accumulation with the objective of reducing the scarcity of capital in the subsequent period. Furthermore, investors' required rates of return are an increasing function of capital growth, reflecting risk aversion by suppliers of investment funds.

[29] The linear expenditure system allows consumers to change their relative preferences for goods and services at different levels of income.

Labor is affected by population change and labor supply decisions. Adjustments in employment and wage rates in the policy simulation are driven by a sluggish adjustment mechanism. Wages rise if the path of employment in the policy simulation rises above its path in the forecast. Wages, however, are "sticky" so that adjustment occurs relatively slowly, leading to periods of sustained excess demand or supply in labor markets.

The aggregate quantity of land is fixed in all periods, but the rental price can change according to changes in demand.

3.2.3 Balance of payments and trade

Changes in the balance of payments are also driven by trends in the historical simulation. In our forecasts for 2005 to 2011, we assume that total U.S. foreign assets will grow in relation to U.S. GDP in the same way as it did between 1998 and 2005. With accumulation of foreign assets fixed relative to GDP, our forecast for change in total U.S. foreign liabilities is determined largely by current account deficits, which are, in turn, determined largely by exports and imports and by dividend and interest payments on debts, credits and equities. In our forecasts for 2005–11, we assume that interest rates on all U.S. credits and debts will remain at their 2005 levels. Interest, dividend and revaluation rates for U.S. foreign assets and liabilities are treated exogenously, and changes for these variables in the 2005–11 forecast are derived from extrapolations from the 1998–2004 historical simulations.

USAGE recognizes 23 distinct foreign regions in trade. Each region includes an individual country or a group of countries to which the United States applies similar preferential trade policies. Inter-regional choice in exports and imports is handled by a CRESH nest that sits below the Armington nest. Variables that do not relate directly to goods trade are not split into multiple regions, but are distinguished only as domestic or foreign. This applies, for example, to international investment flows that feed into the evolution of the capital account in the balance of payments.

4 Effects of Liberalization

4.1 Liberalization exercise

The simulation exercise proceeds in two steps. First, recent national, international, and industry trends are used to produce a baseline projection of the U.S. economy from 2005 to 2011. This projection is used to illustrate the size of changes that would likely occur in the economy in

the absence of changes to U.S. trade policy related to textiles and apparel. The baseline includes all pre-negotiated trade policy changes, such as the staging of tariff rates with FTA partners. However, to better quantify the effects of quantitative restraints, the December 2008 expiration of Chinese quantitative restraints and the January 2007 removal of Vietnamese quantitative restraints have been excluded from the baseline. This allows welfare and sectoral effects of quantitative restraints to be analyzed with tariffs in the liberalization scenario.

Second, the model is used to simulate the removal of all import restraints in textiles and apparel. The results of this liberalization are presented as deviations from the projected trends. This liberalization has a number of components: it contains the elimination of all textile and apparel quantitative restraints and associated ETEs as well as duty-free access for all goods in these sectors; it also contains a new and detailed analysis of textile and apparel RoO, and includes reductions in RoO-driven foreign demand for U.S. textile inputs and elimination of RoO compliance costs. Table 6 compares the magnitude of each type of liberalization in terms of reductions in import prices and reduction in foreign demand.

4.2 Projected Industry Trends

The USAGE-ITC model estimates that household demand for all textiles and apparel would increase by 23.6 percent in the period from 2005–11 in the absence of any changes to U.S. trade policy. This demand increase for textiles and apparel is higher than the estimated 20.8 percent increase in real consumption of all goods. However, the demand increase is not matched by an increase in domestic production, as overall textile and apparel output is expected to decline. Many sectors contract outright, and only two (narrow fabric and coated fabric) increase output by more than the projected GDP increase of 21.7 percent (table 7).[30]

The projected decline in employment of 36.0 percent is much greater than the contraction in output, partly because the trend toward more capital intensive production is expected to continue.[31] Exports are projected to increase in about half of the sectors, but only three sectors (broadwoven fabric, knit fabric, and pleating) would exceed the expected overall U.S. export

[30] Narrow fabric is extremely export oriented and would benefit from the projected devaluation of the U.S. dollar. The increase in coated fabrics is driven by a projected increase in several downstream sectors, including office furniture.

[31] The U.S. industry is expected to further concentrate in higher-quality, higher-performance products that are generally more capital and research intensive, and face less competition from more commoditized products from low-wage countries (Center on Globalization, Governance, and Competitiveness, 2006).

increase of 39.9 percent.[32] Imports in textile and apparel sectors are generally projected to increase, with the largest estimated increase in imports found in coated fabrics.

4.3 Deviations from Projected Trends

Liberalization of textiles and apparel would increase welfare in 2011 by $3,470 million dollars compared to the baseline simulation (table 8). Efficiency gains from the removal of tariffs would improve welfare by $830 million, and the elimination of quantitative restraints would increase welfare by $1,889 million, of which $895 million is due to Chinese quantitative restraints and $974 million is due to Vietnamese quotas. Vietnamese restraints have a larger effect on welfare, despite affecting a smaller share of U.S. imports, because Vietnamese ETEs are highest in the most heavily traded sectors. Overall, the removal of textile and apparel preferential RoO would increase welfare by $818 million, but the effects of the reductions in compliance costs and foreign demand are quite different. Foreign demand reductions would reduce U.S. welfare by $714 million because of reduced U.S. exports, but this is more than offset by a $1,532 million gain from the elimination of compliance costs in imported textiles and apparel.

The changes in GDP for each type of liberalization are smaller than the changes in welfare, in general because the import values increase more than exports. Changes in imports and exports across liberalizations also cause the magnitude of GDP changes to diverge from the welfare effects. For example, elimination of Vietnamese quotas increases GDP considerably more than does the elimination of Chinese quantitative restraints, although these liberalizations have roughly similar welfare effects. Because China is a larger trade partner, the elimination of Chinese quantitative restraints results in a correspondingly larger increase in imports and a smaller increase in GDP. The biggest differences between the welfare and GDP results occur in the RoO liberalization scenarios, in which welfare increases but GDP declines relative to the baseline. Foreign cost reductions increase consumer expenditure, increase imports, and reduce exports. Foreign demand reductions reduce U.S. exports, reduce consumer expenditure, and decrease U.S imports because U.S. textile and apparel prices decline. The relatively large

[32] These sectors share several characteristics that enhance their export competitiveness. Broadwoven and knit fabric are export oriented, and knit fabric and pleating have expected price decreases in the forecast period. Knit fabric would also benefit from a projected increase in foreign demand.

declines in export dominate, so the combined effects of these RoO-related changes on GDP are negative.

The removal of barriers in textiles and apparel trade has a relatively minor effect on other macroeconomic variables. Table 9 shows that employment, production, imports, and exports change by 0.1 percent or less as a result of liberalization, relative to the 2011 baseline projection. This, in large part, reflects the relatively small share of the US textiles and apparel sector in US GDP, and the fact that these sectors are characterized by a higher-than-average labor share in production, allowing reallocation of primary factors to occur relatively quickly.

Table 9 also reports the sectoral effects of liberalization. These effects are chiefly determined by the incidence of preferential RoO. In the 12 sectors that are not subject to preferential RoO, the expected changes from the policy liberalization are small relative to the projected changes based on industry trends.[33] In these sectors, liberalization would cause small declines in domestic output and employment and a small increase in imports, relative to the 2011 baseline projection. Liberalization would also result in a domestic price decline, which would increase U.S. exports by making them more competitive in world markets.

In contrast, liberalization is estimated to sharply reduce exports in the 10 sectors in which domestic production is encouraged by U.S. preference programs and FTAs, chiefly because foreign demand would decline for these exports.[34] Although these 10 sectors exhibit large declines in exports, the effect on production varies and depends primarily on the export orientation of the sector.[35] The women's hosiery sector is the least export oriented, and it shows the smallest decline in output (3.0 percent) relative to the baseline projection. Conversely, narrow fabric is the most export oriented of these sectors, and exhibits the largest decline in output (38.7 percent). The decline in employment for these sectors is generally close to the

[33] These 12 sectors include nonwoven fabric, carpets, tire cord, cordage, textile goods n.e.c., curtains, house furnishings n.e.c., textile bags, canvas products, auto appliqué and trim, embroideries, and fabricated textile products n.e.c.
[34] Table 5 lists the products and trading partners affected by significant preferential RoO.
[35] Export orientation is the percentage of U.S. output that is exported. In sectors with RoO-based preferences, export orientation ranges from 1.7 percent for the women's hosiery sector to 87.6 percent for the narrow fabric sector.

decline in output.[36] The estimated effect on other textile and apparel sectors due to the decline in RoO-based foreign demand is minor.

Aside from textiles and apparel, only five other sectors are expected to experience changes in output of at least one percent as a result of the liberalization. Affected upstream sectors include cotton, textile machines, and two man-made fiber sectors. Employment and imports in these sectors are expected to decrease because liberalization would reduce domestic textile and apparel output. In contrast, the effects on downstream sectors are expected to be positive but small, with only public building furniture estimated to expand output by more than one percent as the prices of textile inputs decline.[37]

4.4 Relative impact of removing quantitative restraints, tariffs, and RoO

Examining tariffs, quotas, and preferential RoO separately, the effects of liberalization can be consistently ranked: in nearly every sector. the liberalization of tariffs has a greater estimated impact than the liberalization of quotas, but both of these effects are small compared to the effect of removing RoO-based foreign demand and compliance costs. The relative impacts of eliminating quotas, tariffs, and preferential RoO are well illustrated by comparing the effects of each type of liberalization on output (table 10).

The removal of quotas would have the least effect on output: this liberalization would change output by less than 0.5 percent in all sectors except socks, for which Chinese quantitative restraints are particularly binding. The removal of tariffs would have a larger effect on output, with textile mill products most adversely affected. Although textile products and apparel would be subject to larger tariff removals than mill products, the reduction in output in non-mill sectors

[36] The employment change is similar to the output change in all sectors except house furnishings and women's hosiery. In house furnishings, employment increases by 8.2 percent while production declines by 0.2 percent. This result occurs because 21.1 percent of house furnishings are produced by workers in the broad fabric sector. The large contraction in the broad fabric sector sharply reduces production of house furnishings by workers in the broad fabric sector; thus employment in the house furnishings industry must increase even though the combined output in the house furnishings sector contracts slightly. Similarly, 55.0 percent of the output of women's hosiery is produced by workers in the sock sector. Even though output of women's hosiery contracts slightly, employment in the women's hosiery industry must increase to make up for a dramatic decrease in women's hosiery output by sock industry workers.

[37] The outputs of two other sectors, nonferrous ores and the export of education sector, which consists of the expenses of foreign students in the United States, also increase by more than one percent. Although they are not upstream or downstream sectors, their output expands because the small estimated decline in the exchange rate that results from liberalization promotes exports in these two sectors. They are among the most export-intensive of all U.S. sectors (82.4 and 100.0 percent of the output of these sectors is exported, respectively).

would be smaller because downstream users would benefit from cheaper fabric inputs after liberalization.

The elimination of RoO-based costs and foreign demand would have the largest effect on output in most sectors. In the textile sectors subject to preferential RoO, reduction in foreign demand accounts for at least 85 percent of the total reduction in output. In apparel sectors, tariffs and ETEs are higher and account for more of the output decline than in textiles, but the elimination of preferential RoO still accounts for at least 50 percent of the output decline in apparel.

Consistent with the textile and apparel results, upstream sectors are also more affected by the elimination of RoO-based foreign demand than by the elimination of tariffs or quotas. In these sectors, foreign demand reduction accounts for at least 80 percent of the output decline in each case. The downstream sector, public building furniture, is less affected by RoO and experiences a smaller overall change in output.

Examining the effect of liberalization on exports further highlights the effect of preferential RoO (table 11). The liberalization of quantitative restraints and tariffs both lead to small estimated increases in U.S. exports due largely to declining U.S. production prices. In contrast, elimination of RoO-based compliance costs and foreign demand leads to very large estimated export reductions in sectors directly affected by preferential RoO. The magnitude of the RoO based export effects are between 13 and 291 times larger than the combined effect of tariffs and quantitative restraints.

5 Conclusion

This paper has analyzed the effect of textile and apparel import barriers and regulations on U.S. welfare and sectoral activity. We find that the effects of quantitative restraints have declined after the ATC, although remaining quantitative measures in 2005 still imposed about 20 percent of the welfare cost estimated in pre-2005 studies of these barriers. Tariffs in these sectors remained high and continued to reduce welfare. This paper includes a new and careful examination of preferential RoO in these sectors, and finds that the effect of compliance costs is substantial for U.S. economic welfare, and that the effect of foreign demand is substantial for textile and apparel output, trade, and employment.

The effect of elimination of quantitative restraints, tariffs, and preferential RoO differ markedly in their effect on welfare and other macroeconomic variables. Overall, liberalization of textile and apparel barriers and RoO is estimated to increase U.S. welfare by $3.4 billion while decreasing U.S. textile and apparel output by $11.0 billion. Eliminating only quantitative restraints would provide over half (53.1 percent) of the welfare gain but would cause very little (1.7 percent) of the output loss, except in socks. Tariff elimination would provide 23.6 percent of the welfare gain at a cost of 13.3 percent of the output loss. RoO elimination would account for the remaining 23.3 percent of increased welfare but a whopping 84.9 percent of the overall output reduction.

The results highlight the large effects preferential textile and apparel RoO have on both U.S. welfare and sectoral activity, and reinforce the importance of accounting for both RoO-based compliance costs and RoO-based foreign demand. Welfare losses from RoO compliance costs are large, and are only slightly less than the losses from all remaining quantitative restraints. On the other hand, RoO-based foreign demand generates substantial U.S. textile and apparel output. Sectoral results shows that the reduction in foreign demand following the loss of RoO-based tariff preferences would result in U.S. sectoral output declines that are 2–15 times greater than declines due to liberalization of tariffs and quantitative restraints. The effects on exports are even more dramatic, with sectoral RoO effects between 13 and 291 times as large as tariff and quantitative effects combined.

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Table 1 Textiles and apparel: Summary data, 2002–5

	2002	2003	2004	2005	2002–5 percent change
Shipments (billion dollars)					
Total textiles and apparel	131.0	128.0	118.3	116.6	-11.0
Textile mills	43.2	39.8	43.4	40.6	-6.0
Textile products	34.2	35.2	33.3	34.3	0.2
Apparel	53.6	53.0	41.6	41.7	-22.2
Employment (production workers, thousands)					
Total textiles and apparel	845.2	752.9	698.1	650.4	-23.0
Textile mills	290.9	261.3	236.9	217.9	-25.1
Textile products	194.6	179.3	175.7	172.3	-11.5
Apparel	359.7	312.3	285.5	260.2	-27.7
Imports (billion dollars)					
Total textiles and apparel	81.4	87.2	94.2	100.4	23.3
Textile mills	7.1	7.2	7.8	7.9	10.6
Textile products	9.2	10.5	12.6	14.5	57.9
Apparel	65.2	69.5	73.8	78.0	19.8
Exports (billion dollars)					
Total textiles and apparel	14.7	14.4	14.8	14.9	1.0
Textile mills	7.4	7.6	8.4	8.5	14.5
Textile products	1.9	1.9	2.1	2.3	25.0
Apparel	5.5	4.9	4.3	4.1	-25.5

Source: Official statistics of the U.S. Department of Commerce (USDOC) and the U.S. Department of Labor.

Note: Values are for NAICS codes 313, 314, and 315, which include textile mills, textile products, and apparel, respectively.

Table 2 Imports of Chinese textiles and apparel in 2005, and MOU limits for 2006–8, by MOU category, million units

Category	Imports	MOU limits		
	2005	2006	2007	2008
Sewing thread, combed cotton yarn (cat. 200/301, in kilograms)	7.0	7.5	8.7	10.1
Knit fabric (cat. 222, in kilograms)	18.3	16.0	18.4	21.5
Special purpose fabric (cat. 229, in kilograms)	28.9	33.2	38.5	45.0
Hosiery, including baby socks (cat. 332/432/632T, in dozen pairs)	62.3	64.4	74.0	85.1
Cotton knit shirts and blouses (cat. 338pt/339pt, in dozens)	20.4	20.8	23.4	26.9
Woven shirts, men's and boys' (cat. 340/640, in dozens)	6.2	6.7	7.6	8.7
Sweaters (cat. 345/645/646, in dozens)	7.8	8.2	9.2	10.7
Cotton trousers (cat. 347/348, in dozens)	18.3	19.7	22.1	25.4
Brassieres (cat. 349/649, in dozens)	21.2	22.8	25.6	29.5
Underwear (cat. 352/652, in dozens)	18.0	18.9	21.3	24.5
Swimwear (cat. 359S/659S, in kilograms)	5.9	4.6	5.2	6.0
Pile towels (cat. 363, in numbers)	85.2	103.3	116.2	134.8
Wool suits, men's and boys' (cat. 443, in numbers)	1.6	1.3	1.5	1.8
Wool trousers, men's and boys' (cat. 447, in dozens)	0.2	0.2	0.2	0.3
Polyester filament fabric (cat. 619, in square meters)	53.8	55.3	62.2	72.2
Other synthetic filament fabric (cat. 620, in square meters)	77.4	80.2	90.2	103.8
Glass fiber fabric (cat. 622, in square meters)	30.3	32.3	37.1	43.4
Man-made fiber knit shirts (cat. 638pt/639pt, in dozens)	9.2	8.1	9.1	10.4
Man-made fiber trousers (cat. 647pt/648pt, in dozens)	7.4	8.0	9.0	10.3
Window blinds, window shades (cat. 666pt, in kilograms)	1.1 [a]	1.0	1.1	1.3
Silk-blend or noncotton-vegetable-fiber trousers (cat. 847, in dozens)	15.7	17.6	19.9	23.0

Source: Official statistics of the USDOC. Concordances from HTS to MOU categories are available in USDOC, "U.S. Textile and Apparel Category System"; and Committee for the Implementation of Textile Agreements (2005).

Note: Units are as specified in the MOU.

[a] To estimate 2005 imports in category 666pt, it was assumed that the ratio of blinds and shades imports to curtain imports in HTS 63031200 and 63039220 was unchanged in 2005–6.

Table 3 Restrained U.S. imports: change in imports, change in unit value, tariff rates, and ETEs, 2002–5

Country and sector	Change in imports, 2002–5[a]	Change in unit value, 2002–5[a]	Tariff rate, 2005[b]	ETE, 2005
China				
Combed cotton yarn (cat. 301, in kilograms)	138.7	5.3	8.7	6.5
Hosiery (cat. 332/432/632pt, in dozen pairs)	565.2	-27.4	13.3	93.3
Cotton knit shirts and blouses (cat. 338/339, in dozens)	214.9	-59.7	15.5	57.6
Woven shirts, men's and boys' (cat. 340/640, in dozens)	94.1	-22.0	21.2	33.5
Cotton trousers (cat. 347/348, in dozens)	239.6	-49.0	15.4	38.6
Brassieres (cat. 349/649, in dozens)	82.0	-9.7	16.3	23.3
Underwear (cat. 352/652, in dozens)	110.4	-48.5	11.7	64.8
Other synthetic filament fabric (cat. 620, in square meters)	380.6	-57.5	9.3	35.3
Man-made fiber knit shirts (cat. 638/639, in dozens)	113.4	-41.4	29.2	34.5
Man-made fiber trousers (cat. 647/648, in dozens)	52.5	-34.8	22.6	33.1
Vietnam				
Cotton coats (cat. 334/335, in dozens)	129.9	62.2	10.5	25.7
Cotton knit shirts (cat. 338/339, in dozens)	153.7	11.1	16.2	71.8
Woven shirts, men’s and boys’ (cat. 340/640, in dozens)	260.4	26.5	20.5	31.1
Woven shirts, women’s and girls’ (cat. 341/641, in dozens)	141.0	16.9	17.5	31.1
Cotton and man-made fiber skirts (cat. 342/642, in dozens)	129.4	12.5	10.7	25.7
Cotton trousers, slacks, and shorts (cat. 347/348, in dozens)	127.6	23.9	15.4	25.7
Swimwear (cat. 359S/659S, in kilograms)	854.7	94.2	23.1	68.4
Other synthetic filament fabric (cat. 620, in square meters)	21.0	16.8	1.3	0.0
Man-made fiber knit shirts (cat. 638/639, in dozens)	163.0	41.5	29.7	28.6
Man-made fiber trousers (cat. 647/648, in dozens)	154.9	55.8	22.5	27.4
Belarus				
Heavy weight glass fiber fabric (cat. 622N, in square meters)	-34.1	28.3	6.7	91.2

Source: Official statistics of the USDOC and USITC estimates.

[a] Percentage changes.

[b] Based on the trade-weighted c.i.f. value of imports from each country (including both dutiable and duty-free imports).

Table 4 ETEs and average tariff rates on imports of textiles and apparel, percent, 2005

Sector	Average tariff rate[b]	ETE[a]		
		China	non-WTO	Total
All textile and apparel	9.4	0.79	0.77	1.56
Textile mills	4.4	0.04	0.00	0.04
Broadwoven fabric mills	6.8	0.10	0.02	0.12
Narrow fabric mills	3.7	—	—	—
Nonwoven fabric mills	0.5	—	—	—
Knit fabric mills	7.6	—	—	—
Yarn mills and textile finishing n.e.c.	6.7	0.06	—	0.06
Thread mills	4.4	—	—	—
Carpets and rugs	1.6	—	—	—
Coated fabrics, not rubberized	2.4	—	—	—
Tire cord	1.3	—	—	—
Cordage and twine	2.5	—	—	—
Textile goods n.e.c.	2.0	—	—	—
Textile products	6.4	—	—	—
Curtains and draperies	9.3	—	—	—
House furnishings n.e.c.	6.7	—	—	—
Textile bags	4.6	—	—	—
Canvas and related products	6.0	—	—	—
Pleating and stitching	6.1	—	—	—
Fabricated textile products n.e.c.	4.4	—	—	—
Apparel	10.6	1.01	1.00	2.02
Women's hosiery	4.0	—	—	—
Socks	8.8	16.46	—	16.46
Apparel made from purchased materials	10.7	0.76	1.02	1.78

Source: Official statistics of the USDOC and USITC estimates.

[a] A dash indicates there were no quantitative restraints in a given sector.

[b] Based on trade-weighted c.i.f. values of imports (including both dutiable and duty-free imports). Only sectors with positive import values in 2005 are listed.

Table 5 Sectors subject to foreign demand reductions and associated RoO compliance costs

Sector	Estimated Compliance Cost					ROW AVE tariff rate[a]
	Mexico	Canada	CAFTA	CBERA	CBTPA	
Textile mills and products						
Broadwoven fabric mills	3.7	—	2.8	0.0	0.4	9.4
Narrow fabric mills	0.8[b]	0.9[b]	1.1	—	—	4.9
Knit fabric mills	4.5	4.5	—	2.2	0.8	11.3
Yarn mills and textile finishing n.e.c.	3.7	1.9[b]	1.2	0.8	3.7	9.3
Thread mills	3.8	2.0[b]	0.1	4.1	0.0	10.2
Coated fabrics, not rubberized	1.6	—	—	1.6	1.3	4.0
Pleating and stitching	2.3	—	—	—	—	5.9
Apparel						
Women's hosiery	10.0	—	10.0	—	10.0	14.5
Socks	10.0	—	9.0	0.5	0.3	13.2
Apparel made from purchased materials	10.0	—	9.8	6.9	10.0	17.0

Note: A dash indicates that no compliance cost was estimated or removed in the simulation; similarly, no foreign demand reduction was applied in the simulation in these sectors.

[a] The ROW AVE tariff rate is equal to collected duties divided by the c.i.f. import value from all countries without preferential access.

[b] To account for non-RoO-driven use in these sectors, compliance costs were set to 20 percent of the preferential tariff rate, and a 50-percent foreign demand reduction was applied in the simulation.

Table 6 Summary of liberalization effects on import prices and foreign demand

Broad Sector	Tariffs: AVE	Quantitative Restraints: ETE	RoO	
			Compliance Cost: ETE	Foreign demand: percent reduction
Textile Mills	4.4	0.0	0.3	47.6
Textile Products	6.4	—	0.0	6.3
Apparel	10.6	2.0	1.8	50.8

Note: A dash indicates that a sector was unaffected by a liberalization; 0.0 indicates that sectors were affected, but by less than 0.05 percent.

Table 7 Projected percent change in textile and apparel sectors without liberalization, 2005–11

Sector	Employment	Output	Imports	Exports	Household price[a]
All textile and apparel	-34.9	-7.4	38.0	2.9	3.3
Textile mills	-30.9	2.3	9.8	26.9	4.4
Broadwoven fabric mills	-27.6	4.3	10.5	44.4	4.0
Narrow fabric mills	-17.8	23.0	-10.4	34.1	2.9
Nonwoven fabric mills	-35.0	-0.7	0.5	-12.5	1.6
Knit fabric mills	-55.7	-13.0	14.4	44.1	0.7
Yarn mills and textile finishing n.e.c.	-30.3	-10.1	-10.7	34.2	5.1
Thread mills	-37.1	-15.7	0.5	-6.1	4.2
Carpets and rugs	-26.3	7.4	8.3	-15.7	5.2
Coated fabrics, not rubberized	-15.3	22.0	57.1	26.3	8.0
Tire cord	-30.8	4.2	24.8	-28.9	7.9
Cordage and twine	-26.4	7.1	31.9	-7.7	4.2
Textile goods n.e.c.	-29.6	9.2	13.8	-32.1	4.7
Textile products	-28.7	-1.3	28.8	21.3	3.8
Curtains and draperies	-31.4	0.7	5.6	38.4	2.6
House furnishings n.e.c.	-32.2	-1.7	31.1	15.0	4.7
Textile bags	-28.1	-1.9	34.0	27.6	4.7
Canvas and related products	-31.0	-1.4	15.0	-22.4	3.8
Pleating and stitching	-30.1	2.0	0.9	71.3	2.0
Auto appliqué and trim	-23.8	-1.6	—[c]	33.6	7.2
Embroideries	-33.7	-10.7	—[c]	1.9	3.2
Fabricated textile products n.e.c.	-32.1	-0.6	36.9	20.8	3.3
Apparel	-53.4	-29.6	42.9	-39.1	-3.2
Women's hosiery	-50.6	-2.0	40.2	-51.3	0.5
Socks	-50.5	-1.0	30.9	-29.0	-5.4
Apparel made from purchased materials	-53.8	-33.4	43.1	-38.8	-5.3
Upstream sectors[b]					
Cotton	-7.5	19.5	3.8	28.8	7.7
Cellulosic manmade fiber	-16.5	3.4	1.1	20.1	8.3
Synthetic fiber	-14.5	-2.0	3.1	17.3	8.2
Textile machines	-30.9	20.1	7.3	2.5	8.1
Downstream sectors[b]					
Public building furniture	25.0	66.0	46.7	46.7	8.5
Entire U.S. economy	6.9	28.7[d]	42.7	39.9	9.8

[a] The household price is the share-weighted average price of imported and domestic products purchased by households.

[b] These categories include all sectors with at least a 1 percent increase or decrease in output after liberalization (see table 9).

[c] There were no imports in these categories in 2005, so percentage changes cannot be calculated.

[d] Projected change in U.S. gross output is 28.7 percent; projected change in U.S. GDP is 21.7 percent.

Table 8 Effects of partial and full liberalizations on GDP and welfare, relative to projections, million dollars, 2011

Type of liberalization	Change in GDP	Change in welfare
Full	664.9	3,469.7
Partial		
All quantitative restraints	287.5	1,868.6
Chinese quantitative restraints only	88.2	895.5
All tariffs	766.2	829.6
All RoO effects	-452.6	818.3
Foreign demand reductions only	-166.4	-714.4

Note: The effects of the partial liberalizations may not sum to the full liberalization because of rounding and because of minor interaction effects absent from the partial liberalizations.

Table 9 Effects of textile and apparel liberalization, relative to projections, percent change, 2011

Sector	Employment	Output	Imports	Exports	Household price[a]
All textile and apparel	-10.2	-9.4	3.8	-51.3	-1.3
Textile mills	-18.3	-13.9	1.3	-57.0	-0.6
Broadwoven fabric mills	-28.9	-19.3	6.4	-73.4	-1.0
Narrow fabric mills	-40.5	-38.6	-1.9	-46.2	-1.3
Nonwoven fabric mills	1.2	0.2	0.4	0.6	0.0
Knit fabric mills	-30.4	-32.5	-10.3	-55.0	-0.8
Yarn mills and textile finishing n.e.c.	-21.5	-21.2	-7.0	-83.2	-1.3
Thread mills	-29.3	-27.0	-1.6	-87.3	-1.8
Carpets and rugs	-0.0	0.1	1.0	1.8	-0.1
Coated fabrics, not rubberized	-13.0	-11.7	1.3	-64.0	0.0
Tire cord	-0.9	-0.7	2.3	0.5	0.1
Cordage and twine	-0.3	-0.5	1.9	1.6	-0.2
Textile goods n.e.c.	1.3	-0.5	1.7	0.5	-0.1
Textile products	0.4	-1.0	3.3	-1.8	-1.3
Curtains and draperies	-4.9	-3.6	8.4	4.5	-2.5
House furnishings n.e.c.	8.2	-0.2	2.9	2.5	-2.0
Textile bags	-2.3	-2.2	6.0	3.7	-1.3
Canvas and related products	-2.4	-2.2	7.1	3.2	-1.6
Pleating and stitching	-12.2	-10.2	0.8	-89.2	-1.6
Auto appliqué and trim	-0.7	-0.6	—[c]	3.4	-0.3
Embroideries	-0.6	-0.6	—[c]	2.2	-0.1
Fabricated textile products n.e.c.	1.0	0.6	1.5	2.3	-1.1
Apparel	-7.8	-9.0	4.1	-62.9	-3.8
Women's hosiery	2.3	-3.0	8.7	-66.9	-0.3
Socks	-10.9	-11.4	12.8	-82.1	-7.1
Apparel made from purchased materials	-8.1	-9.8	4.0	-62.1	-4.1
Upstream sectors[b]					
Cotton	-10.0	-9.0	-29.7	2.9	0.1
Cellulosic manmade fiber	-6.6	-6.5	-5.2	0.2	-0.1
Synthetic fiber	-3.5	-6.1	-11.4	14.6	0.2
Textile machines	-3.4	-3.4	-5.7	1.0	0.2
Downstream sectors[b]					
Public building furniture	1.3	1.2	-0.1	7.0	0.2
Entire U.S. economy	0.00	-0.01[d]	0.14	0.08	0.09

[a] The household price is the share-weighted average price of imported and domestic products purchased by households.

[b] These categories include all sectors with at least a 1 percent increase or decrease in output.

[c] There were no imports in these categories in 2005, so percentage changes cannot be calculated.

[d] Projected change in U.S. gross output is -0.01 percent; projected change in U.S. GDP is 0.003 percent.

Table 10 Effects of partial and full liberalizations on *output*, relative to projections, percent change, 2011

Sector	QRs only	Tariffs only	RoO only	Full[a]
All textile and apparel	-0.2	-1.2	-8.0	-9.4
Textile mills	-0.1	-1.5	-12.2	-13.9
Broadwoven fabric mills	-0.1	-2.4	-16.8	-19.3
Narrow fabric mills	0.0	0.1	-38.6	-38.6
Nonwoven fabric mills	0.0	0.0	0.2	0.2
Knit fabric mills	-0.2	-1.6	-30.1	-32.5
Yarn mills and textile finishing n.e.c.	-0.4	-3.0	-17.8	-21.2
Thread mills	-0.1	-0.6	-26.1	-27.0
Carpets and rugs	0.0	-0.1	0.1	0.1
Coated fabrics, not rubberized	0.0	-0.5	-11.1	-11.7
Tire cord	0.0	-0.7	0.1	-0.7
Cordage and twine	0.0	-0.6	0.0	-0.5
Textile goods n.e.c.	0.0	-0.3	-0.2	-0.5
Textile products	0.0	-0.4	-0.5	-1.0
Curtains and draperies	0.0	-4.0	0.4	-3.6
House furnishings n.e.c.	0.0	-0.3	0.1	-0.2
Textile bags	0.0	-2.5	0.3	-2.2
Canvas and related products	0.0	-2.4	0.2	-2.2
Pleating and stitching	0.1	0.0	-10.1	-10.2
Auto appliqué and trim	0.0	0.3	-0.9	-0.6
Embroideries	0.0	0.5	-1.0	-0.6
Fabricated textile products n.e.c.	0.0	0.3	0.3	0.6
Apparel	-0.5	-1.4	-6.9	-9.0
Women's hosiery	-0.2	-0.2	-2.6	-3.0
Socks	-4.0	-1.5	-5.9	-11.4
Apparel made from purchased materials	-0.4	-1.6	-7.6	-9.8
Upstream sectors[b]				
Cotton	-0.1	-1.2	-7.7	-9.0
Cellulosic manmade fiber	-0.1	-1.1	-5.4	-6.5
Synthetic fiber	-0.1	-0.8	-5.1	-6.1
Textile machines	-0.2	-0.6	-2.7	-3.4
Downstream sectors[b]				
Public building furniture	0.0	0.7	0.5	1.2

[a] The effects of the partial liberalizations may not sum to the full liberalization because of rounding and because of minor interaction effects absent from the partial liberalizations.

[b] These categories include all sectors with at least a 1 percent increase or decrease in output in the full liberalization.

Table 11 Effects of partial and full liberalization on *exports*, relative to projections, percent change, 2011

Sector	QRs only	Tariffs only	RoO only	Full[a]
All textile and apparel	0.1	1.6	-52.0	-51.3
Textile mills	0.0	1.2	-57.4	-57.0
Broadwoven fabric mills	0.0	1.0	-73.7	-73.4
Narrow fabric mills	0.0	0.2	-46.3	-46.2
Nonwoven fabric mills	0.0	0.4	0.2	0.6
Knit fabric mills	0.0	3.1	-56.3	-55.0
Yarn mills and textile finishing n.e.c.	0.1	0.7	-83.3	-83.2
Thread mills	0.0	0.8	-87.4	-87.3
Carpets and rugs	0.0	0.6	1.2	1.8
Coated fabrics, not rubberized	0.0	1.0	-64.3	-64.0
Tire cord	0.0	0.3	0.3	0.5
Cordage and twine	0.0	1.0	0.6	1.6
Textile goods n.e.c.	0.0	0.3	0.3	0.5
Textile products	0.0	1.7	-3.4	-1.8
Curtains and draperies	0.0	2.6	1.9	4.5
House furnishings n.e.c.	0.0	2.1	0.5	2.5
Textile bags	0.0	2.4	1.3	3.7
Canvas and related products	0.0	2.1	1.1	3.2
Pleating and stitching	0.2	2.2	-89.4	-89.2
Auto appliqué and trim	0.2	2.3	1.0	3.4
Embroideries	0.0	1.4	0.8	2.2
Fabricated textile products n.e.c.	0.0	1.5	0.8	2.3
Apparel	0.4	4.5	-64.5	-62.9
Women's hosiery	-0.3	0.9	-67.0	-66.9
Socks	1.2	3.0	-82.7	-82.1
Apparel made from purchased materials	0.4	4.7	-63.8	-62.1
Upstream sectors[b]				
Cotton	0.0	0.4	2.5	2.9
Cellulosic manmade fiber	0.0	0.0	0.2	0.2
Synthetic fiber	-0.2	1.2	13.5	14.6
Textile machines	-0.1	-0.2	1.3	1.0
Downstream sectors[b]				
Public building furniture	-0.1	4.2	2.8	7.0

[a] The effects of the partial liberalizations may not sum to the full liberalization because of rounding and because of minor interaction effects absent from the partial liberalizations.

[b] These categories include all sectors with at least a 1 percent increase or decrease in output in the full liberalization.