The Liberalization of Trade in Textiles and Clothing: China’s impact on the ASEAN economies

Junyuan Christopher Tan
Department of Economics
Thesis advisor: Professor Ronald McKinnon
Stanford University, Stanford CA 94305, USA
Email: chris.tan@stanford.edu

May 4, 2005

Abstract

On January 1, 2005, quotas on textile and clothing trade were lifted. With this, US and EU price-competitive clothing imports from China soared. Recent talk of quota safeguards notwithstanding, this has development implications for other, relatively uncompetitive, countries—especially those heavily reliant on textile and clothing exports. This study examines the effect that China will have on the Southeast Asian countries, as part of a bigger picture of economic competition and cooperation within Asia. The Southeast Asian countries are found to have a more competitive than complementary relationship with China in this sector. Using a constant elasticity of substitution model, this paper then finds a significant negative effect of quota-abolition on the Southeast Asian countries. However, a paradox is found. Though China should out-compete all the Southeast Asian countries based on supply-side competition, this is not reflected in actual growth patterns, where some Southeast Asian countries see robust growth in the US market, as well as the Japanese non-quota market. This could be due to ongoing expansion of the import markets, as well as other supply-side trends such as changes in comparative advantage. The outlook for the Southeast Asian countries is thus less bleak than most predict.

Keywords: apparel, trade restrictions, Multifiber Agreement (MFA), Agreement on Textiles and Clothing (ATC)

* I am extremely grateful to my thesis advisor, Prof. Ronald McKinnon, for his invaluable time, questions, suggestions and corrections. His patience and guidance were essential for helping me find direction and eventually complete this project. I would also like to thank C.H. Kwan and Prof. Peter Hansen for helpful suggestions during the early stages of this project. I am also thankful for Prof. John Shoven, my major advisor, who provided guidance and a listening ear when I started to become serious about Economics. Last, but definitely not least, my gratitude goes out to all those, friends and family, who provided me with support over the course of this project. All errors are my own.
Table of contents

1. Introduction .................................................................................................................. 3

2. The Textile and Clothing Industry: a Brief Overview ........................................... 5

3. The Multifiber Agreement, and the Agreement on Textiles on Clothing (ATC) .......... 9
   3.1. An Economic History of Global Trade Agreements on Textiles and Clothing .. 9
   3.2. The Impact and Demise of the ATC: Now what? ............................................. 13

4. Textiles and Clothing in China and Southeast Asia .................................................. 22
   4.1. The Flying Geese model of Asian Economic Development ......................... 22
   4.2. The Textile and Clothing industry in China and ASEAN .......................... 25
   4.3. Competitive Issues for the ASEAN countries ............................................. 34
   4.4. Trends in ASEAN exports to major markets .............................................. 37

   5.1. Reviewing the Armington model ................................................................. 40
   5.2. Applying the Armington model to Quotas on Textiles and Clothing ............ 42
   5.3. A Description of the Panel Data ................................................................. 45
   5.4. Regression Specification ............................................................................. 46
   5.5. Estimation results and discussion .............................................................. 52

6. Conclusion .................................................................................................................. 62

References ..................................................................................................................... 66

Appendix I: Acronyms used ......................................................................................... 69

Appendix II: Constructed classifications ..................................................................... 70

Appendix III: Graphs of China and ASEAN presence in major import markets ........... 71

Appendix IV: Mathematical appendix ....................................................................... 75

Appendix V: US Import elasticity estimates from Gallaway et al. (2003) ...................... 77
1. Introduction

On January 1, 2005, the fog of five decades of a quota-protected trade regime finally lifted with the final conclusion of the Agreement on Textiles and Clothing. With this, heavy quota restraints on China were removed, effectively freeing China to fully partake in the gains from trade in this sector. This quite unprecedented event attracted (and continues to attract) heated debate over whether transitional safeguards should be imposed, with representatives from various interest groups pushing their own sides across. These worries arise from China’s rise as a major textile and clothing exporter, and especially China’s capability in clothing production with a pool of efficient and cheap labor. From 1992 to 2003, China’s market share of the world clothing market rose from 12.6% to 23.0%. Furthermore, this occurred while the country was still shackled by the punitive quota regime.

To ward off safeguards, China imposed export tariffs of 2 to 6 US cents per item on many different categories of textile and clothing exports. However, this was but a token gesture: adding fuel to the fire, initial data released by the US Department of Commerce indicate that in February 2005, year-to-date data for China’s clothing exports to the US showed an increase of 106.1% by volume and 88.0% by value. Non-apparel exports likewise increased by 36.1% in volume and 36.0% in value (Department of Commerce, 2005). The US data should nevertheless be taken in light of the statistic that clothing imports from one of the biggest “losers”, Hong Kong (of which pass-through trade from China may make up a large part), dropped 26.4% by volume and 14.3% by value. In all, the rise in clothing imports from both China and Hong Kong, combined, rose by 75.5% by volume and 55.5% by value. Similar data compiled from Chinese customs data indicates that China’s exports to Europe rose by 46% in January (Financial Times, 2005)\(^1\).

\(^1\) At the time of writing, data on Hong Kong’s clothing exports to the EU are as yet unavailable.
In this context, the aim of this study is to analyze the likely impact that the freeing of China’s shackles will have on the ASEAN economies. This is but one part of a bigger issue, that of the general impact that the rising monolith of China in Asia will have on these much smaller economies. The ASEAN economies see extremely wide disparities in their levels of economic development, implying that the impact will necessarily differ from country to country. Some of these countries, such as Cambodia and Laos, are heavily reliant on clothing exports. If they are driven out of the market by China, several years of industrial development will come to naught. We thus make some projections on the likely repercussions for the region’s countries, first on their textile and clothing manufacturing sector, and next on their exports in general. Will they still be able to compete with China in this particular sector?

This study is made out of four sections, each building on its predecessor. Chapter 2 begins by breaking the textile and clothing industry into segments for the purpose of gaining insight into the supply chain that exists here. Next, chapter 3 delves into the historical background of the Multifiber Agreement and the Agreement on Textiles and Clothing and also conducts a brief literature review into the general impact of the MFA phaseout. This done, we analyze the importance and industrial structure of China and ASEAN in the textiles and clothing industry; this is done over the course of chapter 4. Finally, in chapter 5, a theoretical model is used to quantify and estimate the likely impact on the ASEAN economies, and the results of econometric analysis are presented.

---

2 Singapore, Malaysia, Thailand, Indonesia, Philippines, Brunei Darussalam, Cambodia, Laos, Myanmar, Vietnam.
2. The Textile and Clothing Industry: a brief overview

Let us now look at the fiber, textile and apparel industry, that will be henceforth referred to as the textile and clothing (T&C) industry. It is widely viewed as the first industrial base from which countries develop economically, and hence is important for gaining a perspective on development in ASEAN, especially if the poorer members of ASEAN are to eventually catch up.

However, before we delve into further analysis, it is important to outline the structure and intricacies of the textile and clothing industrial process. Different steps of the textile and clothing supply chain require very different skills and technologies. The industry is presented in four different segments, outlined below, with each segment 1, 2, 3, and 4 linked by a process a, b, or c. The term “textiles” refers to items produced at stages 2 and 3, though primarily at stage 3. Some textiles are used as final products (e.g. towels), and others as intermediate products, such as fabric for clothing production. For simplicity, textiles are classified into the stages that a particular product is close to. For instance, towels are classified as fabrics, as the production processes for these are similar to those of fabrics. These processes may occur separately, with each intermediate (or final) product shipped elsewhere for sale or processing. Alternatively, they may all occur within a vertically integrated textile mill, processing fibers into yarns, and fabrics and final products.

As one moves downstream, from fiber-making to spinning, yarn processing, then cutting and making, the processes become more and more labor-intensive and less capital- and knowledge-intensive. Converting fabrics into final products such as clothing, for instance, is much more labor-intensive than spinning fibers into yarns. The value-added of each conversion also declines as one moves along the supply chain. In 1969, however, the invention of the automatic cutting machine made it possible to cut thick layers of cloth efficiently and accurately,
Figure 1: Products of the fiber, textile, and apparel industries

1. Fibers
   - Natural fibers (Agricultural sector):
     - e.g. cotton, wool, silk.
   - Manmade fibers (Chemical industry):
     - Synthetic fibers, e.g. polyester, nylon.
     - Artificial fibers, e.g. rayon, acetate.

2. Yarns
   - Spun
     - e.g. cotton & manmade fibers, wool
   - Filament
     - e.g. silk

3. Fabrics
   - Woven, e.g. denim, sheeting
   - Knit
   - Nonwoven
   - Industrial fabrics
   - Other final textiles

4. Clothing
   - Apparel
     - e.g. shirts, blouses, trousers, shorts, skirts, underwear

improving the quality of clothing manufacture. These cutting machines are moreover automated, and designs can be fed into the cutting machines directly. This occurs, however, at the pre-assembly stage of clothing manufacture, and the overall process is still labor-intensive (Nordas, 2004).

As one moves down the supply chain, the scale of operations also tends to decline, and the number of firms increases (USITC, 2004). In the latter half of the 20th century, this resulted in the migration of fabric and apparel production—the last two stages on the supply chain—to areas with lower labor costs. The USITC notes that especially during the last two decades, textile and apparel production has moved out of developed countries and into developing countries.

This industrial migration of textiles has been especially prominent in Asia. In the 1960s and 1970s, three Asian Tiger economies became low-cost exporters of apparel. In the early 1980s, these countries supplied almost 30% of world apparel exports (USITC, 2004). The 1980s, however, saw other countries such as China, India, Thailand, Indonesia, and the Philippines emerge as low-cost exporters. Over the next few decades, it is also likely that the Asian exporters will remain dominant because of their low costs, and also investment in production equipment during the 1990s. It should be noted at this point that the migration of the textile and apparel export industry within Asia is a key component of the Flying Geese Model of economic development, which will be covered later in this essay.

Another aspect of the growing internationalization of production is that of the integrated supply chain. Coupled with international trade, the trend along the supply chain to become more and more labor-intensive as one reaches the final stage creates a potential for countries to specialize in different areas, depending on their factor endowments and technological levels. Nordas (2004) notes that the decision on where to locate each individual component in the
supply chain is made with many variables in mind, with costs, access to inputs, and transport and transaction costs being some of them. More efficient shipping methods then increases access to inputs and decreases transport costs for any country wishing to specialize at any stage of the production process, making it easier to do so. Indeed, as Nordas (2004) points out, intermediate inputs cross borders several times before the final product reaches the final import market.
3. The Multifiber Agreement (MFA) and the Agreement on Textiles and Clothing (ATC)

3.1. An Economic History of Global Trade Agreements on Textiles and Clothing

Throughout this process of worldwide industrial growth through textile and apparel exports, a common theme emerged: that of trade restrictions placed on those countries that were major exporters of textile and apparel. We next explore the history of these restrictions in order to throw some light on why 1 Jan 2005 might bring about a large shift in the world apparel export structure. However, before delving into its history, it is be essential to cover the basic economics of these quotas.

Quotas in general transfer economic rents from consumers in the importing country to producers in the exporting country. To illustrate this point, assume that Figure 2 below represents the demand and supply for clothing imported from China. With decreasing returns to scale, $Supply_0$ applies, and with constant returns to scale, $Supply_1$. We first analyze the decreasing returns to scale case. Without market restrictions, at the market equilibrium consumer surplus is $A+B+C$ in Figure 2 below, and producer surplus is $D+E+F$. With a quota of $Q_1$, the market price is $P_1$. Consumer surplus drops to just $A$. However, as opposed to a tariff, the US government raises no revenue. Instead, the producers in China who hold import licenses are producing at a cost of $P_2$, and hence collect quota rents of $Q_1 \times (P_1 - P_2)$. Producer surplus is now $B+D+F$.

![Figure 2: The effect of quotas](image)
In the constant returns to scale case, consumer surplus again drops to A. However, original producer surplus was 0, and now increases by a quota rent of B.

The textile and clothing sector in the US and Europe has been protected by such quota systems since the 1950s, when Japan, Hong Kong, China, India and Pakistan agreed to impose voluntary export restraints on their cotton textile exports to the US. The Short Term Arrangement (STA) on cotton textiles was then signed in 1961, which were aimed at avoiding “market disruption”. Francois (2004) points out the loose definition of market disruption here effectively allowed the importing countries to single out particular products and particular countries for trade restrictions. Subsequently, a set of bilateral quota agreements, the 1962 Long Term Agreement Regarding International Trade in Cotton Textiles (LTA) was signed under the then-General Agreement on Trade and Tariffs.

The LTA was renegotiated several times, and in an attempt to streamline these multiple arrangements restricting textile and clothing imports, they were replaced by the MFA in 1974. The MFA extended the LTA’s coverage to wool and manmade fibers. It was eventually renegotiated four times, expiring in 1994. As in the preceding arrangements, the signatory importing countries were allowed, through a framework of rules, to effectively impose discriminatory quotas in areas where increase in imports had the potential to cause “market disruption”. A growth rate, however, was imposed on the quotas. During this period, the EU, Austria, Canada, Finland, Norway, and the US applied the quotas almost exclusively to developing country exports. Two other signatories, Japan and Switzerland, did not impose MFA quotas but instead viewed their act of being signatories as a signal that they were ready to apply quotas if needs be (Francois, 2004).
In 1995, the MFA was replaced by the 1995 Agreement on Textiles and Clothing (ATC), with the advent of the World Trade Organization (WTO). The ATC was meant to be a transitory phase between the MFA and the full integration of the textile and clothing industry into the multilateral trading system; Canada, the EU, Norway, and the US carried their MFA restrictions into the ATC. Nevertheless, the list of products under the ATC was greater than the list under the MFA, and some may view this as a base from which to view liberalization in the textiles industry in a more negative light. This transitory phase under the ATC is then best characterized by two processes. The first of these is the integration of products into the GATT and out of the ATC. The second is an increase in the quota growth rates that remain under the ATC, allowing developing countries to export more goods under restriction. For instance, if quota growth rates were originally 5%, then they had to increase to 5.8% \( (5 \times 1.16 = 5.8) \) on 1 January 1995. The timeline for these events was as follows.

<table>
<thead>
<tr>
<th>Date</th>
<th>Minimum volume integrated into GATT</th>
<th>Accumulated volume integrated into GATT</th>
<th>Growth rate of remaining quotas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Jan 1995</td>
<td>16%</td>
<td>16%</td>
<td>16%</td>
</tr>
<tr>
<td>1 Jan 1998</td>
<td>17%</td>
<td>33%</td>
<td>25%</td>
</tr>
<tr>
<td>1 Jan 2002</td>
<td>18%</td>
<td>51%</td>
<td>27%</td>
</tr>
<tr>
<td>1 Jan 2005</td>
<td>49%</td>
<td>100%</td>
<td>Full integration</td>
</tr>
</tbody>
</table>


Here, the “growth rate of the remaining quotas” is a cumulative figure. For instance, an initial growth rate of 5% would eventually be 9.2% \( (5 \times 1.16 \times 1.25 \times 1.27 = 9.2) \) by 1 January, 2002.

The importing countries are free to unilaterally choose which products that they want to integrate at each stage, the only condition being that they have to choose some from each of the following categories: tops and yarns, fabrics, made-up textile products, and apparel. These correspond to all but the first, the fiber-making stage, of the supply chain process outlined in
Figure 1. Also, each importing country was also allowed to apply for special transitional safeguards, and impose new trade restrictions when imports of a product cause serious harm to domestic industries. These safeguards, however, were not supposed to reduce trade below the import volume over the previous 12 months for the country taking the action, and were only supposed to be maintained for three years. If they were maintained beyond 3 years, they had to provide for a 6% annual quota growth.

Since 1995, there has been full legal compliance with the commitments. However, Nordas argues that that the progress of the integration process has been extremely limited (2004). First, the safeguard measures have been used extensively. Also, he notes that the countries chose to first integrate the products that had not been previously under the MFA and that were therefore unrestricted. The Textiles Monitoring Body (TMB) then found that after integrating the unrestricted products, the countries then chose to integrate products that had a low quota utilization rate. Martin et al. (2004) point these products out as ones in which the developing countries had little comparative advantage in. For instance, in the third stage, Canada chose to integrate 27 constraints, and out of those, 19 had a utilization rate of less than 50% in 2000. Likewise, 28 of the 37 constraints the EU chose to integrate, and 21 out of 43 that the US chose, had a utilization rate of less than 50%. The TMB found that of the more sensitive clothing constraints, Canada had only eliminated 7% of them before 2005, the EU, 6%, and the US, 6.5%. They argue that this, and the large number of constraints that had yet to be integrated before 2005, show a large amount of back-loading, and that the most sensitive products had been left to the final stage of integration. They also found that that the proportion that represented real trade liberalization in the ATC was in the range of 0-3% of the 1990 import value covered by the ATC
Francois (2004) further concurs that back-loading is a very real concern among policymakers who have analyzed with the ATC.

Such back-loading might even continue after the end of the ATC. As part of China’s 2001 WTO accession, there were two provisions signed. First, there is a textiles safeguard provision that is effective until December 2008. It enables WTO members to restrict imports from China in the textile and clothing sector if these threaten to disrupt international trade patterns. Second, there is a transitional mechanism that is valid until December 2013, similarly aimed at stemming imports from China to prevent disruption to domestic markets. Since the end of the quota regime on January 1, 2005, there have been numerous news articles documenting political lobbying to impose these safeguards.

3.2. The Impact and Demise of the ATC: Now what?

As such, when full trade liberalization took place on Jan 1, 2005, barring unilateral restrictions placed on textile and clothing imports by developed countries, many analysts predicted a huge and sudden impact on the structure of the world textile and apparel trade. This, rather than the culmination of the gradual integration process envisioned by those who crafted the ATC. This impact has three dimensions: first on the consumers and producers in the importing country, second on the overall size of the import pie, and third on the way the pie is divided up between different exporters.

As in Figure 2, taking the quota-restricted countries as a whole, consumer surplus with regard to their goods will increase again to A+B+C. Consumers in the importing countries which imposed quotas will thus benefit from increased consumption with the removal of quotas. Producers in the importing country, on the other hand, were previously protected by the quota
regime. In many developed countries, there is the worry that they will be out-priced and out-competed by cheaper imports, with repercussions for employment in the domestic textile and clothing industries.

With the removal of restrictions on trade in the textiles and clothing sector, the overall size of the import pie is likely to increase, as is overall worldwide trade in textiles and apparel, with the removal of these quantitative restrictions. Several quantitative studies have attempted to quantify this increase. Diao and Somwaru (2002) estimate that over the 25 years following the abolishment of quotas, total growth in the textile and apparel sector would be 5% higher in total than it would have been otherwise. These figures should furthermore be taken in context of the current annual growth in the textile and apparel trade, which has averaged 6.5% per year over 1991-2003 (Source: UN Comtrade database).

The third dimension of the quota removal process is that of the way the import pie is divided up between the various exporters, and this is the main focus of our essay. Any analysis here, however, has to be done in the context of the previous dimension of the overall size of the pie. A particular exporter’s fraction of the pie may shrink, but if the size of the pie has increased, his export value may yet remain constant or even increase. For each exporter, this makes the quota-removal process a double-edged sword. The upside is that global trade is likely to increase. This is further augmented by the removal of quotas on his exports. However, the downside of quota-removal is that his competitors will likewise no longer be restricted by quotas. The market will become more competitive.

One way in which this downside may manifest itself is through the flow of foreign direct investment out of previously-unrestricted countries, and into previously-restricted countries. This is because of the process known as quota-hopping via foreign direct investments (Whalley,
This phenomenon occurred as a result of the trade restraints under the MFA, and then the ATC. These FDI flows went out of countries with many restrictions on them, to those with few restrictions to take advantage of these favorable allocations. Many poor Asian and African economies rely on clothing exports as a key component of income, and were the main beneficiaries of quota-hopping FDI. With the termination of the MFA and the integration of the textile and clothing industry into the multilateral trading system, it is possible that such FDI may be withdrawn in an attempt to consolidate production operations and costs. In the context of this paper, since China is a heavily restricted country and the poorer ASEAN countries such as Cambodia, Vietnam and Myanmar less so, it is quite possible that Chinese FDI may be withdrawn from these countries, and injected (or re-injected) into the Chinese economy. This is especially likely in light of the aforementioned lack of liberalization prior to Jan 1, 2005.

An indicator of the likely impact of a quota’s removal is thus the degree of restrictiveness of the quota. This degree of restrictiveness may be measured in two ways. The first of these is that of the quota fill rates; or the proportion of quotas available to each restricted country that are actually utilized. However, these fill rates are difficult to interpret as they depend on the method used to allocate the quotas. A utilization rate of less than 100% does not necessarily indicate that a quota is not fully utilized. Whalley (1997) points out the problem of group quotas, or a joint quota placed on two different categories that is more restrictive than the individual quotas. As such, quota rates of 90% and above are generally considered binding in the literature on the MFA and ATC. The system of these quotas is complex, and based on the Harmonized System 1996 classifications; each quota category corresponds to certain HS 1996 classifications. The fraction of quota categories that were binding in 2004 for the US and EU import markets is shown below. The main taking from the data is that first, there were more quotas imposed on
China’s exports than on the exports of the ASEAN countries. Second, a much larger fraction of these quotas were binding for China—though this number may be understated for the ASEAN countries, especially if the categories that are binding take up a large proportion of their exports.

**Table 2: Fraction of quotas that were binding, 2004.**

<table>
<thead>
<tr>
<th>Country</th>
<th>US</th>
<th>EU</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>31/87</td>
<td>26/42</td>
</tr>
<tr>
<td>Singapore</td>
<td>1/28</td>
<td>0/10</td>
</tr>
<tr>
<td>Malaysia</td>
<td>3/44</td>
<td>1/12</td>
</tr>
<tr>
<td>Thailand</td>
<td>1/46</td>
<td>1/16</td>
</tr>
<tr>
<td>Indonesia</td>
<td>11/45</td>
<td>3/13</td>
</tr>
<tr>
<td>Philippines</td>
<td>10/33</td>
<td>1/11</td>
</tr>
<tr>
<td>Cambodia</td>
<td>3/13</td>
<td>Surveillance</td>
</tr>
<tr>
<td>Laos</td>
<td>0/1</td>
<td>Surveillance</td>
</tr>
<tr>
<td>Vietnam</td>
<td>1/25</td>
<td>3/29</td>
</tr>
</tbody>
</table>

Source: US Customs and Border Protection, EU’s SIGL

However, Panagariya et al. (1996) point out that many studies have found quota rents to be high in many countries, even when quotas are not binding. Another estimate of the restrictiveness of a quota is thus the export tax equivalent. As mentioned earlier in this section, the allocation of export licensees is left to the exporting countries, resulting in a quota rent for the exporting country. However, each individual firm in the quota-restrained country has to acquire an export license in order to be able to export. These quotas may be acquired through a well-organized quota market. For instance, one could participate in auctions to purchase quotas in China through <http://www.chinaquota.com>. In Pakistan, too, one could purchase quotas through auctions conducted by the Export Promotion Bureau (Martin et al, 2004). Often these export licenses were acquired at a cost; the more restrictive a quota is to a country, the higher the cost will be and therefore the higher the implicit tax associated with the quota.

Many studies have tried to estimate these export tax equivalents, and have used various methodologies such as auction prices, interviews with market participants (Kathuria et al, 2003), and information contained in the GTAP general equilibrium database (Nordas, 2004). However,
these estimates are generally sensitive to the timeframe in which they are calculated because of problems such as seasonal variations and auction-specific circumstances. However, generally they do indicate that the export tax equivalents on the Asian countries are higher than those on countries in other regions. To eliminate this timeframe-sensitive effect, Martin et al. (2004) take weighted averages over a 2-year period and over all textile and clothing products exported. In their study, “clothing” refers to stage 4 of the supply chain in Figure 1, and “textiles”, to stages 2 and 3. They use quota price information garnered from auction results for some countries, and when they had no estimate of quota prices, they used interpolation to compare the particular country’s quota utilization rate to other countries with comparable utilization rates. Their estimates for the export tax equivalents in the USA and the EU are presented below in Table 3. Note that the export tax equivalents on clothing are much higher.

<table>
<thead>
<tr>
<th></th>
<th>Export tax equivalent (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Textiles</td>
</tr>
<tr>
<td></td>
<td>USA</td>
</tr>
<tr>
<td>China</td>
<td>20.0</td>
</tr>
<tr>
<td>Hong Kong, China</td>
<td>0.0</td>
</tr>
<tr>
<td>Thailand, Indonesia, &amp; Philippines*</td>
<td>0.0</td>
</tr>
<tr>
<td>South Korea &amp; Taiwan*</td>
<td>0.0</td>
</tr>
<tr>
<td>India*</td>
<td>3.0</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>0.0</td>
</tr>
<tr>
<td>Pakistan</td>
<td>9.8</td>
</tr>
<tr>
<td>Sri Lanka*</td>
<td>0.0</td>
</tr>
</tbody>
</table>

* Not based on actual quota price information; interpolation methods used.

Source: Martin, Manole, & van der Mensbrugghe (2004)

Martin et al. (2004) point out, nevertheless, that despite this averaging their estimates are still subject to much uncertainty because of the variability in quota prices. For instance, the estimated tax equivalents on China’s textile exports was only 1.0%. The quota utilization rate for this category, however, was 97% over the period in which Martin et al. calculated the tax equivalents.
Once again, the main taking from this table is that the export tax equivalents on the quotas that restrict Chinese exports are much higher than those on other countries. Martin et al. (2004) point out that this is largely due to discriminatory quota growth rates. Utilizing data from the International Textile and Clothing Bureau, they calculate that from 1994 to 2004, clothing quotas on China increased by 41% for the US and 38% for the EU-15. This is very small compared to more than 100% growth for many other countries. Indonesia, for one, saw these grow by 117% and 133% respectively. There was a similar pattern in the market for textiles, with China’s quotas growing by just 33% for the US and 50% for the EU-15.

These relatively extremely heavy restrictions for China indicate that China looks set to flourish in the post-quota world when they are lifted. Many simulations have been conducted to assess the impact of the ATC’s demise, and most of them center on the Global Trade Analysis Project (GTAP) database. The GTAP’s general equilibrium simulations assume a constant elasticity of supply (CES) model of import demand, and seek to estimate the effect of the abolition of the ATC’s quotas via simulations of the elimination of the export tax equivalents on all countries. They thus assume that all competition is embodied in prices.

These simulations generally find that textile and clothing exports from Asia will increase, at the expense of both developed country exporters, and developing country exporters from other regions (including Latin America and Africa). Diao and Somwaru (2001), for instance, predict that non-quota-restrained developing countries will lose 20% of their markets to the quota-restrained ones. Along the lines of the previous analyses, they also find that China seems poised to be the biggest benefactor.

However, it is important to note that heavy restrictions on China would not mean anything without the country having the capacity to take over the market. Statham (2004) points
out that China has strong cost advantages that will translate into price competitiveness. There are efficient port facilities, a strong domestic industry for intermediate inputs for the textile and clothing industry, and most importantly, a large, highly productive, and low-cost labor force. Moreover, China’s National Bureau of Statistics indicates that between 2001 and 2003, capital investment in the textiles and clothing sector increased by 77% a year (Statham, 2004). As an indicator of how low China can go, we look at the export prices of China’s clothing exports as a percentage of the price level of all other exporters. Price levels are calculated from OECD data by dividing import value by import quantity. These are graphed for the three major import markets—the US, the EU and Japan, below. Japan, being a quota-free market, can be used as a benchmark for comparison. While the restrictions on China seem to have loosened in the most recent years, again the restrictions on the US market seem to be the highest, and those on the EU somewhat lesser. These indicate that China’s clothing prices in the US (or EU) could drop from 98% (67%) of prices offered by the rest of the world, to the 51% level indicated by the Japanese market.

**Figure 3: China’s clothing price level compared to Rest of World (1991-2003)**

*1995-2003 for the EU-15
Source: OECD, author’s calculations
A caveat to this projection is that it assumes that the composition of China’s competitors is the same across the three markets. In reality, the participants in the Japanese market are the Asian exporters, widely considered to be more cost competitive, and the US and EU markets also see the strong presence of the less developed Latin American or Eastern European countries, respectively. These latter countries may be less competitive than the Asian exporters. The true extent of China’s price advantage may be even understated.

It would also be instructive to examine the potential of China’s production capacity. A measure of China’s clothing export ability post-quota-regime is to compare the market share growth in the quota-restricted markets to that of non-quota-restricted markets. James (2004) adopts this stance, pointing to China’s dominance in the Japanese and Australian import markets, where no quotas are present. In 2003, China accounted for some 80% of Japanese clothing imports, and 70% of Australia’s. The stark difference in China’s export performance in quota and non-quota markets is clear in Figure 4 below. From 1991 to 2003, China’s market share in the EU, however, remained constant at about 22-24%, indicating that quota growth at least kept some pace with market growth. China’s market share in the US, however, shrunk from 30% to 21% (indicating that quota growth lagged behind market growth) before increasing again in 2002 and 2003. This latter increase comes after its WTO accession, and the January 2002 removal of several binding quotas on items such as dressing gowns and knitted fabrics as part of phase III of the ATC. Against the sluggish growth (or non-growth) in these markets, China’s share of the Japanese import market skyrocketed from 40% to 80%.

---

3 Here, we aggregate China’s and Hong Kong’s market share, to account for pass-through re-exports Hong Kong.
The evidence thus indicates that in the MFA and ATC regimes, China was subject to extremely heavy restrictions. The high aforementioned quota fill data and export tax equivalents are evidence of this, as is the shrinkage in China’s market share in the US. When these restrictions are released, the size of the textile and clothing export market pie will likely increase, and it seems that China is well-positioned to gain a much larger size of the pie, both with a large pool of cheap labor, and heavy investment in manufacturing machinery. Other countries will be affected, and the question that then arises is, how badly will they be affected? It is to these repercussions for the ASEAN economies, that we now turn.
4. Textile and Clothing in China and Southeast Asia

4.1. The Flying Geese Model of Asian Economic Development

To understand the impending impact on ASEAN economies, we first lay down a framework outlining the relevance and importance of the textile and clothing export sector to economic growth and development in Asia. We start off from an economic theory in which countries enjoy comparative advantage in a particular product, according to their level of development. As noted earlier, stages 3 and 4 in figure 1 are labor-intensive. Diao and Somwaru (2002) note that developing countries have a comparative advantage in these stages, with their relative abundance of labor and scarcity of capital. As such, stage 4 (clothing), and later stage 3 (fabrics), is often synonymous with a country’s first stage in industrialization and economic growth, allowing them to diversify their domestic production capacity beyond primary products. These industries also have a further advantage over primary products, in that their products are not income inelastic; their demand grows in both developed and developing countries.

Industrial growth in stages 3 and 4 help firm linkages between the textile and clothing industry and other economic sectors, both agricultural and non-agricultural. A demand for agricultural inputs or textile-making machinery helps stimulate demand and development in these industries. Export growth in these areas allow a country to acquire disembodied technology in the form of marketing, advertising, and communication skills, all of which form the foundation for many modern economic activities (Diao and Somwaru, 2002). This theory of industrial upgrading and development was first formalized in the Flying Geese Pattern of Economic Development and was subsequently empirically extended to dynamic changes within countries (Kwan, 2001).
Kwan (2001) outlines the process as one in which a country sees life-cycles within specific industries, where comparative advantage (or perhaps competitiveness) in one industry gives way to another over time. These changes are based on capital accumulation within a country, coupled with forward and backward linkages with other industries. Capital accumulation can result in the rise of a particular industry, creating comparative advantage in that industry and thereby decreasing comparative advantage in its predecessor. A typical time-path of a country is outlined below.

![Figure 5: Flying Geese Pattern of Economic Development, by Industry](image)

In the international, and particularly East Asian, context, the same Flying Geese model has been extended to outline how industries relocate from more advanced countries to developing countries. In East Asia, these international industrial linkages may be via processes like Foreign Direct Investment. Kwan (2001) outlines the textile industry as a typical example of such industrial relocation, which has occurred as outlined in Figure 6. The effect of this industrial relocation can be that of a supply chain network over East Asia, where different
countries have comparative advantages in different segments of the production process. This is what gave rise to the possibility of an international integrated supply chain for the textile and clothing industry.

**Figure 6: Flying Geese Pattern of Economic Development, by Country**

It is however possible that the current situation of the textile industry is not so well-represented by Kwan’s stark division between China and Vietnam and India (and the rest of the poorer ASEAN countries) due to the sheer size and disparate levels of development within China. Here, comparative advantage should be distinguished from absolute advantage. China has developed capabilities in slightly more capital-intensive industries, but still retains a large degree of absolute advantage in textile and apparel industry due to its large pool of labor. There thus exists the concern that China’s capabilities in many different sectors are disrupting this path of development. Kwan (2002) outlines this as the worry of many Japanese economists.

As such, the textile and clothing industry does have a large role to play in economic development, especially in East Asia. If China’s rising dominance in textile and clothing exports
hampers ASEAN countries, especially the poorer members, from developing their industries, it is possible that the poorer members will no longer be able to ascend the technological chain via the aforementioned backward and forward linkages in the Flying Geese model. With the end of the MFA on Jan 1, 2005, China seems set to realize this dominance in the major import markets for textiles and clothing, thus a clear and present worry. To further flesh out this potential hurdle for economic growth in the small ASEAN economies and assess the differential impacts on the different ASEAN economies, we go on to provide a breakdown of the textile and clothing industry exports structure in these countries vis-à-vis China.

4.2. The Textile and Clothing industry in China and ASEAN

We now turn to examining the place of the textile and clothing industry in China and ASEAN. In line with the supply chain division in chapter 1, we define these sub-sectors as (1) Natural fibers, (2) Manmade fibers, (3) Yarns, (4) Fabrics, and (5) Clothing. As is clear from Table 3, the textile and clothing industry is of varying importance across China and the ASEAN countries. The ASEAN countries run the whole gamut, from the textile and clothing industry making up 1.75% of exports in Singapore to 69.35% of Cambodian exports. Nevertheless, the textile and clothing industry make up less than 5% of exports in Singapore and Malaysia, 5-12% in Thailand, the Philippines, and Brunei, and Indonesia. Vietnam and Myanmar then see the textile and clothing industry making up about 18% of exports. Other authors also estimate that textiles and clothing make up about 29% of Laos’ export industry (Ushiyama, 2005). These figures are mostly in line with each country’s relative state of industrialization, with Singapore, Malaysia and Thailand being the most industrialized, followed by the Philippines and Indonesia, then Vietnam, then Cambodia, Laos, and Myanmar. Brunei, again, is an anomaly with the strong
presence of oil and other chemical products in its exports. This what one might expect with the Flying Geese model of Development. The large percentage of exports dedicated to textiles and clothing in the poorer ASEAN economies make them vulnerable to competition from China.

<table>
<thead>
<tr>
<th>Fibers</th>
<th>CHN</th>
<th>SGP</th>
<th>MYS</th>
<th>THL</th>
<th>IDN</th>
<th>PHL</th>
<th>BRN*</th>
<th>MMR*</th>
<th>VNM*</th>
<th>KHM*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Fibers</td>
<td>11.40%</td>
<td>3.85%</td>
<td>7.89%</td>
<td>9.51%</td>
<td>10.40%</td>
<td>1.60%</td>
<td>0.29%</td>
<td>0.00%</td>
<td>0.48%</td>
<td>0.02%</td>
</tr>
<tr>
<td>Manmade Fibers</td>
<td>8.91%</td>
<td>13.66%</td>
<td>29.29%</td>
<td>20.92%</td>
<td>26.63%</td>
<td>3.27%</td>
<td>0.10%</td>
<td>0.19%</td>
<td>0.10%</td>
<td>1.05%</td>
</tr>
<tr>
<td>Yarns</td>
<td>1.36%</td>
<td>1.22%</td>
<td>2.17%</td>
<td>3.19%</td>
<td>0.73%</td>
<td>2.36%</td>
<td>0.00%</td>
<td>0.85%</td>
<td>4.20%</td>
<td>0.04%</td>
</tr>
<tr>
<td>Fabrics / other final textiles</td>
<td>15.95%</td>
<td>10.48%</td>
<td>9.93%</td>
<td>11.28%</td>
<td>5.76%</td>
<td>4.33%</td>
<td>0.97%</td>
<td>0.00%</td>
<td>9.40%</td>
<td>0.20%</td>
</tr>
<tr>
<td>Clothing</td>
<td>62.39%</td>
<td>70.79%</td>
<td>50.72%</td>
<td>55.12%</td>
<td>56.48%</td>
<td>88.44%</td>
<td>98.63%</td>
<td>98.95%</td>
<td>85.82%</td>
<td>98.70%</td>
</tr>
<tr>
<td>T&amp;C</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>T&amp;C as % of total exports</td>
<td>16.74%</td>
<td>1.75%</td>
<td>2.07%</td>
<td>6.89%</td>
<td>11.55%</td>
<td>6.90%</td>
<td>5.34%</td>
<td>18.13%</td>
<td>18.40%</td>
<td>69.35%</td>
</tr>
</tbody>
</table>

Source: UN Comtrade database, ASEAN Secretariat. Laotian data is unavailable.

The countries also differ in the industrial breakdown of the textile and clothing industry.

This is clear also in table 3 as in figure 7, which is constructed from the data in table 4.

**Figure 7: Structure of Textile and Clothing Export Industry in China and ASEAN, 2003**

Source: UN Comtrade database, ASEAN Secretariat. Laotian data is unavailable.

---

A listing of the abbreviations used can be found in Appendix I.
In Myanmar, Cambodia, and Brunei, clothing and other final articles (stage 4) make up 98% of textile and clothing exports. This is followed by 85-90% in the Philippines and Vietnam, with these countries having 8-10% of their textile and clothing exports devoted to fabrics (stage 3). Singapore, Malaysia, Thailand, and Indonesia then still have the vast majority of the textile and clothing exports devoted to stage 4 articles, but a sizeable portion at stage 1, due to the strength of the manmade fibers produced by their chemical industries. Fabrics also make up 8-10% of textile and clothing exports in Singapore, Malaysia and Thailand, and Vietnam, and a lesser portion of 5% for Indonesia and the Philippines. These figures are again consistent with the Flying Geese theory that the less developed ASEAN countries should primarily produce final articles, and the more industrialized countries, products that are less labor-intensive and more capital-intensive.

Figure 7 and Table 4 also show that the majority of China’s textile and clothing exports are concentrated in stages 3 and 4. The sizeable portion at stage 1 is due to China’s export of silk as a primary agricultural commodity. The structure of China’s textile and clothing exports thus seems to be similar to that of the ASEAN-5 countries, sans the Philippines. 63% of them are concentrated in the clothing sub-sector. Given the Flying Geese model of development as explicated above, it seems that Vietnam’s position as laid out by Kwan (2002) is perhaps even a step ahead of the least developed ASEAN countries of Cambodia, Myanmar, and Laos—Vietnam at least exports some fabric. The textile and clothing industry is thus all the more important for these latter countries’ development.

Table 3 also indicates that China and the ASEAN countries seem to be heavily concentrated in the final stage of the supply chain. However, the ASEAN countries that are producers of manmade fibers may stand to benefit from exports to China. All ASEAN countries
may also benefit from intermediate product imports, such as natural fibers and fabrics, from
China. The next step is to analyze the extent to which complementarities or competitions exist
between China and ASEAN.

Such complementarities and competitions are reflected in trade specialization indices. In
each sub-sector, an index of each country’s specialization is constructed, by finding \((EX - IM) / (EX + IM)\). This indicates the extent to which a country engages in inter-industry trade in that
particular sub-sector. For illustration purposes only, we look at how this index can be used to
analyze trade in the clothing sector between China and Thailand. If Thailand is a strong net
exporter of clothing (i.e. the index is close to 1) and China is also a strong net exporter of
clothing, the two countries are competing in the sector. If on the other hand, China is a strong net
importer of clothing (i.e. specialization index is close to −1) it is not competing in the sector, and
is even potentially contributing as a consumer of Thailand’s clothing exports; there thus exist
complementarities between the two countries. If China engages in much intra-industry trade (i.e.
specialization index is close to 0), the effect on Thailand is somewhere in between, as it is both a
competitor for Thailand’s clothing exports, as well as consumer of those same exports.

| Table 5: Specialization indices in the Textiles and Apparel in China and ASEAN, 2002 |
|---------------------------|-----------|-----------|--------|--------|--------|--------|--------|--------|--------|
|                           | CHN       | SGP       | MYS     | THL    | IDN    | PHL    | BRN    | MMR    | VNM    | KHM    |
| Natural fibers            | 0.123     | -0.235    | -0.249  | -0.312 | -0.164 | -0.838 | -0.658 | -1.000 | -0.794 | -0.983 |
| Manmade fibers            | -0.122    | 0.117     | 0.317   | 0.229  | 0.580  | -0.679 | -0.943 | -0.993 | -0.950 | -0.927 |
| Yarns                     | 0.060     | -0.381    | -0.220  | 0.158  | -0.170 | 0.318  | -0.983 | -0.567 | -0.358 | -0.950 |
| Fabrics                   | 0.445     | -0.333    | -0.343  | 0.026  | 0.193  | -0.539 | -0.640 | -1.000 | -0.719 | -0.905 |
| Clothing / final articles | 0.932     | -0.038    | 0.767   | 0.923  | 0.986  | 0.956  | 0.754  | 0.964  | 0.777  | 0.938  |
| Overall                   | 0.546     | -0.081    | 0.268   | 0.388  | 0.581  | 0.350  | 0.194  | 0.090  | 0.074  | 0.294  |

Source: UN Comtrade database, ASEAN Secretariat. Laotian data is unavailable.
Generally, Table 5 indicates that the ASEAN countries seem to be well-integrated into the international supply chain. The specialization indices for individual sub-sectors often indicate strong specialization in either direction, and in particular the specialization index for the dominant clothing sub-sector is close to 1 for almost all the countries except Singapore. However, the specialization index for the sector as a whole is low for most countries. Myanmar and Vietnam, in particular, import almost as much in intermediate inputs for clothing production as they produce clothes. The only exception, with a specialization index with a magnitude of more than 0.5, is Indonesia. This indicates that the countries are importers of the intermediate inputs that are used to produce clothing. The specialization index for China, on the other hand, is quite high, at 0.546.

Nordas (2004) also finds evidence vertical integration within China. The paper uses methodology of Hummels et al. (2001) who define an index of the proportion of imported intermediate inputs in output as:

\[
\text{Share of imported intermediates} = \frac{\text{Imported intermediate inputs}}{\text{Total final output}}
\]

Using 1997 input-output tables from China in the GTAP database, Nordas (2004) finds this share of imported intermediates to be only 8.1% for textiles produced by China, and 5.7% for clothing. We calculate similar indices for the ASEAN countries. However, some ASEAN countries lack input-output tables, and the most recent for other countries are from the early 1990s. We thus approximate these values by constructing this index for the collective textile and clothing sector. We assume that all imported intermediate inputs (everything except clothing) are used to manufacture both fabrics and clothing; they are not used for consumption. This is a reasonable assumption for this sector, given the supply chain analysis given earlier. However, we also
assume that some domestic fabric production is used as final output, and some to manufacture clothing. To take this into account without double-counting fabrics that are used in clothing manufacture, total final output is defined here as:

\[
\text{Total final output} = \text{Domestic output value of fabrics} + \text{Import value of fabrics} + \text{Domestic value-added of clothing}
\]

The second term, the import value of fabrics, is added to account for the domestic output of clothing that has imported fabrics as intermediate inputs. When industrial production statistics are unavailable, the export value of both fabrics and clothing is used to proxy total final output. For small countries that manufacture primarily for export purposes, this lower-bound value is likely to be a good approximation of the total final output. The value share computed from such approximations is thus a close upper bound.

**Figure 8: Output shares of Imported Intermediate Inputs, 2002**

Sources: UN Comtrade database, ASEAN Secretariat, Various yearbooks of industrial statistics, IMF International Financial Statistics. Author's calculations.

* 2000 data
** 2001 data
.^ Export values used to proxy industrial production

---

While these numbers are approximations and therefore should be interpreted with caution, the share of imported intermediate in China’s production is the lowest in the countries above, at 18%. This is in stark contrast to most of the ASEAN countries. Other than Thailand, imported intermediates make up at least 40% of their industrial output in the textile and clothing sector. This is in line with the observation made by Nordas (2004) that though many smaller countries rely on the international supply chain, the supply chain in China is largely internal due to its sheer size. Such a result implies that there lies little scope for ASEAN to hitch on to the ride if China dominates world textile and clothing markets.

There might, however, be scope for the ASEAN countries to benefit from intermediate imports from China, and this is incorporated into this study. Kwan (2001) points out that an investigation of competition and complementarities in the holistic textiles and clothing sector between China and the ASEAN countries needs to take into account the nuances of the different sectors. For instance, assume for illustration purposes that the clothing and fabrics sub-sectors are of equal size in China and Singapore. If China’s specialization index in clothing is 1 and fabrics is –1, and Singapore’s is –1 and 1 respectively, aggregating the two sectors will yield figures indicating neither strong competition nor strong complementarity. However, the two countries see perfect complementarities in each sub-sector. As such, Kwan (2001) looks at the correlations of these specialization indices for different sectors across all exports. We conduct a similar exercise.

However, the sub-sectors are of different size. Since we seek an indicator of the extent to which China competes with each country and the subsequent impact on the country, and so we use the country’s trade structure as a basis for comparison. Thus, for each ASEAN country, the sub-sector specialization index is weighted by the weight that that particular sub-sector takes in
total textile and clothing-sector trade. The same weight is applied to China’s sub-sector specialization index. This is useful for weighting each observation by its relative importance for each ASEAN country. With these constructed variables, we analyze competition and complementarities in the textile and clothing sector via weighted correlations, calculating:

\[
corr_{i,China} \left[ \frac{(EX + IM)_{i,sub}}{(EX + IM)_{i,Total}} , \frac{(EX - IM)_{i,sub}}{(EX + IM)_{i,Total}} \right] \cdot \left[ \frac{(EX + IM)_{China,sub}}{(EX + IM)_{China,Total}} \right]
\]

for each country \( i \), and \( sub = 1 \) to 5, for each of the representative sub-sectors.

**Figure 9: Weighted Correlation of Textile & Apparel sector with China, 2002**

Source: ASEAN Secretariat, UN Comtrade database. Laotian data unavailable. Author’s calculations.

As in Kwan’s study, we find that other than Singapore, the countries are in competition with China. There is a loose trend that we can draw, as shown by the dotted line in Figure 7 above—complementarity with China changes to competition as one moves from Singapore to Thailand, then the trend reverses once upon reaching Indonesia and Vietnam. This is again consistent with the Flying Geese theory in figure 5, with Singapore two cycles ahead of China and thus with complementarities in production and consumption. However, the rest of the
ASEAN-5 countries, as well as Vietnam, are on adjacent cycles. The two outliers to this trend are Myanmar and Cambodia. However, the high direct competition correlations for these two countries are because they are net importers of manmade fibers instead of fabrics. Their supply chains thus mesh well with the trade structure of ASEAN-5 countries (with chemical industries that make them strong net exporters of manmade fibers), but not so well with that of China.

The high positive correlations for all the ASEAN countries save Singapore also support a hypothesis that there is much overlap with China; China may be leapfrogging the Flying Geese cycles due to her industrial development and capital investment, as well as spreading herself over the labor-intensive end of the spectrum due to her large supply of cheap labor. This leapfrogging, nevertheless, is for the moment restricted to the countries one cycle ahead of China.

Indeed, the taking from this exercise is that in general, correlations are high between the ASEAN countries and China, indicating a trade relationship with much competition and little complementarities. This is due to the interaction of two reasons. First, Figure 7 pointed out the large weight of final-stage clothing exports in total textile and clothing exports for the ASEAN countries. This brings the ASEAN countries into direct competition with China in this sub-sector which China looks set to dominate. Second, earlier discussion established that China is not well-integrated into the international supply chain, and uses internal sourcing for much of the intermediate inputs for its clothing output. This reduces potential for complementarity with China as it implies the ASEAN countries mesh through China primarily through importing China’s exports, not through exports to China. The only sub-sector with potential for exports to China seems to be manmade fibers, and even that, only marginally so. These complementarities in imports from China, when they exist, do not outweigh the direct competitive effects in the countries’ exports.
Like many small producers of textiles and clothing, the ASEAN countries have till now been protected from direct competition with China via the MFA and ATC. With the end of the quota regime, they will be exposed to this competition, and this is especially worrying for the poorer countries, especially Cambodia and Laos, which have export industries heavily reliant on clothing manufacturing.

4.3. Competitive Issues for the ASEAN countries

The economic outlook for the ASEAN countries thus looks rather bleak as they are thrown into direct competition with the sleeping dragon of China. However, being in competition with China is one thing, and being competitive with China is another. Regrettably, the results are not much different. Many of the ASEAN countries worry that they are unable to compete with China based on pure production and transportation costs. Wage rates in the Philippines, Thailand, and Malaysia are high, and uncompetitive with China. Shipping times to the US west coast also average 45 days, compared with 12 to 18 for China (USITC, 2004). Cambodian wage rates, though comparable with China’s, are coupled with lower labor productivity—Cambodia’s labor cost to value added ratio is very high compared to China (World Bank, 2004).

Coupled with this, one sees political and social unrest, and similar problems of corruption in several ASEAN countries. This has the potential to disrupt production in Indonesia and the Philippines (USITC, 2004). Vietnam and the Philippines were ranked 102nd in the world in Transparency International’s Corruption Perceptions Index, and Indonesian 133rd (Transparency International, 2004). It is also acute for unranked Cambodia, the ASEAN country most reliant on clothing exports. At a February 2005 conference, James Wolfensohn, the president of the World Bank, put anti-corruption measures at the top of Cambodia’s priorities; businessmen also
estimate that payoffs to government officials add 15% to business costs (The Economist, Feb 19, 2005). The bribery costs imposed by corruption are especially high in import and export activities, which are important to the clothing-manufacturing sector there. These costs moreover dwarf labor costs, which make up just 15% of a typical order of 5-button denim jeans (World Bank, 2004).

Laos and Vietnam furthermore face some legal barriers that will hamper their ability to benefit from quota abolition. These primarily stem from their lack of WTO membership. The quota phaseout applies only to WTO members. Quotas on textiles and clothing can still be applied to these two countries, putting them at a disadvantage relative to other textile and clothing exporters that are WTO members.

These two countries moreover face further difficulties in penetrating the US market. For Laos, this is despite President Bush’s signing of the US-Laos Bilateral Trade Agreement in December 2004, giving Laos Normalized Trade Relationship (NTR) status and thus MFN tariff concessions. This should greatly help increase Laos’ cost competitiveness in the US market, since the non-MFN rates were around 45%, while the new MFN rates are around 12.5%. However, this agreement explicitly excluded discussing quotas on trade in textile and clothing products, which are yet to be negotiated in a US-Laos Agreement on Garment and Textiles. Moreover, the agreement stated that safeguard quota provisions may be imposed indiscriminately on textile and clothing imports from Laos. (Mekong Capital, 2003). Vietnam, too, remains subject to an agreement—the Vietnam-US Garment and Textile Agreement. This was signed in 2003, and is automatically renewed on a yearly basis unless renegotiated. It categorizes Vietnamese export quotas into 25 categories, each of which is subject to 7% growth per year, except that on wool products which grows at 2% per year.
The EU market poses fewer problems to these countries. The EU’s Generalized System of Preferences (GSP) schemes give developing countries preferential access. Vietnam, Cambodia, and Laos benefit from the general GSP scheme. Their textiles and clothing exports get a 20% tariff reduction from the EU’s MFN rate, giving them a competitive advantage over countries not under any GSP program. On top of this, the Everything But Arms (EBA) program targeted at 50 least developed countries covers almost all import items that are subject to tariffs, including textiles and clothing. Within ASEAN, Laos and Cambodia are beneficiaries of this program. Under the EBA, as long as countries meet Rules of Origin (ROO) requirements that there is a manufacturing “double jump” (i.e. from stage 2 (yarn) to stage 3 (fabrics) to stage 4 (clothing)) in a country, they can export tariff-free products to the EU. The ROO requirement is also open to the concept of Regional Cumulation, which is aimed at fostering regional economic integration. ASEAN, sans Myanmar, is one of the three regions under this scheme. Under this scheme, clothing can be manufactured with non-Laotian inputs and still considered as Laotian in origin. With the lack of substantial fabric manufacturing industries in Laos and Cambodia, the two countries were given a special provision that allowed them to have just a “single jump” (i.e. from fabrics to clothing) in their own country, as long as the inputs qualified for regional cumulation from ASEAN sans Myanmar (Mekong Capital, 2003). Mekong Capital (2003) furthermore note that Laos has taken advantage of this provision, with 57.6% of its 2001 clothing exports to the EU given EBA tariff-free access; this further ameliorates Laos’ lack of WTO membership.

6 “Arms” here refers to firearms and ammunition.
4.4. Trends in ASEAN exports to major markets

This chapter has thus far provided a snapshot of some economic and legal issues surrounding the textile and clothing trade for China and ASEAN. Even though the ASEAN countries are well-integrated into an international supply chain, they are unable to benefit from a symbiotic supply-chain relationship with China. Having a competitive relationship with China, with the abolishment of quotas on clothing and textiles, they are likely to be losers from China’s increased presence in global textile and clothing trade. Laos and Vietnam, without WTO membership, will see their competitiveness further hampered. The question then arises as to how they might weather this storm. Chapter 2 found that most of the ASEAN countries also see some binding quotas (though these are by no means as restrictive as that on China), and that the lifting of these quotas will help go some way towards boosting clothing exports through the elimination of the export tax equivalent.

As an indication of how the ASEAN countries might weather the storm, we now compare and contrast the export trends of the ASEAN countries in major import markets along the lines of James’ (2003) method of comparing quota to non-quota markets to project what might happen when quotas are lifted. Since the high correlation result was driven primarily by the high weight of clothing in the relevant trade of many of the ASEAN countries, we compare exports in the final-stage clothing sector. One caveat here is that the large majority of ASEAN clothing exports are destined for US and EU markets, not the Japanese market as the Japanese market is much smaller. In 2003, Japan absorbed just 8.4% of world clothing imports, as opposed to 29.9% for the US. The figures are relegated to Appendix III for space reasons. The y-axes are plotted in the
base 10 logarithms of US dollars. This gives a linear representation of geometric growth. The scales are also the same for all import markets to facilitate comparison.

For the ASEAN-5 countries, there is a quite distinct progression from the US, considered the most quota-binding import market, to the less-binding EU, to the quota-free Japan. With the exception of Singapore, all the ASEAN-5 countries see their clothing exports rise over time in the US market. This rate of increase is comparable to that of China’s. The EU import market, however, sees no clear relationship. Singapore’s and Malaysia’s exports are dropping, while that of Thailand and Indonesia are increasing slightly. Finally, after 1994 or 1995, there is a clear downward trend in the Japanese import market. This suggests that it is a manifestation of the aforementioned quota-hopping effect—the more binding the quotas on China, the more export growth (or less export shrinkage) is induced in the smaller economies. The lifting of quotas could plausibly reverse the upward trend for ASEAN-5 clothing exports in the US import market, and create downward trends in both the US and EU markets similar to that in the Japanese market.

There is a slightly different story for the other ASEAN economies, though they start out from a much lower base. With the exception of Laos, the same general upward trend in the US import market appears. This could be due both to the quota-hopping effect, and general freeing of quotas and restrictions on the countries in question. Cambodian clothing exports skyrocketed after the country was granted MFN status in 1996, as did Vietnam’s later. Cambodian and Vietnamese quotas in the US market, too, have seen growth in recent years. The Vietnam-US agreement was outlined earlier. The 1999 US-Cambodia Trade Agreement on Textile and Apparel was even more generous. It gave Cambodia a potential annual 18% increase in export quotas as long as it demonstrated compliance with international labor standards. Myanmar’s clothing exports to the US took a drastic fall after 2000, but this is more due to pressure to stop
Myanmar due to human rights violations in the country. In 2003, the US imposed trade sanctions against Myanmar, stripping it of access to the US market.

The trend for the EU market seems similar to that in the US market, just that now Laos has a very slight upward trend probably due to favorable duties and quota-free access under the EBA program, and Vietnam is instead quite stagnant. This hints again at quota hopping in the case of some countries, and perhaps binding quotas for Vietnam.

Finally, we look at the trends for Japan. These, surprisingly, are still trending upwards for the poorer ASEAN economies and are even growing faster than China; Vietnam is the only exception. However, the curve for Vietnam seems similar to the curve for China in growth trend; it does not display a clear downward trend, quite unlike that for the ASEAN-5 economies. This suggests that at least for Japan, there exist for these countries some factors, quite separate from the quota-hopping effect, that are causing clothing export growth even when in competition with China.
5. Estimating the impact

5.1. Reviewing the Armington model

With the previous trends in mind, we now introduce a model through which one can model the comparative static effect of quota imposition to both estimate the effect of quota abolition, as well as test the previous hypotheses and find the magnitude of time trends in the data. As in the GTAP simulations, we use the Armington (1969) model of constant-elasticity-of-substitution (CES) import demand. In this model a country’s import demand is described with a matrix of two dimensions: first, that of types of goods (e.g. cars, clothing), and second, that of a particular good’s country of production. In the latter case, clothing produced in China is differentiated from clothing produced in Thailand. The utility from clothing-in-general is derived as a composite utility from clothing produced in different countries. Armington (1969) furthermore assumes that the marginal rates of substitution between two products in any one market are independent of purchases in other markets. The consumer therefore performs two optimizations: first, he maximizes utility from the various classes of goods, subject to their (given) price levels. Second, he minimizes cost within each class of goods by substituting between those produced by different countries.

To simplify the model, Armington (1969) then introduces two more assumptions. First, that the elasticity of substitution between any two products is constant, and second, that this elasticity of substitution between any two products competing in the same market is the same. With these assumptions, the utility function \( X = \phi(X_1, X_2, \ldots, X_n) \) is a CES function, with the following form, where \( X_1, X_2, \ldots, X_n \) represent \( n \) different countries’ products. The CES is represented by \( \sigma \), and \( \beta_i \) is a constant specific to country \( i \), reflecting the preference for obtaining imports from country \( i \). Using the standard form for CES utility functions, this gives
\[ X = \phi(X_1, X_2, X_3, \ldots X_n) = \left[ \sum_{i=1}^{n} \beta_i X_i^{\sigma} \right]^{\frac{\sigma}{\sigma-1}} \]

where 0 < \( \sigma < \infty \). As \( \sigma < 1 \) and \( \sigma \to 0 \), the goods become perfect complements. As \( \sigma > 1 \) and \( \sigma \to \infty \), the goods become perfect substitutes. At \( \sigma = 1 \), the CES utility function becomes a Cobb-Douglas utility function, with a fixed amount spent on imports from each country.

From the first order conditions, one can obtain:

\[
P = \frac{P_i^{\frac{1}{1-\sigma}}}{\beta_i X_i^{\sigma} X^{\frac{1}{\sigma}}} \Leftrightarrow X_i = \beta_i^{\sigma} X \left( \frac{P_i}{P} \right)^{-\sigma}
\]

which defines a demand function for country \( i \), given the total demand \( X \) (pre-determined in the prior multi-good utility-maximization problem) and the price level of \( i \)'s exports \( P_i \) relative to the overall price level \( P \). The proof for this is in Appendix IV. This may also be expressed as:

\[
P_i X_i = \beta_i^{\sigma} P X \left( \frac{P_i}{P} \right)^{1-\sigma}
\]

With such a demand function, binding quotas on any country’s imports impose a ceiling on the possible values of \( X_i \), shifting the country \( i \)'s current position on its demand curve to reflect this, with lower \( X_i \) and higher \( P_i \). However, this now affects the overall price level, increasing it. This shifts the demand curves of the other countries, bringing the entire import market to a new general equilibrium. Nevertheless, in the new general equilibrium, the original first order conditions are still satisfied.

By totally differentiating equation (3), Armington (1969) further derives the following relationship, where each country’s export growth is a function of growth of expenditure in
clothing-in-general\(^7\), \(d(PX) / PX\) and price changes throughout the market. The proof for this equation is also reproduced in Appendix IV.

\[
\frac{d(P_i X_i)}{P_i X_i} = \frac{d(PX)}{PX} - (\sigma - 1)(1 - S_i) \left( \frac{dP_i}{P_i} \right) + (\sigma - 1) \sum_{j=1}^{n} \left( S_j \cdot \frac{dP_j}{P_j} \right)
\]

where \(S_i\) is the market value share of the import market, for country \(i\).

This equation also implies that

\[
\frac{d(P_i X_i)}{P_i X_i} - \frac{d(P_{\text{China}} X_{\text{China}})}{P_{\text{China}} X_{\text{China}}} = (\sigma - 1) \left( \frac{dP_{\text{China}}}{P_{\text{China}}} - \frac{dP_i}{P_i} \right)
\]

and that relative changes in export value are a function of relative price changes.

5.2. Applying the Armington model to quotas on textiles and clothing

How then may Armington’s model of import demand be applied to quotas applied discriminately on exporters? Earlier in this essay, we outlined the general impact of quotas on a country’s exports, using a single-exporter and single-importer model. Martin et al. (2004) show this may be further developed to include countries that have different degrees of quota restrictions, as well as those that do not, by applying the Armington CES function to the quota problem. As in that paper, we briefly outline how quotas applied to some countries, and not to others, distort the market.

Martin et al. (2004) view each quota as having a shadow price with the existence of quota markets, assuming that these markets are efficient. As mentioned earlier, these markets may be

\(^7\) Growth of expenditure on clothing-in-general is then a function of the growth in aggregate demand, and of changes in the price level of clothing-in-general as well as that of other goods. Armington (1969) notes that one can assume the own-price elasticity of demand for clothing-in-general to be unity (as might be the case with a Cobb-Douglas utility function across classes of goods) and the cross-price elasticities of demand with respect to other classes of goods to be close to zero and therefore negligible; it therefore depends only on the income elasticity of demand.
formal or informal, and traders in these quota markets act as arbitrageurs to ensure that the quotas are allocated shadow prices that adequately reflect their export tax equivalent—this shadow price can be viewed as a bilateral tax on the imported good, with the new cost faced by the exporter being his original cost plus the cost of the quota. In figure 10, this raises his cost, resulting in a downward shift in the demand curve he faces, from $X_{i0}$ to $X_{i1}$\textsuperscript{8}. Quotas on his competitors, on the other hand, raise their prices and make his own goods relatively more attractive. Since the two goods are imperfect substitutes, the demand curve our exporter faces shifts outward from $X_{i1}$ to $X_{i2}$.

Equation (4) helps aid this explanation. Own-export quotas have the effect of making $dP_i/P_i$ positive, lowering export value in the case that the goods are substitutes ($\sigma > 1$).

Likewise, other-country quotas make $dP_j/P_j$ positive, $j \neq i$. This raises country $i$'s export value. The quota impact on each individual country is influenced in part by the relative restrictiveness of quotas imposed on itself, and those on its competitor countries. This restrictiveness may be measured by the size of each $dP_i/P_i$ induced by quotas on each country.

**Figure 10: Impact of quotas on import demand for country $i$**

\textsuperscript{8} This may also be represented in an upward shift in his supply curve to reflect reduced supply.
With this framework, Martin et al. (2004) assume that quota barriers are effectively measured by the export tax equivalents and the effect they have on import demand. During the MFA and over the course of the ATC, the export tax equivalents of the quotas on China affected the demand curves faced by other countries by shifting them outward, reflecting the effect of inducing more outsourcing to those countries.

To further illustrate this point, in this case, $X_{i2}$ is below $X_{i0}$. This reflects that the negative demand effect of quotas on country $i$ is greater than the positive demand effect of quotas on all other countries. This is not necessarily the case for all countries—it is just as plausible that the converse is true and that $X_{i2}$ is above $X_{i0}$. It could, for instance, be hypothesized that for the small clothing-producing countries, the quotas on China had a stronger positive effect than the negative effect of quotas on their own production. For China, on the other hand, the quotas on other countries had a smaller effect than quotas on China’s production. The eventual combined effect depends on the substitutability of the two countries’ exports, which is reflected by $\sigma$ in the earlier CES function, and on each country’s market share.

In Martin et al’s (2004) formulation, as in many studies dealing with Armington elasticities, prices are exogenous. To use this assumption, we assume a constant returns-to-scale cost function in each country in each time period. This infinitely-elastic supply function first allows one to take the prices $P_i$ of the non-quota countries to be their supply function. For the quota-restricted countries, the prices $P_i$ may also be taken to be independent variables, taking each quota’s export tax equivalent as representative of an additional tariff imposed on the country, that is incorporated into the price reported. Other tariffs are also included in this price variable. This is consistent with the aforementioned illustration of the effects of quotas on the import market. This view is also corroborated by Figure 3, where China’s price level compared
to that of the rest of the world, which started to drop in the late 1990s, during the MFA phaseout over the course of the ATC. These assumptions allow one to assume that prices adequately reflect the effect of quotas; the quota-hopping effects should be fully accounted for. When quotas on China are abolished, one can thus, with estimates of $\sigma$ and through equation (4), estimate the partial equilibrium effects on the import demand functions for other exporters by Armington’s (1969) methodology.

5.3. Describing the Panel data

Before delving into the specific model formulation proper, we provide a brief sketch of the data used to estimate the model. The data was obtained from an OECD online database, <http://new.sourceoecd.org>, and covers the import data of three developed countries— the United States, the European Union, and Japan. ASEAN, China, and Hong Kong exports to each country were obtained.

The data consists of annual data from 1991-2003 (1995-2003 for the EU), and is taken from the SITC Revision 2 category 84, titled “Articles of apparel and clothing accessories”. As indicated in Appendix II, this is adequate to reflect the final stage of the textile and clothing supply chain. Aggregating all clothing into one category assumes that each country produces the same clothing basket, which is probably not true. However, this is done for the sake of simplicity. We depart from the prior use of the Harmonized System 1996 classifications because the SITC Revision 2 data available for the taking is much more comprehensive than the HS 1996 data. This period is chosen because it is hypothesized that the industrial development paths of the poorer ASEAN countries in this data set are likely to be well-reflected in the data. Also, China’s rise in the textile and clothing industry may not be well-reflected prior to this period.
The specific classes of data obtained from the OECD website are about both import value, as well as import quantities. Data on imports from the individual ASEAN countries is taken straight from the database, but data on imports from China are obtained by adding the data on Mainland China and Hong Kong, in effect treating Hong Kong manufactures as Chinese manufactures. This is to eliminate the effect of the re-exports from Mainland China that are channeled through Hong Kong, and is justified because Hong Kong’s manufacturing industry has declined greatly in recent years. Though these re-exports have diminished in recent years with China shipping goods directly to the industrialized countries, they are still significant enough to warrant some method of accounting for them.

Price levels for each country’s clothing exports are obtained by dividing import value for each country by import quantities. This is the same methodology as that used by Evans and Harrigan (2004). Import value for all three countries is given in thousands of US dollars. Import quantities for the US is given in tons, while that for the EU and Japan are given in thousands of units. These disparate units in the data do not matter for the purpose of estimation and data analysis as the regressions are run with data on unit-free ratios instead of absolute values. Also, with the assumption of constant returns to scale, we analyze each major country’s import market separately. Therefore, no quantity or price data from one country’s data set is compared directly to that of another country, except through the regression coefficients they yield.

5.4. Regression Specification

Since the order conditions are the same in every period, we derive a practical form from the equation. In order to run regressions, one has to make several assumptions. First, we use Armington’s assumption that the CES remains constant over time, so that we can use time series
data to obtain meaningful regressions and estimate the value of $\sigma$. This value is important, as with estimates of the export tax equivalents of the ATC regime, we can then make projections as to what will happen to the various countries after the end of the ATC.

Also, the constant returns-to-scale function allows me to assume that each country’s decision to export goods to a specific export market is independent of its decisions to export goods to other export markets. We can thus separate the import markets of the major industrial countries, and run separate regressions for each of these import markets.

With these assumptions in mind, and since countries are more concerned about their export value than export quantity, we take the natural logarithms on both sides of the first-order-condition equations in equation (2) and obtain:

$$\ln\left(\frac{X_i}{X_j}\right) = \sigma \cdot \ln\left(\frac{\beta_i}{\beta_j}\right) + \sigma \cdot \ln\left(\frac{P_j}{P_i}\right)$$

The logarithmic form is now manageable with the aforementioned assumptions that prices are exogenous variables, and that import quantities (both with and without quotas) are endogenous variables determined by these prices. With this form, we let $j = \text{China}$, and run a panel data regression in which we combine data from the 10 ASEAN countries and one other dataset to represent the rest of the world, using ten dummy variables $\gamma_k$, $k = 1$ to 10, to account for fixed effects for 10 of these countries or regions. We thus arrive at the following functional form. This helps first to control for the Armington assumption of a constant elasticity of substitution.

$$\ln\left(\frac{X_i}{X_{\text{China}}}\right) = \text{constant} + \gamma_k \times \text{country dummies} + \sigma \cdot \ln\left(\frac{P_{\text{China}}}{P_i}\right)$$

— Regression I

Where constant $= \sigma \cdot \ln\left(\frac{\beta_i}{\beta_{\text{China}}}\right)$
And the coefficient on each country dummy $\gamma_k = \sigma \cdot \ln \left( \frac{\beta_k}{\beta_i} \right)$

This logarithmic form, comparing exports from different countries to obtain an estimate for $\sigma$, is similar to that used by Francois and Spinanger (2004)$^9$ and Gallaway et al. (2003). Ideally, we should estimate the CES with more detailed data involving all countries in the world. However, this equation will suffice for the purposes of this paper, since we focus on the effects of China’s quota liberalization on the ASEAN countries.

This model, with the aforementioned assumptions, allows one to estimate the quota-abolishment effect that ASEAN will experience. One can, for instance, approximate the partial effect of a drop in the price of imports from China due to the abolishment of quotas, and conduct sensitivity analysis as to what values the other terms in equation (4) have to take on to negate this drop in the price of China’s exports.

However, one problem with regression I is that it does not account for the time effects that exist in panel data. In Figures 3, and 11 to 16, there appear to be trends for each country’s export value over time. Indeed, regression I returns a negative and thus impossible value of $-0.574$ for $\sigma$ in the United States market, and a value for $\sigma$, 0.007, that is close to 0 in the EU market, indicating that clothing from different countries are near-perfect complements. One possible panel analysis method of dealing with this is to add dummy variables for each year, but it seems that each country’s trend is different for each year—this points to a need for dummy interactions between country dummies and year dummies, but this would imply using as many independent variables as observations, drastically reducing the degrees of freedom. This

---

$^9$ This regression form is however less sophisticated than their version. In Francois and Spinanger (2004), they optimize a non-linear convex program by minimizing the mean squared error term over every available country pair, subject to equality constraints of the form in equation 11. Here, in this OLS formulation we only minimize this mean squared error over each country $i$ paired with China.
motivates an attempt to detrend the data to obtain an accurate estimate of the elasticity of substitution, and also to gain some information on the sign and size of the trend for each country.

The problem of time trends in economic data is well-documented, and several studies that estimate Armington elasticities have recognized this shortcoming and have sought to address it with various time-series econometric methods. For instance, Gallaway et al. (2003) use several different methods to deal with this problem when estimating Armington elasticities for the US demand for imports vs domestic production. One of these methods was to first-difference their data when one of their two series (log relative quantities or log relative prices) was found to be difference-stationary—integrated with order I(1). They thus estimate the equation:

$$
\Delta \ln \left( \frac{X_{\text{imports}}}{X_{\text{domestic-production}}} \right) = \text{constant} + \sigma \cdot \Delta \ln \left( \frac{P_{\text{imports}}}{P_{\text{domestic-production}}} \right)
$$

(7)

The constant coefficient in such a first-differenced regression of logarithmic data has the interpretation of being the dependent variable’s unexplained percentage rate of growth per unit time, independent of all explanatory regressors (Wooldridge, 2000). Therefore Gallaway et al. (2003), in first-differencing, assume an unexplained annual percentage growth for imports and domestic production. The percentage change in relative quantities of imports to domestic production for each time period is split into two components: the component explainable by changes in relative prices, and unexplained changes.

Dickey-Fuller tests are run on each country’s quantity and price dataset. It is found that the time series for most countries is either I(0) or I(1). Using the methodology used in Gallaway et al. (2003), the data is first-differenced across time for each country panel, controlling for country-specific effects, to obtain an accurate estimate of $\sigma$.

---

10 For some of the data series, Dickey-Fuller tests do not reject the null hypothesis of a unit root after first-differencing. However, we view the power of the test as being adversely affected by the very short sample periods. That most of the series are I(0) or I(1) says that most autocorrelation is accounted for.
If stochastic trends exist and relative import demands are fully explainable by the CES combined with cost competitiveness and prices, we cannot reject the null hypothesis that the intercept term is 0. On the other hand, if the relative quantities are changing over time for reasons essentially unrelated to relative prices, the stochastic trend will be statistically significant. Hence, once again letting $j = \text{China}$, and combining the data for the ten ASEAN countries and the rest of the world, we estimate the regression on first-differenced data as in Gallaway et al. (2003):

$$
\Delta \left[ \ln \left( \frac{X_i}{X_{\text{China}}} \right) \right] = \text{constant} + \gamma_k \times \text{country dummies} + \sigma \cdot \Delta \left[ \ln \left( \frac{P_{\text{China}}}{P_i} \right) \right]
$$
— Regression II

$$
\Delta \left[ \ln \left( \frac{P_i X_i}{P_{\text{China}} X_{\text{China}}} \right) \right] = \text{constant} + \gamma_k \times \text{country dummies} + (\sigma - 1) \cdot \Delta \left[ \ln \left( \frac{P_{\text{China}}}{P_i} \right) \right]
$$
— Regression III

And regression II is similar to (7), but allows for different intercepts for each country.

Hence with first-differencing, we allow for different time trends for the various ASEAN countries’ relative exports to China. Plots of the import data for the various countries indicate a log-linear trend to the model. As with many economic processes, it is more reasonable to expect export value to grow at a fixed percentage rate for reasons not related to prices. Each country also seems to have a separate trend. Hence, not controlling for these fixed effects might bias the coefficients due to a much-increased presence of serial correlation. Also note that two null hypotheses are tested. In regression II, we test the null hypothesis $H_0: \sigma = 0$, and seek to estimate $\sigma$. In regression III, on the other hand, we the null hypothesis $H_0: \sigma - 1 = 0$, or that the goods are strong enough substitutes for equation (4) to actually matter.
How then may we interpret the estimated coefficients on the base constant and the country dummies? If we define $\rho_i =$ unexplained rate of growth of $X_i$, in the model that Gallaway et al. (2003) estimate, the intercept is:

<table>
<thead>
<tr>
<th>Unexplained rate of growth of $X_{imports}$</th>
<th>Unexplained rate of growth of $X_{domestic-production}$</th>
<th>Unexplained rate of growth of $X_{domestic-production}$</th>
<th>$\rho_{imports} - \rho_{domestic-production}$</th>
</tr>
</thead>
</table>

With this interpretation, for regressions II and III,

$$\text{Intercept} = \rho_i - \rho_{China}$$

Country dummy coefficients $\gamma_k = \rho_k - \rho_i, k \neq i$

This adds a stochastic time trend to the changes in $X_i$ for each time period; that country $i$'s export value grows by $\rho_i\%$ a year after accounting for price effects. This implies that export demand (as opposed to export value) is growing by $\rho_i\%$ a year for unexplained reasons, independent of price effects and growth in expenditure on clothing-in-general. This methodology of Gallaway et al. (2003) adds another term to equation (4):

$$\frac{d(P_i X_i)}{P_i X_i} = \frac{d(PX)}{PX} + (\sigma - 1)(1 - S_i) \left( -\frac{dP_i}{P_i} \right) - (\sigma - 1) \left[ \sum_{j=1}^{n} -S_j \cdot \frac{dP_j}{P_j} \right] + \rho_i dt$$

If $\rho_i > 0 (\rho_i < 0)$, there is greater (less) leeway for avoiding a negative effect from the quota abolishment-induced effect of a price drop in imports from China. Quota effects are also still fully reflected; if $\rho_{China} > 0$, the same quotas will be considered more restrictive over time, and this will thus be reflected in the price level.

Equation (9) then implies (as in regression III),

$$\frac{d(P_i X_i)}{P_i X_i} - \frac{d(P_j X_j)}{P_j X_j} = (\sigma - 1) \left( \frac{dP_j}{P_j} - \frac{dP_i}{P_i} \right) + (\rho_i - \rho_j) dt$$

--- (10)
In the above regressions, we estimate the value of $\rho_i - \rho_{China}$. If $\rho_i - \rho_{China} > 0$, country $i$'s clothing exports to a particular import market are increasing relative to China, and $i$'s market share thus increasing relative to China, for non-price-related reasons. As such, the “non-price competitiveness” of country $i$ is increasing at a faster rate than that of China’s. This makes a statement about their relative rates of change, not about their relative levels of non-price competitiveness. $\rho_i - \rho_{China} > 0$ does not imply that country $i$ is more competitive than China, just that over time, the shortfall in competitiveness is closing. Vice versa, if $\rho_i - \rho_{China} < 0$, country $i$'s exports are decreasing relative to China for non-price reasons. Also, estimating $\rho_i - \rho_{China}$ is different from estimating $\rho_i$ directly, but still serves as an indicator of the rate of change of a country’s “non-price competitiveness” level, albeit vis-à-vis China.

5.5. Estimation results and discussion

Regression I’s results are not documented because as mentioned earlier, it ignores time trends in the data, and the results were moreover not statistically significant. The results from regressions II and III are tabled and detailed on the next few pages. The t-statistics are in parentheses below each point estimate. Each regression was run multiple times, each time rearranging the data to use a different country as the base case to obtain an estimate of each country’s fixed effect time trend with a corresponding standard error. Regression III, however, indicates that the estimate of $\sigma$ for the EU is not significantly different from 1\(^\text{11}\). This indicates that perhaps the reduced country dataset of 9 years of observations per country chosen for the EU does not allow for an accurate estimate of $\sigma$. There are moreover significant stochastic trends for some of the ASEAN countries’ exports relative to China’s exports. These are discussed in turn.

\(^{11}\text{This is nevertheless similar to the clothing elasticity estimates for the US import market done by Gallaway et al. (2003). This is discussed again later.}\)
Table 7: Estimation results, Regression II

<table>
<thead>
<tr>
<th></th>
<th>United States</th>
<th>EU-15</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observations</td>
<td>128</td>
<td>88</td>
<td>123</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.325</td>
<td>0.344</td>
<td>0.677</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.261</td>
<td>0.249</td>
<td>0.645</td>
</tr>
<tr>
<td>Estimate of $\sigma$ \ $H_0: \sigma = 0$</td>
<td>1.935** $(5.753)$</td>
<td>0.980** $(5.619)$</td>
<td>1.693** $(14.469)$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Singapore</th>
<th>Malaysia</th>
<th>Thailand</th>
<th>Indonesia</th>
<th>Philippines</th>
<th>Brunei</th>
<th>Cambodia</th>
<th>Laos</th>
<th>Myanmar</th>
<th>Vietnam</th>
<th>Rest of World</th>
</tr>
</thead>
<tbody>
<tr>
<td>stoch. trend $= \rho - \rho_{China}$</td>
<td>-0.096 $(–0.475)$</td>
<td>–0.082 $(–0.656)$</td>
<td>–0.028 $(–0.228)$</td>
<td>–0.035 $(–0.283)$</td>
<td>–0.068 $(–0.548)$</td>
<td>0.083 $(–0.663)$</td>
<td>0.201 $(1.611)$</td>
<td>0.006 $(0.051)$</td>
<td>0.276** $(2.221)$</td>
<td>–0.007 $(–0.054)$</td>
<td>0.042 $(–0.126)$</td>
</tr>
<tr>
<td></td>
<td>Singapore</td>
<td>Malaysia</td>
<td>Thailand</td>
<td>Indonesia</td>
<td>Philippines</td>
<td>Brunei</td>
<td>Cambodia</td>
<td>Laos</td>
<td>Myanmar</td>
<td>Vietnam</td>
<td>Rest of World</td>
</tr>
<tr>
<td></td>
<td>–0.150 $(–1.210)$</td>
<td>–0.082 $(–0.656)$</td>
<td>–0.028 $(–0.228)$</td>
<td>–0.147 $(–1.110)$</td>
<td>–0.086 $(–0.646)$</td>
<td>0.391** $(2.551)$</td>
<td>0.348** $(2.608)$</td>
<td>0.343** $(2.226)$</td>
<td>0.382** $(2.490)$</td>
<td>0.138 $(1.039)$</td>
<td>0.143 $(0.703)$</td>
</tr>
</tbody>
</table>

T-statistics are in parentheses
* Statistically significant at a 10% level
** Statistically significant at a 5% level

Table 8: Estimation results, Regression III

<table>
<thead>
<tr>
<th></th>
<th>United States</th>
<th>EU-15</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observations</td>
<td>128</td>
<td>88</td>
<td>123</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.230</td>
<td>0.118</td>
<td>0.358</td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>0.157</td>
<td>–0.008</td>
<td>0.294</td>
</tr>
<tr>
<td>Estimate of $[\sigma - 1]$ \ $H_0: \sigma = 1$</td>
<td>0.935** $(2.780)$</td>
<td>–0.020 $(–0.114)$</td>
<td>0.693** $(5.923)$</td>
</tr>
</tbody>
</table>

** Statistically significant at a 5% level

Estimates of the trend coefficients are not reproduced, as these are the same as in Regression II.
These estimate of $\sigma$ are very different from the import-import elasticities of 8.80 used by the GTAP simulations. However, the value for the US are more similar to the import elasticities for classes of clothing products found by Gallaway et al. (2003)—the values they find are mostly close to 1. They are displayed in Appendix V. GTAP documentation moreover points out in a description of their methodology that the value of 8.80 has been adjusted upwards from the values found by most econometric studies$^{12}$ (Dimaranan et al, 2002). In this study, we will use the values of $\sigma$ that we estimated. However, these very different estimates should be taken in light of the observation made by McDaniel and Balistreri (2002) that policy projections are extremely sensitive to estimates of Armington elasticities; different estimates produce very different results and many different studies have produced many different estimates.

With the statistically significant estimates of $\sigma$, we now follow the methodology recommended by Armington and estimate the partial effect of China’s quota abolition on the both its own exports, and those of other countries. Equation (4) indicates that all other countries’ exports are equally affected. Hence, one value is sufficient to describe the model’s predictions for the effect on other countries. In table 9, we use a 95% confidence interval for $\sigma$, and show the partial effect estimates derived from both the point estimate of $\sigma$, and the upper and lower bound for the 95% confidence interval. For the EU, only the upper 95% bound estimate is shown because the point estimate is not significantly different from 1, indicating no substitution effects.

At this point, one should also note from table 9 that the effect that the abolition of China’s quotas has on other countries’ exports is less pronounced than the effect on China’s own exports as long as China’s market share is less than 50%. For instance, China can increase its

---

$^{12}$ The GTAP simulation database fixes domestic production-import elasticities at 4.40 for Apparel based on past econometric estimates, and multiplies this by a factor of two to arrive at 8.80 for import-import elasticities. This upward adjustment is to control for a prior belief that terms of trade effects generated by trade policy changes are generally low.
market share from 20% to 30%, a jump of 50% from the 20% base. However, other countries on average see their market share shrink by 12.5%, much lower than the 50% increase for China. This shrinkage is furthermore ameliorated by the growth in the size of the import pie for the taking. If US or EU domestic production is included as one of the “countries” in the Armington model, it is instructive to observe that the tradeoff from China’s increased market presence is likewise spread out between domestic production and foreign imports. The effect on domestic imports is furthermore likely to be dampened by a lower domestic production-import elasticity of substitution, as GTAP documentation argues.

### Table 9: Partial effect of quota abolition through drop in China’s export prices

<table>
<thead>
<tr>
<th>Country</th>
<th>China’s 2003 market share</th>
<th>Price drop</th>
<th>Estimated σ</th>
<th>Partial effect on own exports</th>
<th>Partial effect on other countries</th>
<th>Average market growth rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>22.4%</td>
<td>36.0%</td>
<td>Upper 95% bound, 2.602</td>
<td>+ 44.7%</td>
<td>− 13.8%</td>
<td>8.3% (1991-2003)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.935</td>
<td>+ 26.1%</td>
<td>− 8.1%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower 95% bound, 1.269</td>
<td>+ 6.5%</td>
<td>− 2.3%</td>
<td></td>
</tr>
<tr>
<td>EU</td>
<td>24.4%</td>
<td>54.0%</td>
<td>Upper 95% bound, 1.327</td>
<td>+ 13.3%</td>
<td>− 4.3%</td>
<td>5.3% (1995-2003)</td>
</tr>
</tbody>
</table>

Source: OECD, Regressions II and III. Author’s calculations.

The estimates of the partial effect on other countries due to China do not seem to entirely negate whole-market growth. The upper 95% bound for the US import market creates a negative impact of 13.8% – 8.3% = 5.5% on other country exports to the US market, but otherwise the values do not seem to indicate that China will cause a drastic drop in other countries’ exports. Furthermore, other countries can also cut their own prices, increasing their export volumes. February’s year-to-date empirical evidence (China and Hong Kong’s exports rising by 55.5% – 13.8% total growth = + 41.7% partial effect on own exports) came with an 11.4% drop in its price level, somewhat less of a price drop than predicted; this is perhaps indicative of
macroeconomic lags. These figures nevertheless correspond to some $\sigma$ above the upper 95% bound. It seems that the EU figures are possibly inaccurate, as pointed out earlier in this section. If one assumes that the elasticities for the EU are similar to that for the US, the estimated effect is much larger. These figures however only estimate the partial effect of the abolition of China’s quotas. Each country experiences a similar partial effect from each country that was previously restricted by quotas, though as indicated in Chapter 2, these effects are likely to pale in comparison to that of China’s as most other countries were much less restricted.

Here, we emphasize the role that overall growth in the import market size has in mitigating the China-induced effects of quota abolition on other countries. This can arise from a fall in domestic production. For instance, the US Department of Commerce’s February 2005 year-to-date data indicates that market volume increased by a huge 15.2% and market value by 13.8%. McKinnon (2004) frames this as part of a larger phenomenon of de-industrialization, arising from a large fiscal deficit that creates a large current account deficit. This current account deficit transfers saving from other countries to the US in the form of foreign-manufactured goods. This then increases the size of the import market for goods in general, and in the case of this essay, clothing.

Next, we examine the estimates of the time trends, which have now been controlled for price changes. The aggregated imports of the rest of the world also have a trend coefficient close to 0. This indicates that in the US market and EU markets, time trends do not indicate that China is having any significant advantages over the rest of the world. Any advantage is thus based on price competition, much unlike in the Japanese market, where the negative coefficient implies China likely has an advantage, perhaps based on geographical proximity.
The estimates for the ASEAN-5 countries corroborate the trends graphed in figures 11 to 16 in Appendix III. They indicate that the unexplained growth of the ASEAN-5 countries’ clothing exports occurred at a slower rate than China in both the European and Japanese import markets. These trends are however not significantly less than zero, except for Singapore in the Japanese import market. The US import market then sees unexplained growth of ASEAN-5 clothing exports occurring at a rate slightly faster than China’s. The estimates are however insignificant, even at the 10% level. This indicates that the ASEAN-5 countries are not in a good position to counter price cuts on Chinese clothing exports as China’s “non-price competitiveness” is increasing faster than theirs. They are thus likely to be adversely affected by the quota abolition.

The poorer ASEAN countries, on the other hand, generally return positive estimates, indicating that their exports have grown at a rate faster than China’s after controlling for China’s lower prices. More results here are statistically significant. There are significantly positive trends for Cambodia and Vietnam in the US import market, for Myanmar in the EU import market, and for Brunei, Laos, Myanmar and Cambodia in the Japanese import market. This indicates that the exports of the poorer ASEAN countries have been growing at a faster rate than China as the trends in figures 14 through 16, and that this trend is not moreover not due to competitive pricing, in which they are unable to compete with China. This faster rate of improvement in “non-price competitiveness” could provide some reprieve after the quota abolition.

Time trends in economic analysis arise due to a wide range of reasons; indeed they are used is to proxy unobserved variables that are assumed to be changing steadily with time. What are some possible reasons, not captured by the model, that have caused this trend?
First, the extreme trends in the US market (Vietnamese export demand growing at a rate exceeding the growth rate of Chinese exports by 80% per year, and 114% per year for Cambodian export demand) imply that perhaps the model does not fully account for the quota-hopping out of China. The nonnegative trends in the more restricted US import market for the more expensive ASEAN-5 countries also make this case (though to a lesser extent). This is further corroborated by the much lower $R^2$ values for the US and EU import markets, indicating that perhaps quota effects are not fully reflected in prices, giving the model less explanatory power.

This reflection of the quota-hopping effect in the time trend may arise from the model’s assumption that quotas on China have an equal effect on every other country. Since the value of $\rho_{\text{Rest of world}} - \rho_{\text{China}}$ is not significantly greater than zero, this equal effect for the rest of the world is likely accounted for. However, perhaps Cambodia and Vietnam were two fairly competitive low-cost alternatives that received a disproportionate share of the benefits of quota restraints on China. Their geographical locations in Indochina, as well as the aforementioned favorable growth in quota allocations by the US, gave them a good position to receive these benefits. To this extent, Mekong Capital (2003) find from interviews with clothing manufacturers in Cambodia that a large proportion of Cambodian clothing manufacturing processes are subcontracted from China—perhaps from companies that faced quota constraints. If the significantly positive sign of this trend is due to these reasons, the quota abolition process will eliminate this trend and the artificial advantages that these countries have over China. A particularly acute reversal of FDI flow, now going out of these countries, is a distinct possibility.

An exchange rate explanation may also be in order. Vietnam’s and Cambodia’s strong export performance may be due to the depreciation of their currencies against the US dollar over
this time period. With the Chinese peg to the US dollar, this would have made their clothing exports relatively cheaper relative to Chinese exports, giving these countries leverage to outperform Chinese exports. However, several other ASEAN countries such as Indonesia, Thailand, and the Philippines also saw their currencies depreciate over this time period, without any corresponding significant time trend. This detracts from an exchange rate explanation.

However, the time trends in the Japanese market are also significantly positive, indicating that perhaps not all of the positive trends in the US and EU markets are due to quota-hopping. The Japanese market may then provide some indicator as to how much of the time trend is due to quota-hopping. There, the poorer ASEAN countries still see unexplained exports increasing at 30-40% per year faster than China. This statistically significant result indicates that some proportion of the time trends are due to some factors other than quota-hopping. Since the model is of a demand function, these factors could be demand-side parameters.

Over the time period in question, GDP in the US and the EU was on an upward trend. The Armington model assumes a constant income elasticity of demand for clothing-in-general, before the cost-minimization over different countries. However, perhaps in reality the elasticity of demand for clothing differs across imports from various countries, something that is not accounted for by the Armington model. For instance, if consumers look for favorable working conditions in the production of products they wear, the income elasticity of demand for Cambodian-produced clothing might be higher than that for other countries due to a reputation for good labor standards, such as minimum wage laws, in the country.

Alternatively, the demand function could also be sensitive to conditions in the ASEAN countries and China, especially if this demand function for clothing is seen as a function for the supply of clothing-oriented FDI to the recipient country. This includes many different factors,
and there exists vast amounts of literature on the determinants of FDI. Just one of the
determinants of FDI and trade patterns, other than quotas, is that of general business climate and
infrastructure (USITC, 2004). Frenkel et al. (2004) find that general economic development (as
proxied by GDP growth and Euromoney economic risk ratings) is significant in helping attract
FDI flows. According to UN data, Cambodia, Laos, Myanmar and Vietnam consistently
experienced growth rates of 4% of more during the 1990s, except during the Asian Economic
crisis of 1998. Though these countries still face many infrastructural challenges, this economic
growth was accompanied by some infrastructural developments such as the development of
clothing-manufacturing clusters, helping manufacturers enjoy external economies of scale
(Mekong Capital, 2003). The poorer ASEAN countries are starting out at a lower level of
economic and infrastructural development than China, and perhaps these are now increasing at a
faster rate if one sees decreasing returns to these developmental investments.

Finally, implicit in the model laid out here is that the absolute price level, or absolute
advantage, is a key determinant of competitiveness and trade. However, comparative advantage
has a role to play too, and perhaps the time trend captures changes in comparative advantage.
This can be viewed in the context of the Flying Geese model of economic development (which is
best reflected in the regression results for the Japanese import market). The level of comparative
advantage helps determine a country’s export values at any one point of time, but the rate of
change of comparative advantage influences the rate of change of export values. Each cycle in
the Flying Geese model in figure 5 sees comparative advantage in any one particular industry
first increase at a fast rate, then taper off to eventually level off, then decrease. In this model, the
poorer ASEAN countries’ comparative advantage in clothing production is increasing at a faster
rate than that of China’s because they are one or two cycles behind China. Singapore’s
comparative advantage in clothing is increasing at a rate slower than that of China, and perhaps even decreasing as Singapore has moved into more capital-intensive industries. The rate of change of comparative advantage of the other ASEAN-5 countries is not significantly different from that of China’s, though possibly slightly slower than China’s, and may even be decreasing if their decline in the Japanese market is an indication of this. Since the analysis deals with relative rates of change, it is difficult to come to a conclusion about the rate of change of China’s own comparative advantage. Nevertheless, the differential rate of change between it and the rest of the world is not significantly different from zero, indicating that most other exporters are vulnerable to price cuts.

In all, these positive time trends indicate that the rate of increase of “non-price competitiveness” via reasons such as comparative advantage is possibly higher in some poorer ASEAN countries than in China. Vietnam and Cambodia in the US market, and Myanmar in the EU market, seem slightly less vulnerable to the Chinese price cuts once this is taken into account. This result, however, is very sensitive to the amount of the time trend that is due to manufacturing diverted from China. The other ASEAN countries, on the other hand, see insignificant trends, giving them more reason to be vulnerable to the quota abolition. The Japanese market, in particular, seems to be a viable option for the poorer ASEAN countries to diversify into, as they have gained a bigger market share of this market, even as China has come to dominate it. It is however an untapped option, as these countries export very little to the Japanese market relative to the US and EU markets. In 2003, Cambodia’s clothing exports to Japan were a mere 0.5% of clothing exports to the US and EU. This figure was 0.8% for Laos, 5.4% for Myanmar, and 15.9% for Vietnam.
6. Conclusion

This study has been two pronged, aimed at exploring the intersection of the challenge that China poses to the ASEAN countries, and the liberalization of global trade in textile and clothing. There are many more aspects to China-ASEAN competition, as there are in the end of quotas. At this particular intersection, many analysts project that China seems poised to increase its exports to the US and EU markets. The ASEAN countries are expected to be the losers from this process because their textile and clothing industries are largely competitive with China’s. This is due to their large concentration in the clothing export sector, and China’s lack of integration into the international supply chain. Within ASEAN, the less developed member economies are likely to be especially vulnerable, with the textile and clothing industry taking up a very large proportion of their exports. In particular, Cambodia’s export industry lacks diversity.

To analyze competition between these countries, Armington’s model and many analyses emphasize the importance of prices in explaining export performance. Price competition alone indicates that the ASEAN countries should be adversely affected. However, initial data gathered by the US Commerce Department, which shows that as of February 2005, Vietnamese clothing exports to the US grew by 21.6% in quantity and 19.8% in value, and Cambodian clothing exports by 13.8% in quantity and 9.9% in value. This occurred despite the much-increased competitive market presence of China. As expected, some other ASEAN countries did not fare so well. Thailand and Indonesia saw some growth, but Singapore, Malaysia, the Philippines, and Laos all saw their export values shrink. Collectively, ASEAN clothing exports to the US grew by 9.9% by volume and 8.8% by value.

There are several explanations for this, a primary one being an increase in the overall size of the import market. The robust growth of ASEAN textile and clothing exports in the face of
Chinese competition is also helped by such increases, brought about by an increase in demand in general, as well as a fall in domestic production.

Also, the FDI and trade patterns that characterize the textile and clothing industry involve more complex determinants. We have tried to proxy some of these more complex determinants with a time trend. There are no significant differences between China and the ASEAN-5 countries when it comes to the unexplained, non-price related, rates of change of exports. The data thus indicates that the ASEAN-5 countries have no non-price advantage over China (and likely, none over the import market as a whole), so are vulnerable to price competition from China. However, if the Japanese market is any indication, the quotas on textile and clothing seem to have simply shored up what is a declining industry. The textile and clothing sector is of less importance to these countries than other sectors, as predicted by the Flying Geese model of development, where industrialization is shifting the countries to a different product life-cycle. These countries will have some difficulties competing with China in this sector, but the effect on them should not be exaggerated.

However, the trends were found to be positive for the less developed, more vulnerable ASEAN economies. They were significantly positive for Vietnam and Cambodia in the US, and for Myanmar in the EU—though Laos, on the other hand, seems to be uncompetitive in both the US and EU market. These are likely because these countries, close to China, are a logical destination for quota-hopping FDI. However, it is also quite probable that some part of these trends have occurred independent of quotas, as evidenced by the Japanese market. They are possibly an indication of comparative advantage in clothing production increasing at a faster rate that China. This helps these countries tide over the MFA quota abolition.
As such, there are likely to be large adjustment costs as these relatively inefficient economies are exposed to free-market competition. However, one should not exaggerate the extent to which these countries will be driven out of the market by China. In the long run, with the proper application of management, financial resources, and further investment in much-needed infrastructural development, it is quite possible that they will be able to survive in a post-quota world. However, economic development has little impact without a concomitant reduction in corruption, as Globerman and Shapiro (2002) emphasize the importance of good governance in attracting FDI. A positive spin to the end of the quota markets is that exposure to competition might even help these economies become less corrupt and more efficient in order to remain competitive in competitive international markets.

There has also been a recent emphasis on economic cooperation amongst the ASEAN economies. Increasing economic linkages between the ASEAN economies, and the emergence of a textile and clothing supply chain that utilizes the strengths that each has at any one particular stage of the supply chain, will also help these poorer countries (Wattanapruttipaisan, 2005). Likewise, closer economic integration with China could also help the poorer countries, as in 2004, China invested $35 million in Cambodia’s garment industry and $217 million overall, ranking as Cambodia’s largest investor (China Daily, 2005).

Even if some of the positive trends are due to quota-hopping, it is still possible they will not disappear in the near future, due to the uncertainty created by the safeguard provisions. Recent news articles point out that there is mounting pressure to impose these provisions and reinstate the quota regime (Blustein, 2005). In April 2005, the US Department of Commerce started an investigation to determine if market disruption had occurred (Barboza, 2005). Similarly, the EU announced import volume alert zones for Chinese exports, beyond which
investigations would be conducted, possibly resulting in safeguards (Europa, 2005). Statham (2004) argues that many manufacturers will avoid increasing their presence in China, and buyers from purchasing products made in China, due to the possibility that their orders will not be able to be fulfilled. There remains, over the next few years at least, a temporary reprieve for other clothing producers.

I therefore find the outlook for the post-MFA ASEAN countries to be less bleak than that which most analysts predict. China’s market share will increase quite dramatically in the US and EU markets. However, the positive effect of China’s price cuts on its own market share is much greater than the negative effect on other countries, and the overall import market size is also expected to increase. Moreover, the price cuts from quota abolition are a one-time effect; the time trend shows no significant advantage for China in the US and EU. Evidence from the Japanese import market indicates that in the long run, the ASEAN countries that are starting to climb the ladder of industrial development via clothing manufacturing should be able to secure export growth, even when exposed to direct competition with China. These might be further boosted by even more favorable tariff concessions via provisions under schemes such as the GSP—quotas, after all, are just one part of the trade distortion puzzle; in a post-quota world, differential tariff provisions will play a much larger role. The ASEAN-5 countries, on the other hand, might be better off specializing in other industries where they enjoy comparative advantages vis-à-vis China.  

---

13 Though some, such as Coxhead (2004), have argued that the span of such industries is ever-decreasing, with the ASEAN-5 countries pushed towards natural resource-based exports.
References


# Appendix I: Abbreviations used

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASEAN</td>
<td>Association of Southeast Asian Nations</td>
</tr>
<tr>
<td>ASEAN-5</td>
<td>Singapore, Malaysia, Thailand, Indonesia, Philippines</td>
</tr>
<tr>
<td>BRN</td>
<td>Brunei Darussalam</td>
</tr>
<tr>
<td>CHN</td>
<td>China</td>
</tr>
<tr>
<td>IDN</td>
<td>Indonesia</td>
</tr>
<tr>
<td>LAO</td>
<td>Laos</td>
</tr>
<tr>
<td>KHM</td>
<td>Cambodia</td>
</tr>
<tr>
<td>MMR</td>
<td>Myanmar</td>
</tr>
<tr>
<td>MYS</td>
<td>Malaysia</td>
</tr>
<tr>
<td>PHL</td>
<td>Philippines</td>
</tr>
<tr>
<td>SGP</td>
<td>Singapore</td>
</tr>
<tr>
<td>THA</td>
<td>Thailand</td>
</tr>
<tr>
<td>VNM</td>
<td>Vietnam</td>
</tr>
<tr>
<td>ROW</td>
<td>Rest of the World</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATC</td>
<td>Agreement on Textiles and Clothing</td>
</tr>
<tr>
<td>MFA</td>
<td>Multifiber Agreement</td>
</tr>
</tbody>
</table>
Appendix II: Construction of Sub-sectors

Table 1: Constructed classifications, Harmonized Classification 1996

<table>
<thead>
<tr>
<th>Classification number</th>
<th>Sector</th>
<th>Constructed classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>Silk</td>
<td>Natural fiber</td>
</tr>
<tr>
<td>51</td>
<td>Wool</td>
<td>Natural fiber</td>
</tr>
<tr>
<td>52</td>
<td>Cotton</td>
<td>Natural fiber</td>
</tr>
<tr>
<td>53</td>
<td>Paper Yarn</td>
<td>Yarns</td>
</tr>
<tr>
<td>54</td>
<td>Man-made Filaments</td>
<td>Manmade fibers</td>
</tr>
<tr>
<td>55</td>
<td>Man-made Staple Fibers</td>
<td>Manmade fibers</td>
</tr>
<tr>
<td>56</td>
<td>Wadding</td>
<td>Yarns</td>
</tr>
<tr>
<td>57</td>
<td>Carpets</td>
<td>Fabrics</td>
</tr>
<tr>
<td>58</td>
<td>Special Woven Fabrics</td>
<td>Fabrics</td>
</tr>
<tr>
<td>59</td>
<td>Laminated Textile Fabrics</td>
<td>Fabrics</td>
</tr>
<tr>
<td>60</td>
<td>Knitted Fabrics</td>
<td>Fabrics</td>
</tr>
<tr>
<td>61</td>
<td>Apparel, Knitted</td>
<td>Clothing</td>
</tr>
<tr>
<td>62</td>
<td>Apparel, not Knitted</td>
<td>Clothing</td>
</tr>
<tr>
<td>63</td>
<td>Other Textile Articles</td>
<td>Fabrics</td>
</tr>
</tbody>
</table>

Table 2: Constructed classifications, SITC Revision 3

<table>
<thead>
<tr>
<th>Classification number</th>
<th>Sector</th>
<th>Constructed classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>S3-26</td>
<td>Textile fibers</td>
<td></td>
</tr>
<tr>
<td>S3-261</td>
<td>Silk</td>
<td>Natural fiber</td>
</tr>
<tr>
<td>S3-263</td>
<td>Cotton</td>
<td>Natural fiber</td>
</tr>
<tr>
<td>S3-264</td>
<td>Jute, other text. bast.fibers</td>
<td>Natural fiber</td>
</tr>
<tr>
<td>S3-265</td>
<td>Vegetable textile fibers</td>
<td>Natural fiber</td>
</tr>
<tr>
<td>S3-266</td>
<td>Synthetic fibers.</td>
<td>Manmade fibers</td>
</tr>
<tr>
<td>S3-267</td>
<td>Other man-made fibers.</td>
<td>Manmade fibers</td>
</tr>
<tr>
<td>S3-268</td>
<td>Wool, other animal hairs.</td>
<td>Natural fiber</td>
</tr>
<tr>
<td>S3-269</td>
<td>Worn clothing, textile articles</td>
<td>Fabrics</td>
</tr>
<tr>
<td>S3-65</td>
<td>Textile Yarn, fabric etc.</td>
<td></td>
</tr>
<tr>
<td>S3-651</td>
<td>Textile yarn</td>
<td>Yarns</td>
</tr>
<tr>
<td>S3-652</td>
<td>Cotton fabrics, woven.</td>
<td>Fabrics</td>
</tr>
<tr>
<td>S3-653</td>
<td>Fabrics, of man-made fibers</td>
<td>Fabrics</td>
</tr>
<tr>
<td>S3-654</td>
<td>Other textile fabrics, woven</td>
<td>Fabrics</td>
</tr>
<tr>
<td>S3-655</td>
<td>Knit, crochet fabrics NES</td>
<td>Fabrics</td>
</tr>
<tr>
<td>S3-656</td>
<td>Tulle, lace, embroidery, etc.</td>
<td>Fabrics</td>
</tr>
<tr>
<td>S3-657</td>
<td>Special yarn, textile fabric</td>
<td>Fabrics</td>
</tr>
<tr>
<td>S3-658</td>
<td>Textile articles NES.</td>
<td>Fabrics</td>
</tr>
<tr>
<td>S3-659</td>
<td>Floor coverings, NES.</td>
<td>Fabrics</td>
</tr>
<tr>
<td>S3-84</td>
<td>Clothing and accessories.</td>
<td>Clothing</td>
</tr>
</tbody>
</table>

14 For some data on imports of “Apparel / final articles” in this paper, an SITC Revision 2-based classification is used. S2-84 is the only representative for this category.
Appendix III: Graphs of China and ASEAN presence in major import markets

Figure 11: US clothing imports from ASEAN-5 (1991-2003)

Figure 12: EU clothing imports from ASEAN-5 (1995-2003)
Figure 13: Japan clothing imports from ASEAN-5 (1991-2003)

Source: OECD
Figure 14: US clothing imports from non-ASEAN-5 (1991-2003)

Figure 15: EU clothing imports from non-ASEAN-5 (1995-2003)
Figure 16: Japan clothing imports from non-ASEAN-5 (1991-2003)

Source: OECD
Appendix IV: Mathematical appendix

Derivation of Equations (2), (3), (4)

To solve the cost-minimization problem for each indifference level curve \( \phi(X_1, X_2, \ldots, X_n) \), the price per marginal utility of each good imported from each country \( i \) has to be equal. The partial derivatives of \( \phi(X_1, X_2, \ldots, X_n) \) with respect to each of the imports from \( n \) countries, \( X_i \), are:

\[
\frac{\partial \phi}{\partial X_i} = \left[ \sum_{i=1}^{n} \beta_i X_i^{-\frac{1}{\sigma}} \right]^{\frac{1}{\sigma-1}} \left( \beta_i X_i^{-\frac{1}{\sigma}} \right) = \beta_i X_i^{-\frac{1}{\sigma}} X^\frac{1}{\sigma}
\]

— (11)

Now taking the first order conditions for cost-minimization to reach the level curve of \( \phi(X_1, X_2, \ldots, X_n) \), necessary conditions for the optimum product mix in the import market are:

\[
\frac{P_i}{\partial \phi} \frac{\partial \phi}{\partial X_i} = \frac{P_j}{\partial \phi} \frac{\partial \phi}{\partial X_j} \iff \frac{P_i}{P_j} = \frac{P_j}{P_i} \iff \frac{X_i}{X_j} = \left( \frac{\beta_i}{\beta_j} \frac{P_j}{P_i} \right)^{\sigma}
\]

— (12)

Which reflects the homothetic nature of our CES utility function.

From this relationship, Armington defines the price per util of our good in question,

\[
P = \frac{P_1}{\partial \phi} \frac{\partial \phi}{\partial X_1} = \frac{P_2}{\partial \phi} \frac{\partial \phi}{\partial X_2} = \ldots = \frac{P_n}{\partial \phi} \frac{\partial \phi}{\partial X_n}
\]

— (13)

and note that by substituting equation (11) into equation (13), one obtains equation (2),

\[
P = \frac{P_i}{\beta_i X_i^{-\frac{1}{\sigma}}} \iff X_i = \beta_i X_i^{-\frac{1}{\sigma}} \left( \frac{P_i}{P} \right)^{-\sigma}
\]

and subsequently equation (3).

Also, equation (14) implies that for \( i = 1 \) to \( n \),

\[
P_i X_i = P \cdot \frac{\partial \phi}{\partial X_i} \cdot X_i
\]
and that since \( \phi(X_1, X_2, \ldots X_n) \) is homogeneous of degree 1, i.e. is linearly homogeneous, by Euler’s Theorem\(^{15} \),

\[
\Rightarrow \sum_{i=1}^{n} P_i X_i = \sum_{i=1}^{n} P \cdot \frac{\partial \phi}{\partial X_i} \cdot X_i = PX
\]

— (14)

PX is equivalent to money expenditure on all goods in our chosen category. The intuition behind this is that X is the number of utils in our current utility level curve, and P is the price per util.

Rearranging (15), and by total differentiation,

\[
P = \sum_{i=1}^{n} P_i \frac{X_i}{X}
\]

\[
\frac{dP}{P} = \sum_{i=1}^{n} \left[ \frac{P_i X_i}{PX} \cdot \frac{dP_i}{P_i} \right] + \sum_{i=1}^{n} \left[ \frac{P_i X_i}{PX} \cdot \frac{dX_i}{X} \right]
\]

— (15)

And Armington points out that the second term, a weighted average of the changes in quantity market share, is equal to zero. This indicates that percentage changes in the overall price level for a particular import market is a weighted sum (by market value shares) of percentage changes in the prices of imports from each individual country.

Now totally differentiating (3) and substituting in (15),

\[
\frac{d(P_i X_i)}{P_i X_i} = \frac{d(PX)}{PX} + (1 - \sigma) \left( \frac{dP_i}{P_i} - \frac{dP}{P} \right)
\]

\[
= \frac{d(PX)}{PX} + (\sigma - 1)(1 - S_i) \left( \frac{dP_i}{P_i} \right) - (\sigma - 1) \left[ \sum_{j \neq i}^{n} S_j \cdot \frac{dP_j}{P_j} \right]
\]

— (16)

where \( S_i \) is the market value share of the import market, for country \( i \).

---

\(^{15}\) Euler’s Theorem states that given a function \( f: \mathbb{R}^n \rightarrow \mathbb{R} \), and if \( f \) is homogeneous of degree 1, then

\[
f(X_1, X_2, \ldots X_n) = X_1(\partial f / \partial X_1) + X_2(\partial f / \partial X_2) + \ldots + X_n(\partial f / \partial X_n)
\]

Gallaway et al. (2003) estimate these values for the US import market using monthly data, which they do not find to be significantly different from estimates using quarterly data.

Table 10: Armington elasticity results from Gallaway et al. (2003)

<table>
<thead>
<tr>
<th>SIC code</th>
<th>Description</th>
<th>Short-run elasticity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Elasticity</td>
</tr>
<tr>
<td>2311</td>
<td>Men’s, boy’s suits, coats</td>
<td>1.177</td>
</tr>
<tr>
<td>2321</td>
<td>Shirts, men’s and boy’s</td>
<td>1.183</td>
</tr>
<tr>
<td>2322</td>
<td>Men’s / boy’s underwear</td>
<td>0.368</td>
</tr>
<tr>
<td>2323</td>
<td>Men’s and boy’s neckware</td>
<td>0.849</td>
</tr>
<tr>
<td>2325</td>
<td>Men’s / boy’s trousers, slacks</td>
<td>0.040</td>
</tr>
<tr>
<td>2329</td>
<td>Men’s / boy’s clothing</td>
<td>0.861</td>
</tr>
<tr>
<td>2331</td>
<td>Women’s blouses and waists</td>
<td>-0.100</td>
</tr>
<tr>
<td>2335</td>
<td>Women’s dresses</td>
<td>0.622</td>
</tr>
<tr>
<td>2337</td>
<td>Women’s suits and coats</td>
<td>1.055</td>
</tr>
<tr>
<td>2339</td>
<td>Other women’s outerwear</td>
<td>1.063</td>
</tr>
<tr>
<td>2341</td>
<td>Women’s / children’s underwear</td>
<td>1.124</td>
</tr>
<tr>
<td>2342</td>
<td>Brasieres, allied garments</td>
<td>-0.588</td>
</tr>
<tr>
<td>2353</td>
<td>Hats and caps</td>
<td>0.368</td>
</tr>
<tr>
<td>2371</td>
<td>Fur goods</td>
<td>0.827</td>
</tr>
<tr>
<td>2384</td>
<td>Robes and dressing gowns</td>
<td>0.891</td>
</tr>
<tr>
<td>2385</td>
<td>Waterproof outergarments</td>
<td>0.881</td>
</tr>
<tr>
<td>2386</td>
<td>Leather / sheep lined clothing</td>
<td>1.356</td>
</tr>
<tr>
<td>2389</td>
<td>Other apparel, accessories</td>
<td>1.364</td>
</tr>
<tr>
<td>2391</td>
<td>Curtains, draperies</td>
<td>1.091</td>
</tr>
<tr>
<td>2392</td>
<td>Other house furnishings</td>
<td>0.086</td>
</tr>
<tr>
<td>2393</td>
<td>Textile bags</td>
<td>1.020</td>
</tr>
<tr>
<td>2394</td>
<td>Canvas and related products</td>
<td>0.998</td>
</tr>
<tr>
<td>2395</td>
<td>Pleating and stitching</td>
<td>0.983</td>
</tr>
<tr>
<td>2396</td>
<td>Automotive / apparel trimmings</td>
<td>0.735</td>
</tr>
<tr>
<td>2399</td>
<td>Other fabricated textile products</td>
<td>1.184</td>
</tr>
</tbody>
</table>

Source: Gallaway et al. (2003)