

Exporter adjustment to the end of trade preferences: evidence from the abrupt end of textile & apparel quotas

James Harrigan, University of Virginia¹
JULY 2009

Introduction

Trade policies are often discriminatory: tariffs and quotas apply unevenly to a country's trading partners. Economics teaches that such discrimination can be even more distortionary than an MFN trade policy, since discrimination may lead an importer to inefficiently import from high cost suppliers. This inefficiency is of course costly for the importing country, but it also can distort the global pattern of specialization: countries with preferential access invest too much in providing the protected products, while low-cost suppliers are prevented from fully exploiting their competitive advantage.

These insights from economic theory are the basis of much policy advice, in particular the prescription that if countries need to protect their domestic markets they should do so using nondiscriminatory policies. This note provides empirical evidence to support the theory and policy advice from one of the largest and most abrupt trade policy changes in recent years: the end of the global regime of textile and apparel quotas on January 1 2005. This regime, most well known as the "Multi Fiber Arrangement" (MFA) but re-named the "Agreement on Textiles and Clothing" (ATC) at the conclusion of the Uruguay Round in 1995, was long thought to severely distort global textile and apparel trade, and its demise has confirmed this view.²

¹ Department of Economics, University of Virginia, P.O. Box 400182, Charlottesville, VA 22904-4182, james.harrigan@virginia.edu.

² For simplicity, I will continue to use the older term MFA in the remainder of this note.

This paper, based on my joint work with Geoffrey Barrows (Harrigan and Barrows, 2009), focuses on how exporters to the U.S. market adjusted when the MFA ended³. As discussed in greater detail in Harrigan and Barrows (2009), the bulk of MFA liberalization was put off until the last minute, with the result that U.S. imports of textiles and apparel changed dramatically in 2005 in ways that can be credibly attributed to the end of the MFA. I will show that

- China had been severely constrained by the MFA. Chinese export prices plunged, and volumes soared, when the MFA ended.
- Other low-wage MFA-constrained exporters also saw big increases in their exports to the U.S. in 2005.
- The “East Asian Miracle” exporters saw big drops in export values, despite having large shares of filled quotas in 2004.
- Mexico was a big loser from the end of the MFA, as it lost its previously-privileged access to the U.S. market. Mexican export volumes fell substantially in the face of greater competition from China and other Asian exporters. However, by specializing in goods where Mexico’s proximity to the U.S. gave it a competitive advantage, Mexico’s losses from the end of the MFA were smaller than what some observers had feared.

All figures and calculations in this paper refer to Harrigan and Barrows (2009) unless otherwise noted.

The end of the MFA in the United States

Table 1 summarizes the U.S. import market for apparel and textiles in the last year of the MFA, 2004, and in 2005. In 2004, 17% of U.S. imports came in under a binding quota.⁴ China was the largest exporter, with 21% of the market, but at first glance was not highly

³ For back ground on the rise and especially fall of the MFA, see Harrigan and Barrows (2009), Evans and Harrigan (2005a), and Brambilla, Khandelwal, and Schott (2007).

⁴ A quota is defined as binding if imports are at least 90% of the quota level.

constrained by the MFA: only 18% of Chinese imports came into the U.S. under a binding quota, no different from the overall average. Mexico was the second largest exporter with 10% of the market, and all of its exports arrived unimpeded by quotas. The big South Asian exporters (India, Pakistan, Bangladesh, and Sri Lanka) all had greater shares of quota-covered exports than did China, while the exporters with the highest shares of quota coverage were Hong Kong (50%) and Indonesia (64%).

Overall effects

The low overall quota coverage in the U.S. market in 2004 might at first glance suggest that the MFA was not severely constraining U.S. imports. Similarly, China's fairly modest share of quota-covered exports might be taken as a hint that it was not unduly restricted. The final column of Table 2 shows that such inferences are wrong. When the MFA expired, China's export value exploded by 45%. India (+28), Indonesia (+18), Pakistan (+14), Bangladesh (+18), and Cambodia (+20) also saw double-digit increases in exports. Mexico and Canada, which lost their preferential access to the U.S. market, saw their exports fall by more than 5%.

price and quantity effects

The overall changes in export volumes obscure much of what happened in 2005. Using detailed data and index number theory, Harrigan and Barrows (2009) also compute price, quantity, and quality changes.⁵ Figures 1a and 1b illustrate the first nine columns of Table 2: China's overall quantity of exports grew an eye-popping 150%, an increase driven largely by an incredible 450% increase in exports of previously constrained goods. To achieve this level of sales required big price drops: the price of Chinese exports fell by 10%, almost entirely due to a 40% drop in the prices of previously constrained goods.

Other big exporters saw similar patterns. Pakistan's exports of previously constrained goods grew by over 100%, accompanied by price drops of 18%. The experience of India, Bangladesh, Indonesia and the Philippines was only slightly less dramatic, with quantities

⁵ For details on the calculations, see the box "Measuring price, quantity, and quality change".

of previously constrained goods increasing by around 50% and prices falling by about 9%.

Interestingly, some of the exporters that had the largest shares of quota-constrained exports saw more modest changes in 2005. Hong Kong, which had half of its exports in constrained categories in 2005, saw sales of these goods rise just 17% and prices fell 3%. Korea's exports of previously constrained goods actually *fell* 4%, despite prices that fell by 5%. A similar thing happened to Taiwanese exports of previously constrained goods: they fell 15%, as prices rose 4%.

efficient quality downgrading

A more subtle effect of quotas is to inefficiently raise quality. The reason is that with a quantity constraint, exporters will choose to set prices so that the quota rent per unit quantity is the same. This has the effect of lowering the relative price of high-cost/high-quality goods, thus tilting sales toward these higher-end varieties.⁶ An immediate corollary of this theory is that abandoning quotas should see efficiency-enhancing quality downgrading: the mix of exports should shift toward less expensive items. Table 2 shows some evidence for this phenomenon in the data. In particular, the quality of previously constrained goods from China fell more than 10% (other quality effects in the data are smaller, and Harrigan and Barrows (2009) show that except for China the hypothesis that quality downgrading was random can not be rejected).

Comparative advantage and the end of the MFA

The changes detailed above can be summarized compactly. When the MFA ended,

- China and other low-wage exporters (South Asia, Indonesia, and the Philippines) had huge gains in sales, along with sharp drops in prices.
- The NAFTA exporters saw sales fall modestly, and prices rose somewhat.

⁶ See Falvey (1979) and Rodriguez (1979) for the theory of quality upgrading under quotas, and Boorsten and Feenstra (1991) and Feenstra (1988) for applications.

- The relatively high-wage “East Asian Miracle” exporters (Hong Kong, Korea, Taiwan) saw their value of sales fall precipitously, despite having large shares of their exports in constrained categories in 2004.

This pattern of results is very consistent with a view that competitive advantage in the apparel and textile industry as being driving primarily by low wages. Once China and the other low-wage exporters were no longer constrained, they elbowed aside exporters from relatively high-wage East Asian exporters that, for historical reasons, had large quota allocations under the MFA.

An interesting feature of the results is that Mexico was not hurt as much as some had feared: despite losing preferential access, and in the face of a flood of low-cost imports from the low-wage countries, Mexico’s market share fell only slightly more than one percentage point. Canada’s market share fell by only half of a percentage point. What Canada and Mexico have in common, of course, is a competitive advantage that can not be eroded by shifts in trade policy: proximity to the United States. In Evans and Harrigan (2005b), the authors show that Mexico used its preferential access in apparel and textiles under NAFTA to expand sales disproportionately in goods where timely delivery was valuable to U.S. retailers. My conjecture is that this durable market niche insulated Mexico from the competitive pressures from low cots, but faraway, suppliers in Asia.

winners and losers from the end of the MFA

Changes in economic policy, however salutary in the aggregate, always create winners and losers. A full accounting of the welfare effects of the end of the MFA is beyond the scope of this paper, but Harrigan and Barrows (2009) show that the MFA’s demise saved U.S. consumers about \$7 billion, mainly due to lower prices on Chinese imports.

The gains to U.S. consumers came in large part at the expense of quota license holders in the exporting countries. This raises the possibility that the end of the MFA may have actually made exporters worse off. China is a particularly provocative case: while China increased its market share from 21% to 28%, it accomplished this by lowering prices by

10% overall, and by 38% in previously constrained categories. The partial effect of this terms-of-trade deterioration is negative, although the more effective exploitation of China's comparative advantage in labor-intensive manufactured goods might outweigh the terms of trade deterioration. Similar considerations apply to the other big low-wage exporters (South Asia, Indonesia and the Philippines).

The verdict for the "East Asian Miracle" exporters (Hong Kong, Korea, Taiwan) is unambiguous: their welfare fell as a result of the end of the MFA. This is shown by the drop in overall export value, driven by falling prices, with only Hong Kong seeing any increase in real sales of previously constrained goods. These countries' textile and apparel exports had apparently been driven by quota rent-seeking, and when these rents evaporated the rationale for large-scale exports of labor-intensive apparel and textiles evaporated as well.

Conclusion

The end of the MFA in 2004 led to big changes in the pattern of U.S. imports of textiles and apparel. The new pattern seems much more reflective of comparative advantage: the big low-wage countries, especially China, expanded their sales at the expense of higher-wage exporters that had preferential access to the U.S. market under the MFA. The NAFTA exporters, whose competitive advantage in proximity to the U.S. was not eroded by the end of the MFA, suffered less than higher-wage East Asian exporters who owed their share of the U.S. market to their historically commodious quota allocations.

BOX: Computing price, quantity, and quality indexes

The trade data used by Harrigan and Barrows (2009) come from the Census Bureau, and are analyzed at the 10-digit Harmonized System (HS) level, the most disaggregated classification available. Each import observation includes information on date, source country, value in dollars, and physical quantity (such as number of shirts). The analytical challenge is to aggregate this data into a form that is easy to understand.

Harrigan and Barrows (2009) use modern index number theory to do the aggregation. The basic building block is the Feenstra (1994) index, which allows for changes in the set of goods exported over time. A simplified version of the Feenstra price index, which ignores the new goods correction, is

$$\ln F(\mathbf{p}_t, \mathbf{p}_{t-1}, \mathbf{x}_t, \mathbf{x}_{t-1}) = \sum_{i \in I} w_{it} \ln \frac{p_{it}}{p_{it-1}}$$

where p_{it} is the price of product i in period t , and

$$w_{it} = \frac{s_{it} + s_{it-1}}{2}$$

is the average share of good i in the aggregate in the two periods. In words, the Feenstra index is an expenditure-share weighted average of price changes of individual goods.

For any aggregate Feenstra price index, the corresponding quantity index is computed from the identity that value = price \times quantity.

The computation of the quality index exploits the difference between a price index and a so-called unit value index,

$$UV(\mathbf{p}_t, \mathbf{x}_t) = \sum_{i \in I} \omega_i p_{it}, \quad \omega_i = \frac{x_{it}}{\sum_{j \in I} x_{jt}}$$

where the weights ω_i are quantity weights: the number of units (count, kilos, square meters, etc) of good i as a share of the total number of units in the aggregate. It is clear from the definition that UV can change over time even if no individual prices

change, just by changing the number of units of each good in the aggregate. Boorstein and Feenstra (1991) show that an indicator of quality change over time is given by the difference between unit value and price change. Expressed in logs, change in quality Q is measured as

$$\ln \frac{Q_t}{Q_{t-1}} = \ln \frac{UV_t}{UV_{t-1}} - \ln F(\mathbf{p}_t, \mathbf{p}_{t-1}, \mathbf{x}_t, \mathbf{x}_{t-1})$$

The interpretation **Error! Reference source not found.** is that if the unit value index increases more than the price index, then the quality index rises, reflecting the fact that consumption has shifted towards more expensive goods within the category.

Table 1 - U.S. Apparel and Textile imports, top 20 exporters

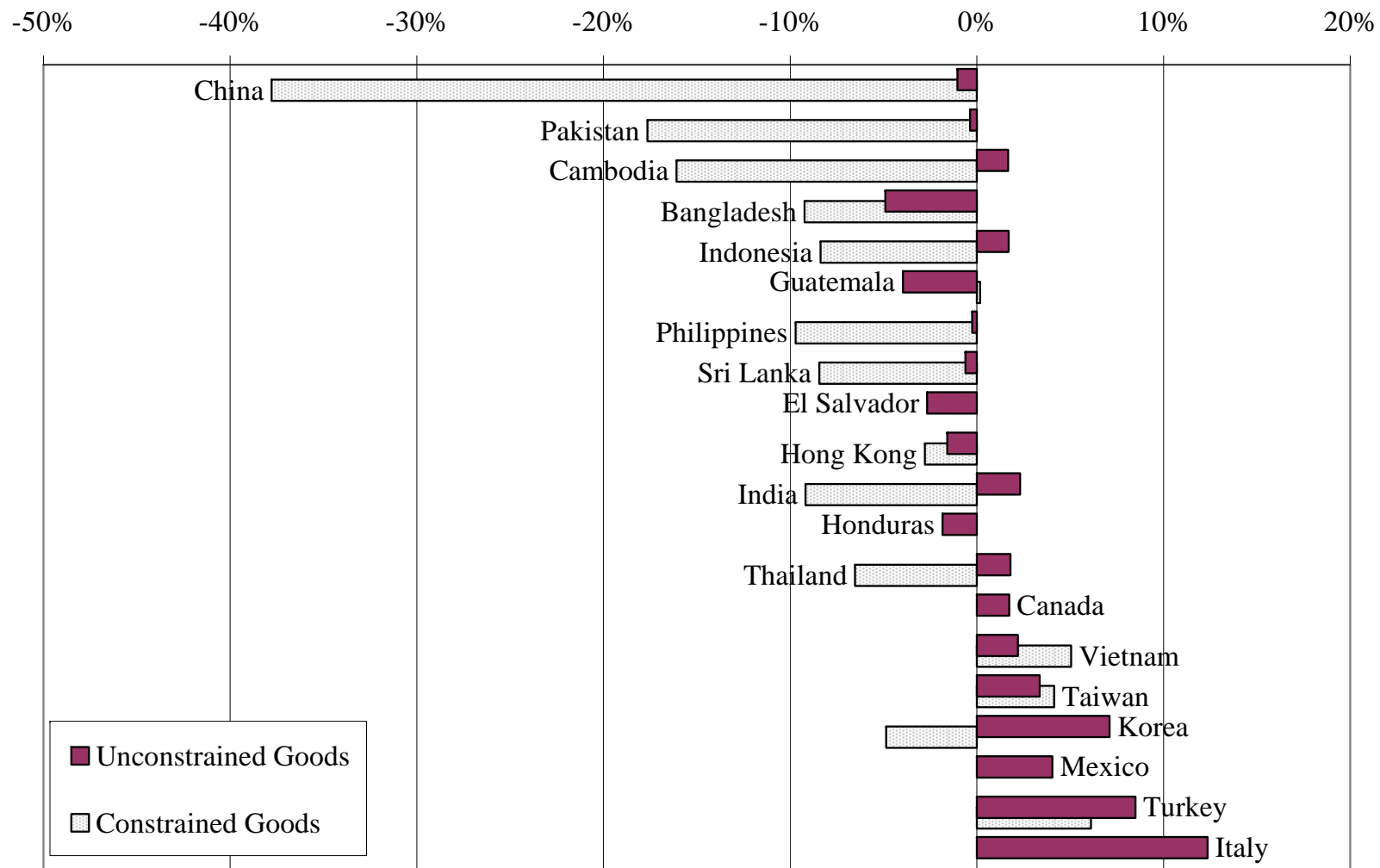
	quota coverage 2004	market share	
		2004	2005
China	18.0	20.7	27.8
Mexico	0	9.7	8.4
India	36.0	4.5	5.3
Canada	0	4.1	3.6
Hong Kong	50.4	3.6	2.9
Korea	27.7	3.4	2.4
Honduras	0	3.1	2.8
Vietnam	29.1	3.1	3.0
Indonesia	64.2	2.9	3.2
Pakistan	42.3	2.9	3.1
Italy	0	2.8	2.5
Taiwan	18.5	2.6	2.0
Thailand	18.0	2.6	2.3
Bangladesh	34.9	2.3	2.6
Philippines	31.6	2.2	2.0
Turkey	2.3	2.0	1.7
El Salvador	0	2.0	1.7
Sri Lanka	28.0	1.8	1.8
Guatemala	0.3	1.7	1.5
Cambodia	44.4	1.6	1.8
Other		20.5	17.5
Total	16.7	100.0	100.0

**Table 2 - Quantity, price, quality and value change 2004-2005,
U.S. Apparel and textile imports, top 20 exporters**

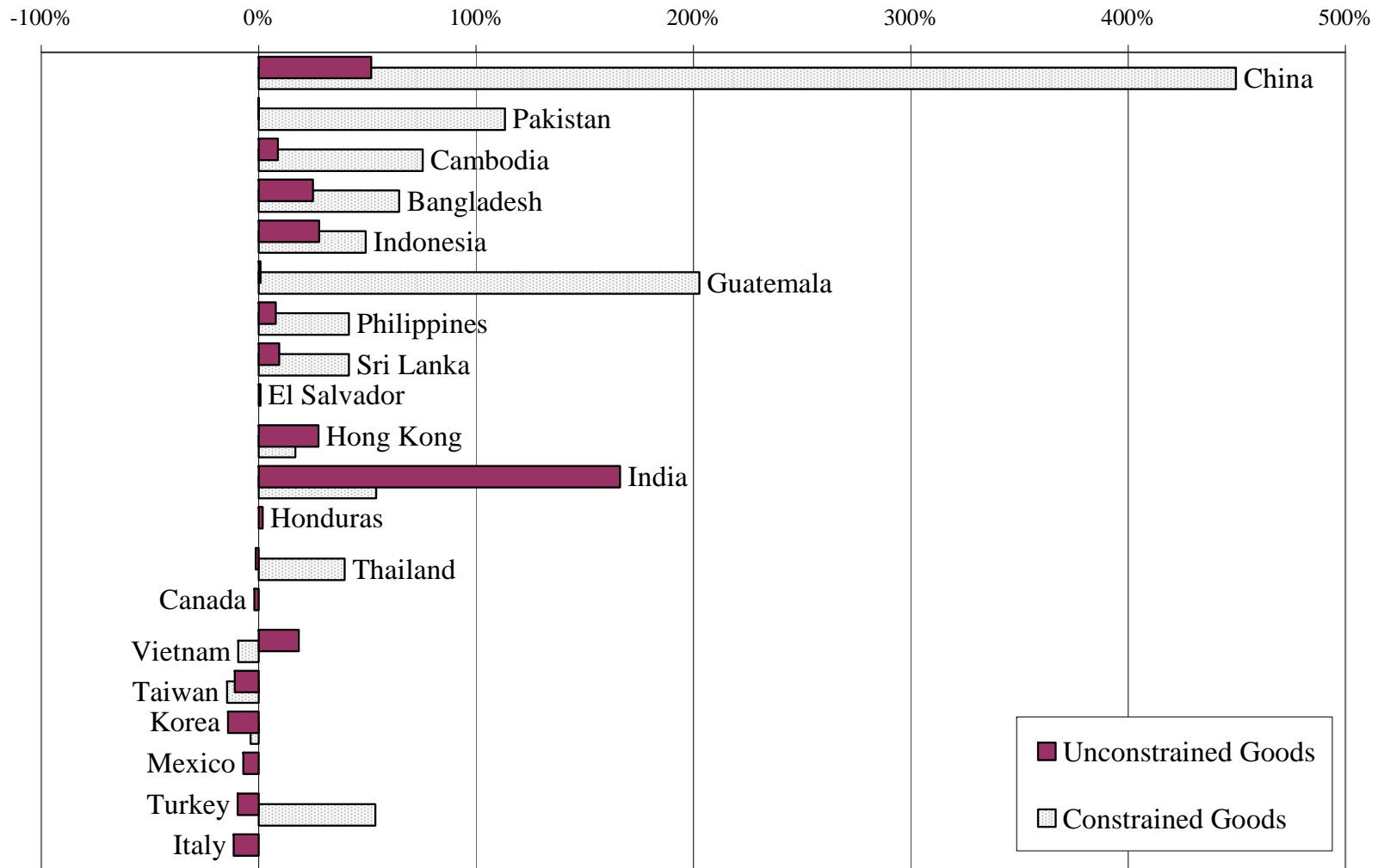
	quantity			price			quality			value
	total	not	bound 2004	total	not	bound 2004	total	not	bound 2004	total
		bound			bound			bound		
China	155.9	51.8	449.6	-10.2	-1.0	-37.8	-3.0	-0.3	-11.2	44.7
Mexico	-7.0	-7.0		4.0	4.0		0.6	0.6		-6.5
India	124.5	166.3	54.1	-1.9	2.3	-9.2	-1.2	-0.4	-2.7	27.6
Canada	-2.0	-2.0		1.7	1.7		-0.9	-0.9		-5.3
Hong Kong	21.8	27.5	16.9	-2.2	-1.6	-2.8	0.6	5.5	-4.0	-13.7
Korea	-11.3	-14.0	-3.7	3.9	7.1	-4.9	-2.3	-1.7	-3.8	-21.9
Honduras	1.8	1.8		-1.8	-1.8		-2.3	-2.3		-1.9
Vietnam	11.0	18.5	-9.4	3.0	2.2	5.0	0.4	0.6	0.0	5.9
Indonesia	41.7	27.8	49.3	-5.0	1.7	-8.4	-1.7	0.4	-2.7	18.0
Pakistan	54.7	-0.1	113.3	-8.6	-0.4	-17.6	0.4	0.5	0.2	14.4
Italy	-11.5	-11.5		12.4	12.4		0.3	0.3		-4.0
Taiwan	-11.7	-11.1	-14.6	3.5	3.4	4.1	0.4	0.7	-0.9	-19.3
Thailand	6.9	-1.4	39.6	0.1	1.8	-6.5	-3.1	-3.3	-2.3	-3.1
Bangladesh	40.0	25.0	64.6	-6.6	-4.9	-9.2	-1.6	-2.1	-0.7	18.8
Philippines	19.2	8.0	41.6	-3.4	-0.2	-9.7	-2.7	-2.2	-3.7	-1.1
Turkey	-7.6	-9.6	53.7	8.4	8.5	6.1	4.6	5.3	-16.6	-8.3
El Salvador	0.8	0.8		-2.7	-2.7		-4.1	-4.1		-6.3
Sri Lanka	19.2	9.6	41.5	-3.1	-0.6	-8.4	-2.4	-2.6	-2.1	5.5
Guatemala	2.3	0.8	202.8	-3.9	-4.0	0.2	-0.4	-0.3	-7.5	-6.1
Cambodia	41.2	8.9	75.5	-7.0	1.7	-16.1	-2.6	0.0	-5.3	19.9

Notes to Table 2: All entries are percent changes between 2004 and 2005. Columns headed “bound 2004” aggregate products subject to a binding quota in 2004, with all other products aggregated in the “not bound” columns.

**Figure 1a - Price changes 2004-2005,
top 20 exporters, ordered by total price change**



**Figure 1b - Quantity changes 2004-2005,
top 20 exporters, ordered by total price change**



References

Brambilla, Irene, Amit Khandelwal, and Peter Schott, 2007, "China's Experience Under the Multifiber Arrangement (MFA) and the Agreement on Textiles and Clothing (ATC)", NBER Working Paper No. 13346 (August).

Boorstein, Randi, and Robert C. Feenstra, 1991, "Quality Upgrading and Its Welfare Cost in U.S. Steel Imports, 1969-74", in Elhanan Helpman and Assaf Razin, Editors, *International Trade and Trade Policy*, Cambridge, MA: MIT Press.

Evans, Carolyn L., and James Harrigan, 2005a, "Tight Clothing: How the MFA Affects Asian Apparel Exports", *East Asian Seminar on Economics 14: International Trade*, Chapter 11, 2005, Takatoshi Ito and Andrew Rose, Eds., University of Chicago Press.

Evans, Carolyn L., and James Harrigan, 2005b, "Distance, Time, and Specialization: Lean Retailing in General Equilibrium", *American Economic Review* 95 no. 1 (March): 292-313.

Falvey, Rodney E., 1979, "The composition of trade within import-restricted categories", *Journal of Political Economy* 87 (5): 1105-1114.

Feenstra, Robert C., 1988, "Quality Change under Trade Restraints in Japanese Autos", *Quarterly Journal of Economics* 103:131-146.

Feenstra, Robert C., 1994, "New Product Varieties and the Measurement of International Prices", *American Economic Review* 84 (1): 157-177 (March).

Harrigan, James, and Geoffrey Barrows, 2009, "Testing the theory of trade policy: Evidence from the abrupt end of the multifiber arrangement", *Review of Economics and Statistics* 91 (2): 282-294 (May).

Rodriguez, Carlos Alfredo, 1979, "The quality of imports and the differential welfare effects of tariffs, quotas, and quality controls as protective devices", *Canadian Journal of Economics* 12 (3): 439-449.