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TIGHT CLOTHING:
HOW THE MFA AFFECTS ASIAN APPAREL EXPORTS

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ABSTRACT

International trade in apparel and textiles is regulated by a system of bilateral tariffs and quotas known as the Multifiber Arrangement or MFA. Using a time series of detailed product-level data from the United States on the quotas and tariffs that comprise the MFA, we analyze how the MFA affects the sources and prices of US apparel imports, with a particular focus on the effects on East Asian exporters during the 1990s. We show that while a large fraction of US apparel is imported under binding quotas, there are many quotas that remain unfilled. We also show that binding quotas substantially raise import prices, suggesting both quality upgrading and rent capture by exporters. In contrast, tariffs reduce import prices. Lastly, we argue that the substantial shift of US apparel imports away from Asia in favor of Mexico and the Caribbean during the 1990s is only partly due to discriminatory trade policy: the other reason is an increasing demand for timely delivery that gives a competitive advantage to nearby exporters.

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1. INTRODUCTION

Apparel is the archetypal labor-intensive footloose manufacturing industry. It is also very distorted by protection. This protection is unusually opaque, as world trade in textiles and apparel is heavily influenced by a complex system of bilateral quotas called the Multifiber Arrangement (MFA). Our goal in this paper is to improve our understanding of the extent and effects of the MFA, making use of a unique dataset on product-level US import quotas. We combine the quota data with very detailed data on trade flows, transport costs, and tariffs, and we focus on the East Asian exporters who have traditionally supplied the bulk of US apparel imports. Our findings include

- The MFA constrains exporters in East Asia, although many exports are not subject to binding quotas, especially those from China and Hong Kong.
- Trade liberalization during the 1990s helped East Asian exporters to expand their sales to the US, but hurt them relative to their competitors in Mexico and Asia.
- Technological change which led to an increased demand for timely delivery also hurt East Asia relative to Mexico and the Caribbean.

- The MFA raised import prices and transferred many billions of dollars in quota rents to holders of quota licenses in East Asia and elsewhere.

2. U.S. TRADE POLICY IN APPAREL

A variety of restrictions have long affected trade in textile and apparel products. As early as the 1950s, the United States adopted policies intended to limit the imports of such products. One of the broadest policies, however, became effective in 1974. The MFA established a system of quotas, negotiated bilaterally, that limited imports of textile and apparel products.

Recently, efforts have been made to liberalize trade in apparel. Participants in the Uruguay Round of trade talks under the WTO agreed to phase out the MFA beginning in 1995. The MFA was replaced by the Agreement on Textiles and Clothing (ATC) which put in place a system for gradual elimination of quantitative restrictions. The ATC incorporated a series of stages, with phase-outs occurring at the beginning of 1995, 1998, 2002, and 2005, at which time all remaining quotas will be eliminated. Remaining quotas are progressively enlarged, using agreed-to increasing growth rates. The agreement also established a special safeguard mechanism for protection against surges and a monitoring body to supervise implementation. The United States has participated in the MFA phase-out

process. Note, however, that when the first stage of quota elimination began in 1995, the United States was one of only four WTO members that still maintained import restrictions under the MFA.[1]

In addition to agreeing to eliminate quantitative restrictions, the United States agreed to reduce its tariffs on textile and apparel products. According to the Office of Textiles and Apparel (OTEXA, a division of the U.S. Commerce Department that administers the US's MFA quotas) tariffs on textile and apparel products were slated to decline from a trade weighted average of 17.2 percent ad valorem in 1994 to a trade weighted average of 15.2 percent ad valorem in 2004. The majority of these reductions will be phased in over the 10 years.[2]

Regional liberalization efforts have also affected the degree to which quantitative restrictions constrain trade. The main regional agreements affecting the period which we examine are the Caribbean Basin Initiative/ Caribbean Basin Economic Recovery Act (CBI/CBERA) and the North American Free Trade Agreement (NAFTA).[3] The CBI/CBERA programs,

[1] According to the WTO, the other countries were Canada, the EC, and Norway. Many other WTO Members maintained the right to use the transitional safeguard mechanism in the ATC. Only nine members were deemed to have integrated 100 percent at the outset. (WTO 2003)

[2] See OTEXA 1995.

[3] The Andean Trade Preference Act (ATPA) was another program that provided benefits that, in some cases, applied to trade in apparel. The (ATPA) was signed into law on December 4, 1991, but excluded many apparel products. More specifically, ineligible

initially enacted in the mid-1980s, provided preferential treatment for imports from twenty-four countries in that region.[4] While apparel products are generally not eligible for CBI/CBERA benefits, apparel assembled in the Caribbean Basin using U.S.-origin components receives preferential treatment in the form of easing of quotas and/or reduced duties. While these trade preferences clearly affected imports from this region, there were no major changes to the policy over the time period that we examine.

Prior to the enactment of NAFTA in 1994, Mexico did not receive trade preferences on apparel exports commensurate with those available to the CBI countries.[5] The enactment of NAFTA, however, significantly changed the relative position of CBI countries vis à vis Mexico. Many apparel articles not eligible for benefits under CBI/CBERA were scheduled for a gradual reduction in duties under NAFTA. Further, provisions for production-sharing arrangements with Mexico became more advantageous than those for production-sharing with CBI countries. (This change in the

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products included, "textile and apparel items subject to textile agreements on the date that the ATPA took effect." In 1996, of total apparel (SIC 238) imports from ATPA countries, $1.2 million of $6.8 million entered duty-free, and in 1997 $1.2 million out of $15 million entered duty-free. In 1995, ATPA countries also became eligible for 9802 benefits. Assembled apparel items ($185 million with 47 percent U.S.-content value) accounted for almost 95 percent of the value of U.S. imports from ATPA beneficiaries under HTS item 9802.00.80 in 2001; the other industrial group with appreciable amounts was textile mill products ($10 million with 54 percent U.S.-content value). See Shelburne (2002).

[4] Note that benefits were subject to the countries satisfying certain conditions.

relative position of Mexico versus the CBI countries can be seen in the change in tariff incidence by region between 1990 and 1998, as shown in Figures 5 and 6.)

The differential effect of these preferential agreements on Mexico/CBI versus Asia should be kept in mind. However, there were generally no significant changes in the treatment of CBI countries over this time, so that NAFTA is the more important element to consider. Further, in the section in which we discuss changes in patterns of imports from Asia versus Mexico/CBI, the tariff and quota data should capture the effects of the preferential agreements.

3. THE EXTENT OF PROTECTION IN APPAREL

Given this elaborate structure of trade restrictions, it is not surprising that textiles and apparel have often been characterized as the "bad boy" of broader efforts to liberalize trade flows. For example, Michael Finger and Ann Harrison (1996) write, "Although textiles and apparel account for less than 2 percent of total employment in the U.S. economy, protecting them against import competition accounts for 83 percent of the net cost to the U.S. economy of all import restrictions."

[5] Pregelj (2000).

U.S. imports of apparel encounter both tariff and quota protection at the border. Data on tariff rates is fairly readily available. We utilize trade data on apparel imports, tariffs, and transport costs from CD-ROMS purchased from the US Commerce Department. These data are reported at the 10-digit HS level, which is the finest level of disaggregation available. Among other things, the data include information on import values, import quantities, tariffs, transport costs, and source country.

The data suggest a high level of protection in this sector, at least at the beginning of the 1990s. Figure 1 shows histograms, weighted by import values, of tariff rates across all sources of apparel imports. In 1990 and 1991, about half of US imports paid tariffs of over 16 percent, and virtually none came in duty-free. There has been some liberalization since the early 1990s. However, by 1998, high tariffs were much less prevalent, and about 20 percent entered nearly duty free (with tariffs of less than 2 percent).

Information on quota incidence is more difficult to obtain than data on tariffs. As a result, analysis evaluating the extent to which the quota system has restricted imports to the United States has been somewhat limited. Information on US textile and apparel quotas is maintained by the Office of Textiles and Apparel (OTEXA) within the Commerce Department. Working with OTEXA, we have assembled a comprehensive product-level

time series on the U.S. MFA program. Quota levels vary by product, year, and trading partner. We obtained records on all apparel quotas from 1990 to 1998. OTEXA uses their own import classification system to administer the MFA, which has no simple relationship to any other US or international system of reporting trade data. The product categories are broken down by type of fiber (cotton, wool, silk, man-made, and other), and are fairly broad: categories include "dresses," "sweaters," "underwear," etc.. Using this data, we are able to examine the extent to which quotas have restricted imports of apparel and textile.

The most important indicator of a quota's restrictiveness is its "fill rate," defined as the percentage of a quota that is used. Fill rates that are much less than 100 percent suggest that the quota is not binding, while higher fill rates indicate that the quota indeed keeps imports below what they would otherwise be. Appendix Table 1 summarizes quota incidence in 1991 and 1998 by commodity.

Figure 2 illustrates the incidence of quotas. It shows histograms of quota fill rates across all sources of apparel imports, weighted by import values, for each of the years in the sample. If we define a binding quota as one with a fill rate of 90 percent or above, the figure shows that about 40 percent of US apparel imports came in under binding quotas throughout the

1990s.[6] One question of interest is whether the gradual liberalization under the WTO has affected the incidence of quotas. Many of the required changes in quota restrictions have been delayed until the very last phase-out period. In the case of the United States, nearly 50 percent of the planned phase-outs will not occur until the final tranche on January 1, 2005. [7] In fact, according to the 1998 review of the implementation of the agreement, a number of countries complained that a vast majority of liberalization in terms of the value of trade would indeed not occur until the final phases of the program. [8] This slow progress on liberalization is reflected in the fact that there has been little change in the proportion of trade coming in under binding quotas during this period. Nevertheless, the fact that much of the trade is not affected by a binding quota suggests that even the current restrictions are not as onerous as might have been expected.

Figures 1 and 2 cover all sources of US apparel imports, and are not necessarily indicative of the barriers facing East Asian exporters. Figure 3 shows the value of apparel imports from East Asia. China and Hong Kong

[6] Industry experts define a quota as restrictive or "constraining" if it is filled to between 85 and 90 percent. Although this level is still below the maximum allowed export limit, complexities in the quota management system (including complex aggregates) can make it difficult to completely fill a quota (USITC 2002). The EU defines quotas 95 percent filled as constraining. See USITC (2002).
[7] See OTEXA *Integration*. This is consistent with the liberalization requirements of the ATC.
[8] See WTO (1998).

are the largest exporters of both constrained and unconstrained imports, while the smaller exporters (Thailand, Singapore, Indonesia, and the Philippines) seem to have their exports very tightly capped by MFA quotas.

Table 1 shows the extent to which quotas have applied to U.S. imports, and it confirms the visual impression of Figure 2: the share of US imports coming in under a binding quota did not change much during the 1990s. It is important to remember that the 1990s were a time of booming demand in the US, so it may be that expanding quota limits simply kept pace with growing demand, leaving the equilibrium amount of quota-constrained trade roughly equal. Indeed, the import-weighted average binding quota grew by 10 percent per year over the period. Table 2 illustrates that there was substantial liberalization for the major East Asian exporters, with China and Hong Kong seeing their quota-constrained exports fall by more than 15 percentage points as a share of their total exports, while Taiwan's quota-constrained share fell by 25 percentage points. By contrast, Thailand, Indonesia, the Philippines, and Korea all found themselves more tightly constrained in 1998 than they were in 1991.

Figures 2 and 3 and Tables 1 and 2 establish that aggregate US quota coverage didn't change much, while the big East Asian exporters saw some liberalization. How is this possible? The answer is Mexico and the

Caribbean. Figure 4 shows that the 1990s saw a substantial shift in apparel import market share away from Asia and toward Mexico and the Caribbean. This was at least partly due to tariff liberalization that favors these countries close to the United States, as seen in Figures 5 and 6. However, as tariffs were liberalized for Mexico and the Caribbean, Mexico became more constrained by quotas, as illustrated in Figures 7 and 8.

3. TRADE AND THE DEMAND FOR TIMELINESS

Trade policy in the form of NAFTA and the Caribbean Basin Initiative (CBI) is certainly part of the reason for the market share shifts seen in Figure 4. Another explanation, discussed in detail in Evans and Harrigan (2003), is that an increased demand for timeliness (by which we mean a short and reliable lag between order and delivery) has affected the pattern of trade. In apparel retailing, the demand for timely delivery comes from fluctuations in demand, and varies by product category. To measure the demand for timeliness, we collected data from a major US department store chain on the percentage of various apparel categories that are subject to "rapid replenishment," that is, which are re-ordered continuously throughout the selling season. This business strategy was almost unknown in 1990 but

was in widespread use by the end of the decade.[9] Since rapid delivery is most profitable from nearby locations, our hypothesis is that imports of products where rapid replenishment is important have grown disproportionately from countries near the US.

A possible substitute for proximity is airfreight: imports that are shipped by air from distant countries can arrive just as quickly as products shipped by sea or land from nearby countries. Air freight has gotten much cheaper over time (see Hummels, 2001), but it remains far more expensive than other modes, suggesting that only products that have a high ratio of value to weight ("light" products) can profitably be shipped by air. If airfreight is a substitute for proximity, and if airfreight is only profitable for light products, then we should see that light products have increasingly been sourced from countries far from the US.

To investigate these hypothesis, we estimated the following equation on a single long time difference from 1991 to 1998:

$$\Delta m_{ic} = \mu_i + \mu_c + \alpha \Delta \tau_{ic} + \beta_1 r_i d_c + \beta_2 v_{ic} d_c \qquad (1)$$

where the μ's are product and country fixed effects and

Δm_{ic} = growth in imports in product i from country c

$\Delta \tau_{ic}$ = change in ad-valorem trade barriers

[9] See Abernathy et al (1999).

r_i = percent of products in category i subject to rapid replenishment

d_c = indicator equal to 1 for countries close to the US (Mexico, Caribbean, Canada)

v_{ic} = value-to-weight ratio of product *i* from country *c* in last year of sample. Larger values of v_{ic} correspond to lighter products.

The hypotheses are that $\beta_1 > 0$ and $\beta_2 < 0$: products where replenishment is important, and products that are heavy, grew more rapidly from nearby countries. We test this hypothesis using only observations where quotas were not binding, and the results are given in Table 3 (which is closely related to results in Harrigan and Evans (2003); see that paper for more details, data description, and sensitivity analysis). The proximity-replenishment effect β_1 is about one, with a *t*-statistic of 3. How big is this effect? Since the range of the replenishment variable is between 0 and 67 percent, an estimated β of 1.04 implies that high-replenishment products from nearby countries grew 1.04×67 = 70 percentage points faster than otherwise. This is a big effect: it is more than 2.5 times faster than the mean level of bounded growth, and almost half again as fast as median growth. For products where replenishment is less important, with a replenishment percentage of 25 percent, the estimates still imply a big proximity effect,

with imports growing 26 percentage points faster from nearby countries than more remote sources. The replenishment-proximity effect is also large relative to the effects of protection: the estimated parameters imply that, for high-replenishment products, proximity to the US is equivalent to a 53 percentage point reduction in tariffs, while for goods with a replenishment percentage of 25 percent proximity is equivalent to a 20 percentage point tariff reduction.

The effect of weight is also large. The standard deviation of the value-weight ratio is 230; multiplying this by the estimated β_2 means that imports of light products grew -0.132*230 = 30 percentage points more slowly from nearby than from faraway countries.

4. THE EFFECT OF PROTECTION ON IMPORT PRICES

We have shown that both trade policy and geography have had an important effect on the pattern and volume of trade in apparel. We now turn to the effect of US trade policy on the prices of apparel imports. With two or more competing exporters, a key parameter is the degree of substitutability in the importer's demand between the products of the different exporters. We consider a few simple cases here, as a guide to empirical work.

The simplest model that is relevant to the MFA is one where there are two exporters, only one of whom faces a binding quota, and whose exports are perfect substitutes in the importer's demand. The situation is illustrated in Figure 9.

The import demand curve facing two exporting countries A and B is given by $m(p)$. A has lower costs $c_A < c_B$, so that in the absence of trade restrictions all imports would be from A. However, a quota has been placed on imports from A, $m_A \leq Q$. As a result, the world price is determined by cost in B, $p = c_B$, with exporters in A earning a rent per unit equal to the cost difference.[10] The quota binds, with $m_A = Q$ and $m_B = m(c_B) - Q$.

An interesting thing about this little model is that it implies that, across a group of exporting countries, there need be no relationship between unit value and a binding quota: the two countries charge the same price even though one is bound by a quota and the other is not. Furthermore, any change in the level of the quota will have no effect on price, as long as $Q \leq m(c_B)$; beyond that point, B's market share goes to zero and any further quota relaxation leads to a fall in price as the equilibrium moves down the demand curve.

[10] Technical point: the importer is indifferent between buying from A or B at any price, so assume an infinitesimally lower price from A to close the model.

What if imports from *A* and *B* are imperfect substitutes? This case is illustrated in the two panels of Figure 10. A relaxation of the quota constraint on *A* leads to lower prices on imports from *A*, which in turn shifts the demand curve facing exporters in *B*. Depending on the elasticities of demand in the two markets, and the elasticity of supply in *B*, relative prices of *A* and *B* exports can rise, fall, or stay the same. A useful benchmark is one where the own-elasticity of demand is the same, while the cross elasticity is less than the own-elasticity: in this case, the shift down in *B*'s demand curve is less than the fall in the price facing *A*. This implies that the equilibrium price of imports from *A* will fall relative to the price of imports from *B* when the quota on *A* is relaxed. In the cross-section, then, binding quotas will be associated with higher prices. Note however, that the equilibrium price difference across exporters depends on many structural parameters of demand and supply that are impossible to estimate without a great deal of information.

What about non-binding quotas? In most models unfilled quotas will have no effect, and the equilibrium is the same as one with no quotas at all.

This theoretical discussion suggests a simple reduced-form model for the effect of quotas on import prices:

$$\ln p_{ict} = \alpha_i + \alpha_c + \alpha_t + \beta_1 \ln(1+\tau_{ict}) + \beta_2 \ln(1+fillrate_{ict}) + \beta_3 binding_{ict} + \varepsilon_{ict} \quad (2)$$

In equation (2), the α's are product, country, and year fixed effects. The slope coefficients β measure the effects of

τ_{ict} ad-valorem trade barriers, including tariffs and transport costs

$fillrate_{ict}$ the proportion of a quota which is used. By definition, the fill rate for flows not subject to a quota is zero (since the implicit quota is infinite).

$binding_{ict}$ A dummy variable equal to 1 if the quota is binding.

A drawback of (2) is that it imposes constant coefficients across products and years. Our data has enough cross-sectional variability to make year-by-year estimation feasible, so we also estimate

$$\ln p_{ict} = \alpha_{it} + \alpha_{ct} + \beta_{1t} \ln(1+\tau_{ict}) + \beta_{2t} \ln(1+fillrate_{ict}) + \beta_{3t} binding_{ict} + \varepsilon_{ict} \quad (3)$$

While equations (2) and (3) are non-structural, theory does give some suggestions about the interpretation of the slope coefficients. β_1 summarizes how f.o.b. import prices respond to ad-valorem trade barriers, and is expected to be negative to the extent that the US has market power. If non-binding quotas don't have any effect, β_2 is likely to be zero, given that the effect of binding quotas is measured by β_3.

A problem with estimating (2) and (3) is that we do not have true price data and must make do with unit values instead. Unit values are constructed from the raw data by dividing the value of shipments by the physical quantity of imports (usually measured by "dozens" in the case of apparel). Unit values in a given category can differ across exporters even if identical goods have identical prices everywhere, to the extent that the composition of exports within a category differs by source country. The theory of "quality upgrading" suggests that binding quotas induce higher unit values, in which case $\beta_3 > 0$ may measure quality differences rather than quota rents.[11]

Table 4 shows the results of estimating equations (2) and (3). We report both OLS and weighted least squares estimates, with the weights given by import values. We focus here on the WLS results.

The column headed "barriers" suggests that the US does indeed have market power in apparel, with a significantly negative elasticity of import prices with respect to ad-valorem barriers in most years. Interestingly, the effect seems to have declined over time, with an elasticity of -0.5 at the beginning of the sample and only -0.06 by 1998.

[11] See Feenstra 2004, Chapter 8.

Binding quotas had a sizable impact on prices, with an overall effect of 6.3 percentage points. Between 1990 and 1996, the quota effect was on the order of 5-10 percentage points, an effect which jumped to 24 in the "Asia Crisis" year of 1997 before becoming slightly negative in the recovery year of 1998. This anomalous behavior may be due to the fact that two of the largest quota-constrained exporters, China and Hong Kong, did not devalue in 1997, while other countries did.

Controlling for whether or not a quota is binding, the fill rate has no effect, as shown in the first row of Table 4. For clarity in reporting, we excluded the fill rate as a regressor in the year-by-year regressions.[12]

Our results suggest that effect of quotas on prices is a step function: for fill rates between zero and 90 percent the effect is zero, and for fill rates above 90 the effect is constant. This is the right specification only if quotas bind precisely when fill rates hit 90 percent but not before or after. To check this we estimated versions of equation (2) that included dummies for fill rates in the intervals [80,85), [85,90), [90,95), and [95,100]. The results suggests that quotas start to bind at fill rates of around 85 percent, and that

[12] This result is not surprising, but it does cast doubt on the results of Krishna and Tan (1998). They find a positive effect of fill rate on import prices, but fail to control for whether the quota is binding.

the price effect is constant between 85 percent and 100 percent.[13] However, the results from assuming that quotas bind at a fill rate of 85% are not materially different from the results reported in Table 4.

What do these results imply about the level of quota rents? It is impossible to answer this question with any confidence, since our statistical model is non-structural, but a back of the envelope calculation is instructive. Using the overall WLS binding quota effect of 6.3 percent, and multiplying by the aggregate quantity of quota-constrained imports between 1990 and 1998 ($106.5 billion), gives an estimate of quota rents of $6.71 billion. This is almost surely a lower bound on the cost of the MFA for US apparel consumers, since the elimination of quotas would likely reduce world prices.

5. CONCLUSIONS

The 1990s had both good and bad news for East Asian apparel exporters. Their overall exports to the US increased, at least partly due to trade liberalization in the form of reduced tariffs and expanded quotas. But both discriminatory trade policy (NAFTA and the CBI) and technological change (which made proximity to the US market more valuable) conspired

[13] In particular, the coefficient on the indicator for the [80,85) interval is insignificantly different from zero, while the other intervals are all significantly positive. In addition, an

against East Asia, leading to a loss of market share to Mexico and the Caribbean. As trade continues to liberalize, trade policy may cease to be an advantage for exporters near the US market, but their geographical advantage will persist. This suggests that even when the MFA is finally phased out, trade patterns are unlikely to return to where they were before NAFTA and the CBI.

The MFA continued to substantially distort trade even after the founding of the WTO. We find that MFA quotas tightly constrained many East Asian exporters, and led to substantially higher import prices in the US. A rough calculation suggests that MFA quotas yielded many billions of dollars in quota rents to holders of quota licenses.

F-test fails to reject the hypothesis that the coefficients on the [85,90), [90,95), and [95,100] intervals are equal.

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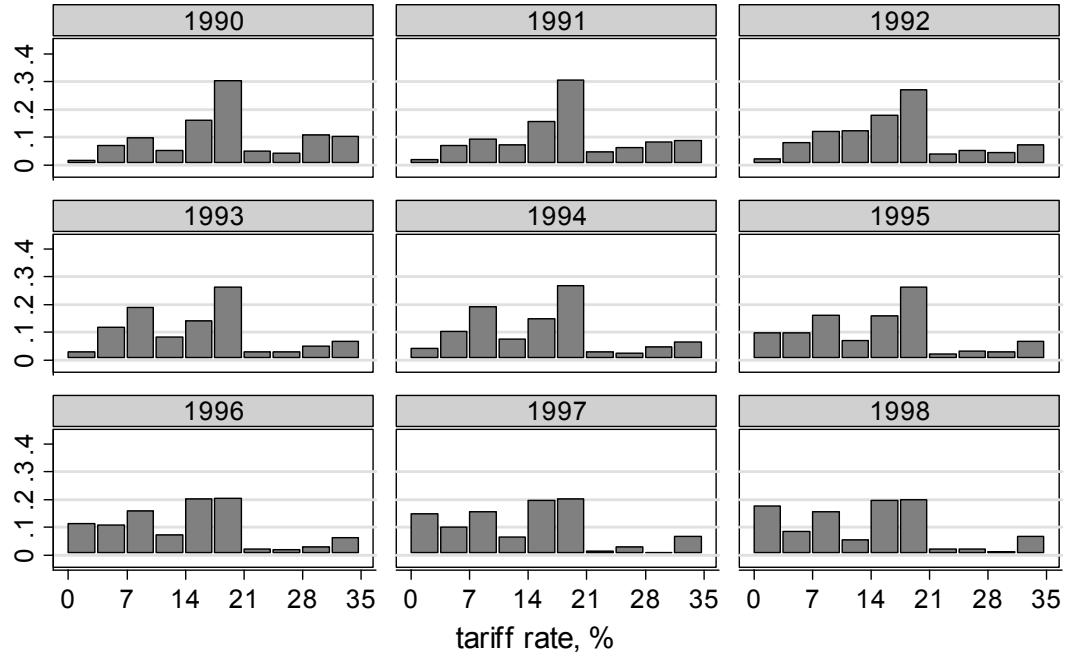
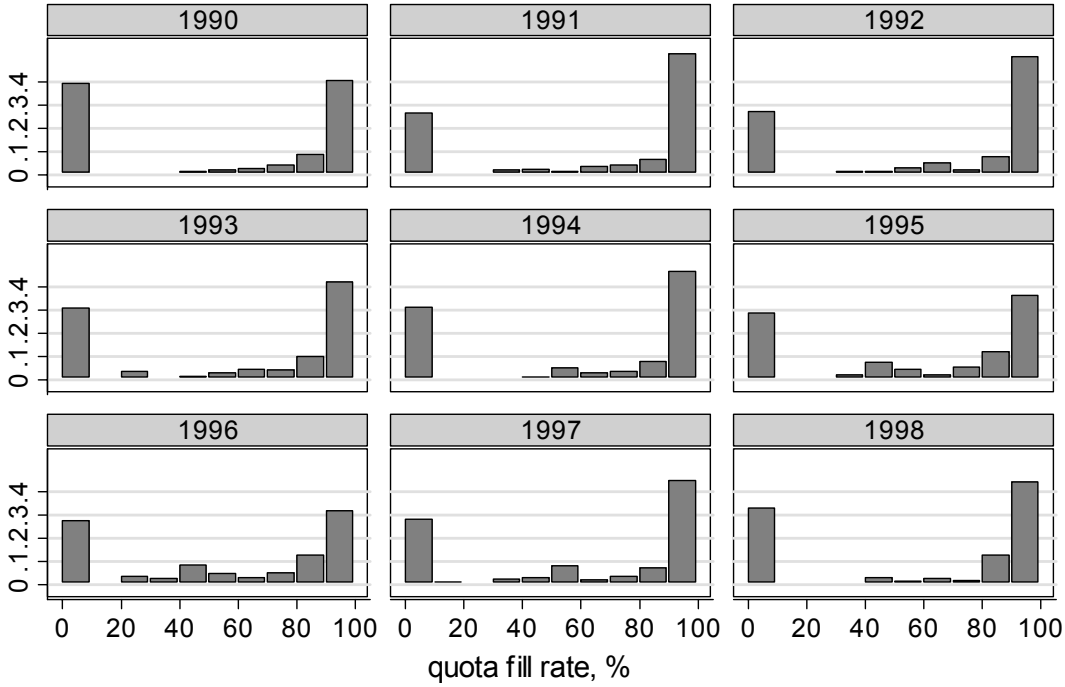
Figure 1- Distribution of tariff rates, 1990-98



Histogram weighted by import values
Includes values <=35%, or 98.5% of data

Figure 2- Distribution of quota fill rates, 1990-98



Histogram weighted by import values

Figure 3- US apparel imports from East Asia, 1990-98

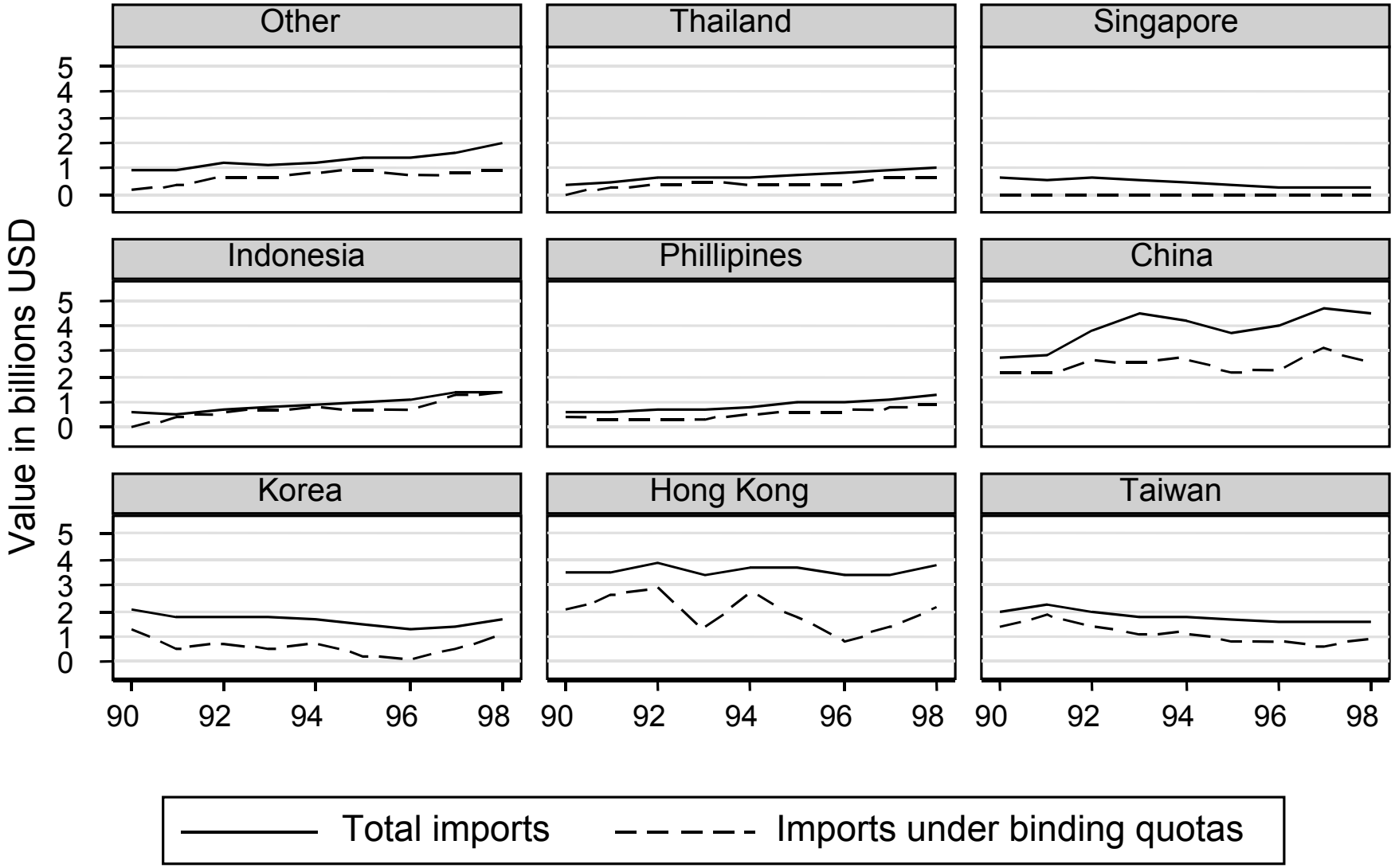


Table 1 - US apparel imports from all sources

	Unrestricted	Non-binding quota	Binding quota
1990	39	20	41
1991	27	21	52
1992	27	22	51
1993	30	27	42
1994	30	23	47
1995	27	37	36
1996	27	41	32
1997	28	27	45
1998	33	23	44

Notes to Table 1: Unrestricted imports face no quota. A non-binding quota is defined as having a fill rate between 0 and 90, and binding quotas have fill rates of at least 90 percent.

Table 2 - Quota incidence in East Asia

	Percent of imports under binding quota	
	1991	**1998**
Other	33	48
Thailand	53	59
Singapore	0	0
Indonesia	81	99
Philippines	58	70
China	74	57
Korea	28	65
Hong Kong	73	57
Taiwan	83	58

Figure 4- Share of US Apparel Imports, 1990-1998

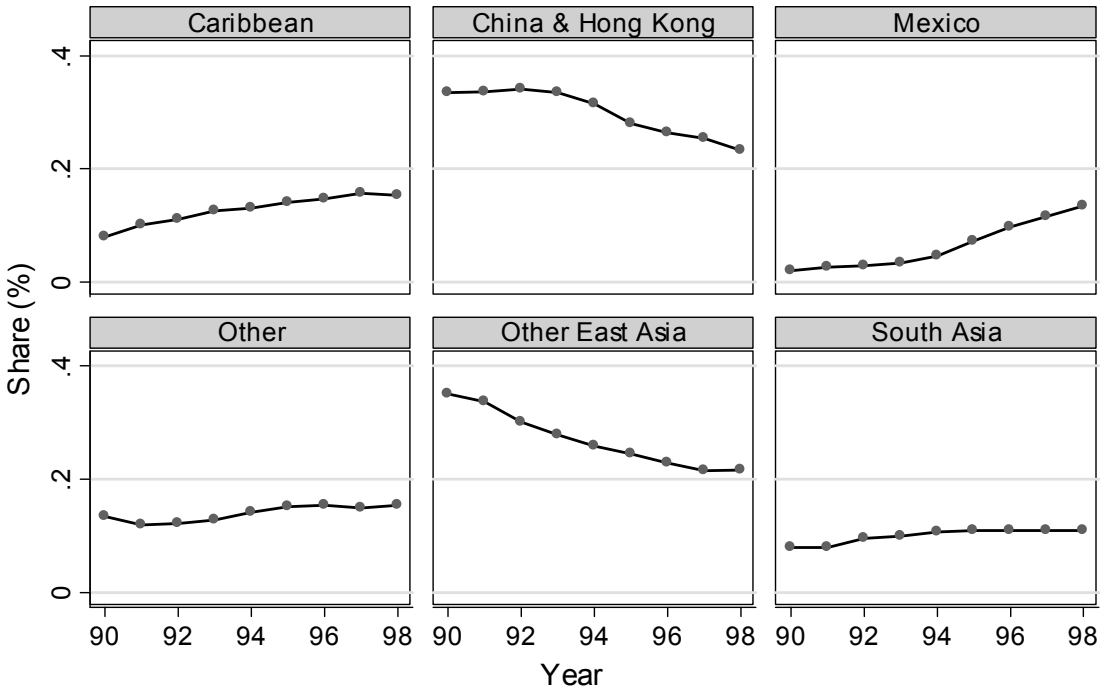
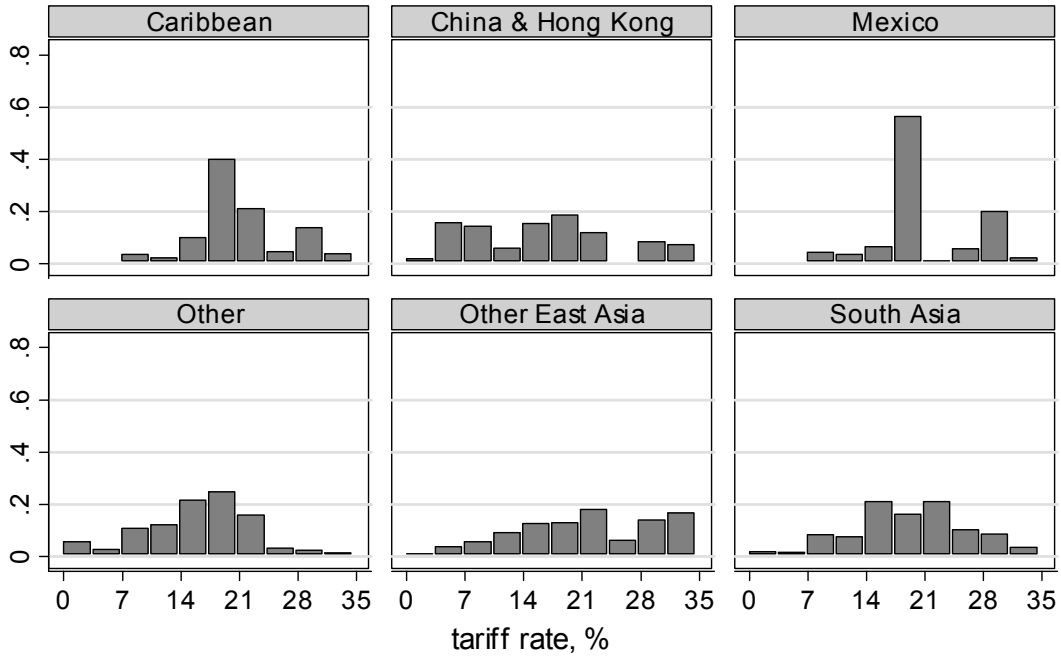
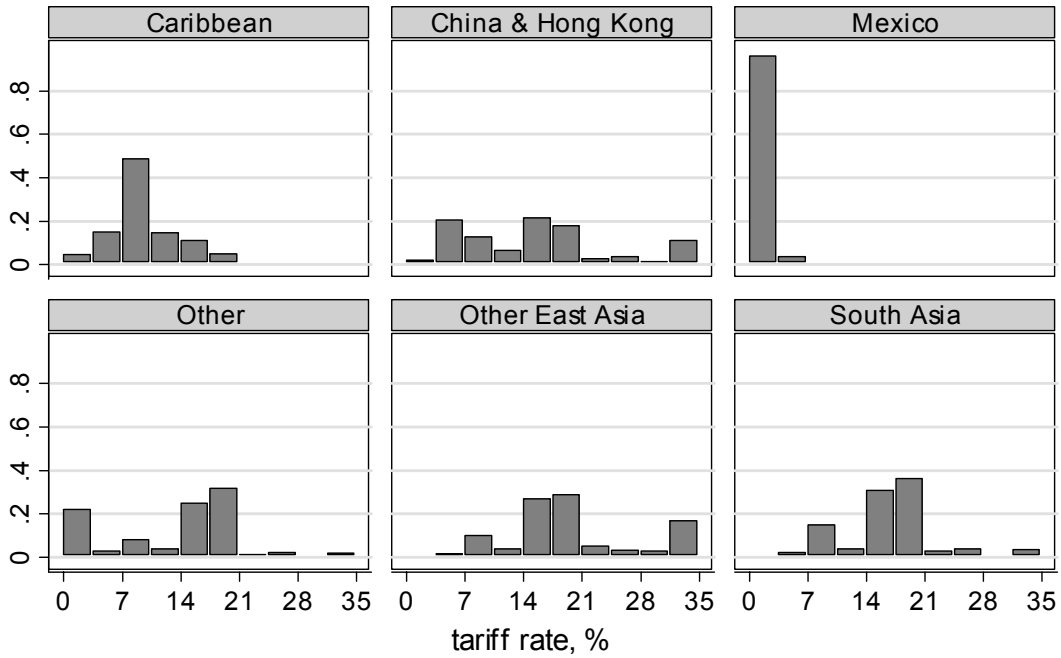


Figure 5- Tariff incidence by region, 1991



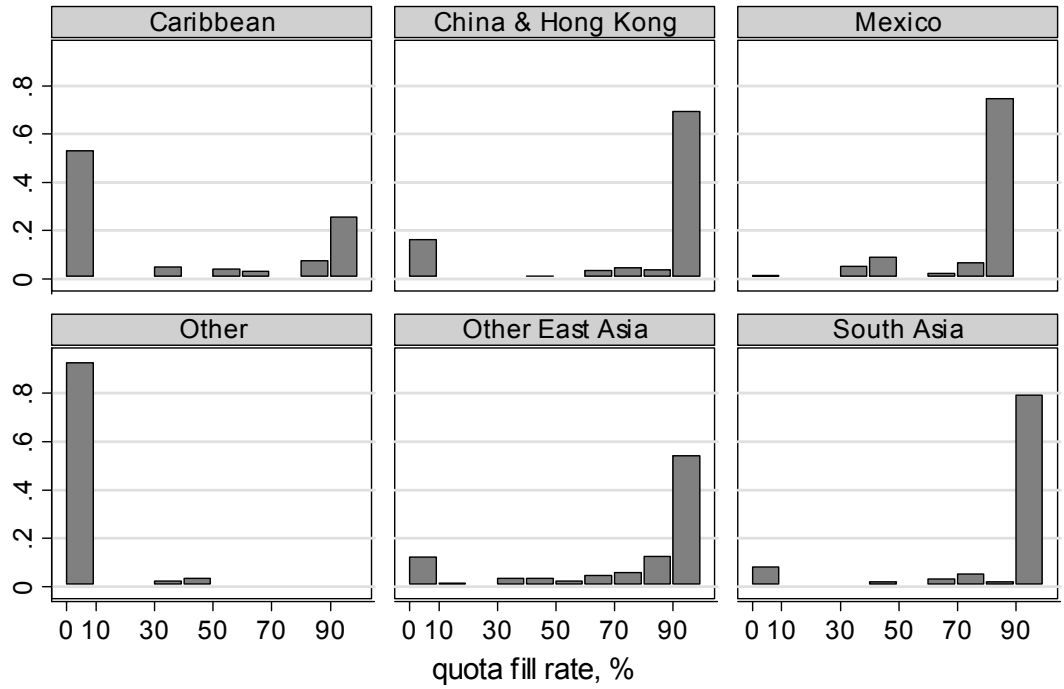
Histogram weighted by import values
Includes values <=35%, 98.5% of data

Figure 6- Tariff incidence by region, 1998



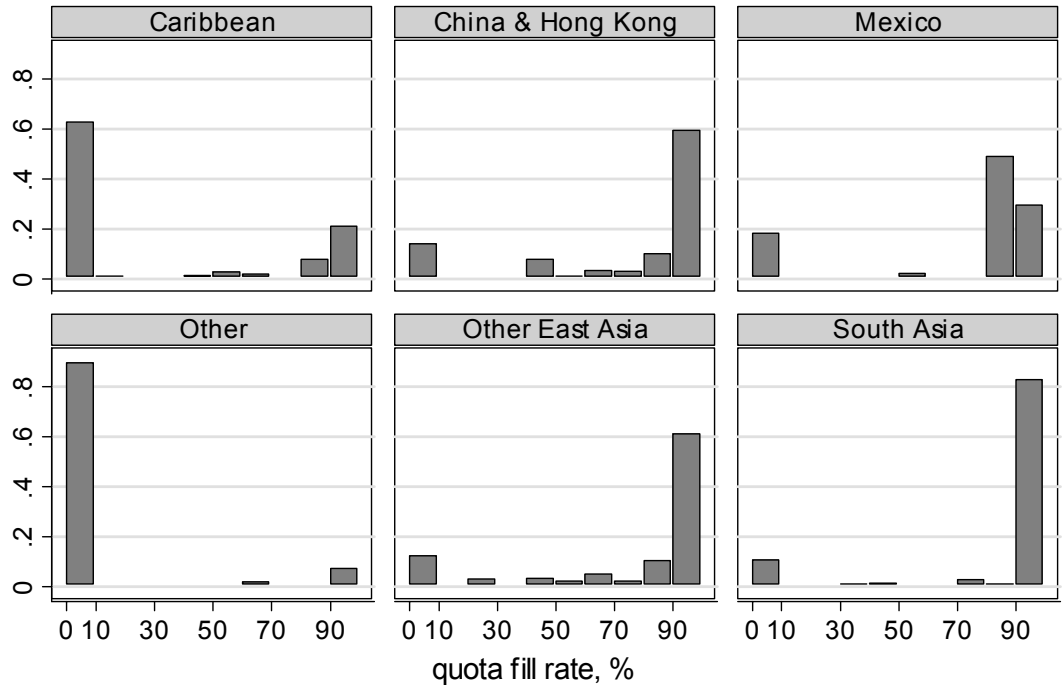
Histogram weighted by import values
Includes values <=35%, 98.5% of data

Figure 7- Quota incidence by region, 1991



Histogram weighted by import values

Figure 8- Quota incidence by region, 1998



Histogram weighted by import values

Table 3 - Import growth 1991-1998

variable	estimate
proximity×replenishment	0.9968
	3.00
proximity×(value/weight)	-0.132
	-2.42
trade barriers	-1.259
	-7.60

Notes to Table 3: all regressions include country and product fixed effects. Sample is observations not constrained by quotas (N = 2,753). *t*-statistics in italics. Dependent variable is bounded import growth between 1991 and 1998:

$$G_{ic} = 200 \cdot \frac{m_{ict} - m_{ic,t-1}}{\left(m_{ict} + m_{ic,t-1}\right)}$$

Figure 9 - Effects of a quota when imports are perfect substitutes

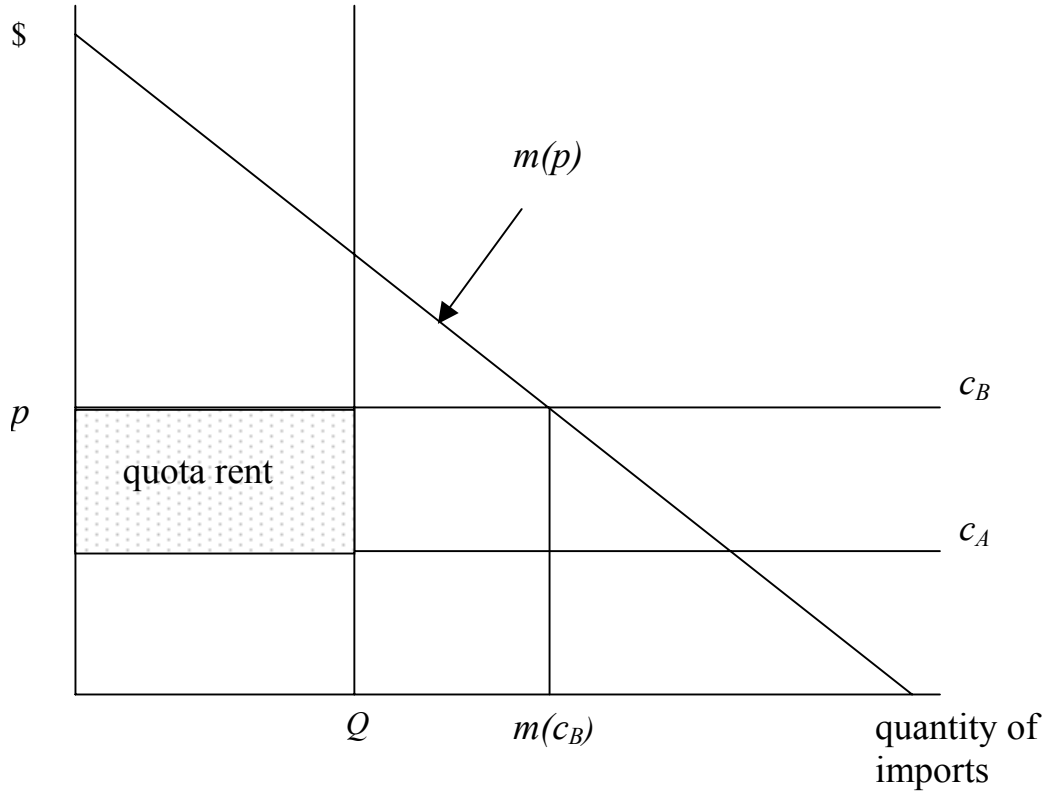
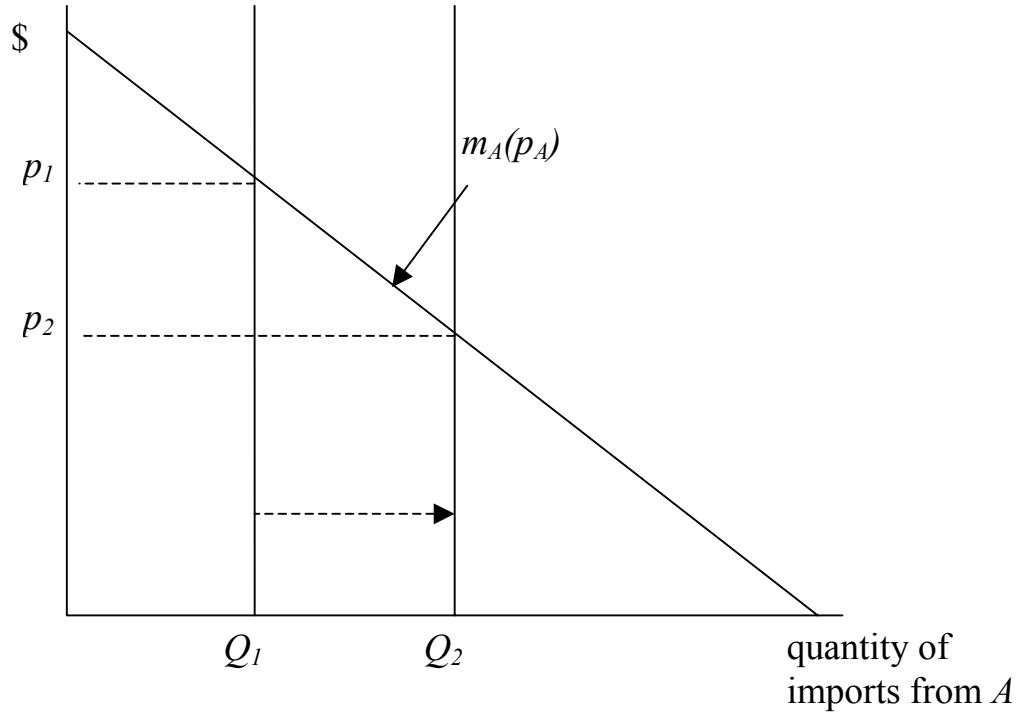


Figure 10 - Effects of a quota when imports are imperfect substitutes



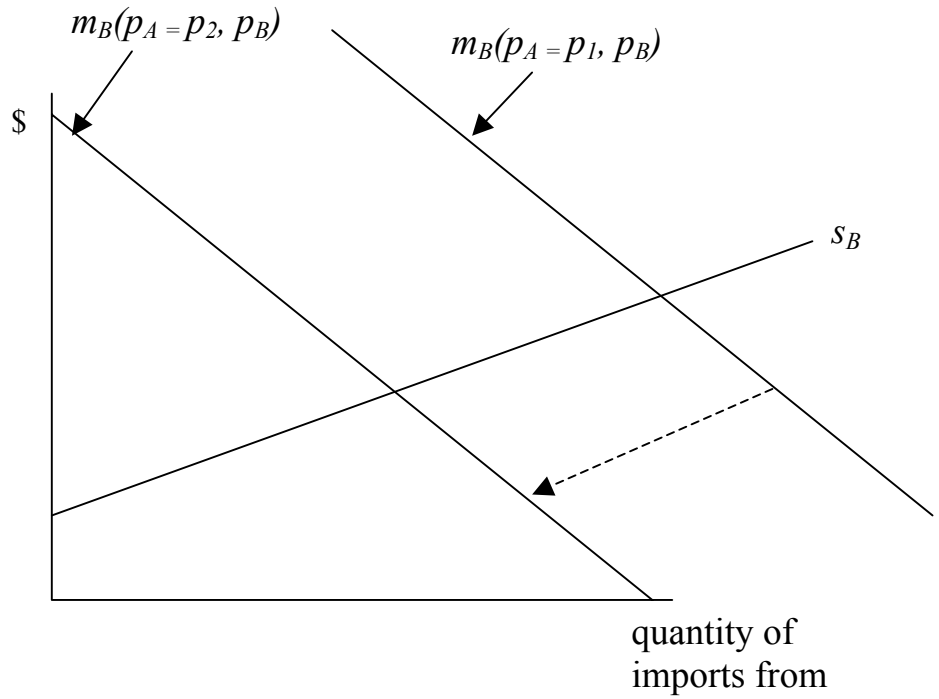


Table 4 - Price effects

	OLS			Weighted LS		
	barriers	Quota	fill rate	barriers	quota	fill rate
1990-98	-0.241	0.102	0.000	-0.016	0.063	-0.003
	-29.0	*5.1*	*0.0*	*-2.7*	*14.2*	*-1.9*
1990	-0.395	0.205		-0.504	0.108	
	-11.2	*3.1*		*-8.5*	*7.5*	
1991	-0.302	0.104		-0.212	0.053	
	-10.4	*2.0*		*-3.9*	*4.0*	
1992	-0.235	0.097		-0.390	0.054	
	-8.1	*1.8*		*-9.2*	*4.2*	
1993	-0.211	0.133		-0.343	0.065	
	-9.1	*2.4*		*-11.9*	*5.0*	
1994	-0.266	0.159		-0.179	0.096	
	-10.4	*3.0*		*-7.8*	*6.6*	
1995	-0.303	0.057		-0.182	0.076	
	-11.2	*1.1*		*-7.9*	*5.5*	
1996	-0.257	0.080		-0.062	0.088	
	-9.1	*1.5*		*-2.9*	*6.2*	
1997	-0.264	0.115		0.010	0.242	
	-9.6	*2.2*		*0.5*	*18.5*	
1998	-0.264	0.129		-0.060	-0.034	
	-10.6	*2.6*		*-2.8*	*-2.5*	

Notes to Table 4: Dependent variable is log unit value of imports into United States, by exporter, product, and year. See text for definitions of regressors. All regressions include exporter and product fixed effects, and first row regressions include year fixed effects. For weighted least squares, the weights are import values. *t*-statistics in italics.

Appendix Table 1 - Binding quota incidence and market share by commodity

Description *	Commodity No.	Percent binding, 1991	Percent binding, 1998	Market share, 1998
M&B Knit Shirts, Cotton	338	66	58	10.7
M&B Cot. Trousers/Breeches/Shorts	347	56	35	10.4
W&G Cotton Trousers/Slacks/Shorts	348	63	30	8.4
W&G Knit Shirts/Blouses, Cotton	339	48	60	7.4
M&B Cotton Shirts, Not Knit	340	71	54	6.4
W&G Mmf Knit Shirts & Blouses	639	64	86	4.9
Other M&B Mmf Coats	634	79	43	3.5
W&G Mmf Coats	635	54	28	3.2
M&B Mmf Trousers/Breeches/Shorts	647	69	64	3.1
M&B Mmf Knit Shirts	638	55	70	3
W&G Cot. Shirts/Blouses,N-Knit	341	47	71	2.6
Mmf Dresses	636	59	32	2.6
W&G Mmf Slacks/Breeches/Shorts	648	66	62	2.3
Other Mmf Apparel	659	38	22	2.3
Other Cotton Apparel	359	46	17	1.8
W&G Not-Knit Mmf Shirts & Blouses	641	60	43	1.8
W&G Sweaters, Wool	446	64	56	1.6
W&G Mmf Sweaters	646	6	47	1.6
W&G Wool Coats	435	29	11	1.5
Mmf Skirts	642	30	40	1.4
Sweaters, Other Non-Cot Veg Fibers	845	85	73	1.3
Cotton Sweaters	345	49	68	1.2
M&B Not-Knit Mmf Shirts	640	38	27	1.1
Cotton Dresses	336	47	51	1
W&G Not-Knit Silk Shirts&Blouses	741	0	0	1
Mmf Hosiery	632	48	0	0.9
W&G Silk Knit Shirts & Blouses	739	0	0	0.9
M&B Suit-Type Coats, Wool	433	5	6	0.8
Cotton Hosiery	332	12	2	0.7
Wool Knit Shirts/Blouses	438	3	61	0.7
M&B Sweaters, Wool	445	27	43	0.7
Trousers/Breeches/Shorts, Silk&Veg	847	67	56	0.7
Cotton Skirts	342	31	32	0.6
M&B Wool Trousers/Breeches/Shorts	447	19	8	0.6
W&G Wool Slacks/Breeches/Shorts	448	31	14	0.6
Non-Knit Shirts & Blouses, Silk&Veg	840	24	43	0.6

W&G Cotton Coats	335	46	26	0.5
W&G Silk Coats	735	0	0	0.4
Silk Dresses	736	0	0	0.4
Knit Shirts & Blouses, Silk & Veg	838	30	37	0.4
Other M&B Coats, Cotton	334	48	16	0.3
Wool Skirts	442	31	12	0.3
M&B Mmf Suit-Type Coats	633	19	10	0.3
M&B Mmf Sweaters	645	3	17	0.3
M&B Mmf Down-Filled Coats	653	58	71	0.3
Silk Skirts	742	0	0	0.3
W&G Silk Trousers/Breeches/Shorts	748	0	0	0.3
W&G Coats, Silk & Veg Blends	835	69	37	0.3
Dresses, Silk & Veg Blends	836	0	62	0.3
Other M&B Wool Coats	434	3	2	0.2
Other Wool Apparel	459	22	19	0.2
W&G Mmf Down-Filled Coats	654	64	77	0.2
Silk Neckwear	758	0	0	0.2
Skirts, Silk & Veg. Blends	842	5	9	0.2
M&B Suit-Type Coats, Cotton	333	33	1	0.1
Wool Dresses	436	61	3	0.1
M&B Silk Knit Shirts	738	0	0	0.1
M&B Not-Knit Silk Shirts	740	0	0	0.1
W&G Silk Sweaters	746	0	0	0.1
M&B Silk Trousers/Breeches/Shorts	747	0	0	0.1
Other Silk Apparel	759	0	0	0.1
M&B Suit-Type Coats, Silk & Veg	833	3	1	0.1
Sweaters, Silk Blends	846	5	2	0.1
Other Silk & Non-Cot. Veg Apparel	859	43	24	0.1
M&B Down-Filled Coats	353	75	72	0
W&G Down-Filled Coats	354	77	88	0
Wool Hosiery	432	1	2	0
Wool Shirts/Blouses, Not-Knit	440	10	5	0
M&B Suit-Type Silk Coats	733	0	0	0
Other M&B Silk Coats	734	0	0	0
M&B Silk Sweaters	745	0	0	0
Hosiery, Silk & Veg Blends	832	1	2	0
Other M&B Coats, Silk & Veg	834	55	51	0
Neckwear, Silk & Veg Blends	858	0	0	0

*Note on abbreviations: M&B – Men and Boys, W&G- Women and Girls, Mmf- Man made fiber.