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Trading Apparel: Developing Countries in 2005

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Abstract

This paper estimates the determinants of the shares of various developing countries in total U.S. apparel imports. We make use of two new sources of data: new export tax-equivalent estimates of the QRs under the ATC and qualitative information from surveys of major exporting firms. The export tax-equivalents are estimated using license prices from nine developing countries. The firm data was collected from 14 major textile, clothing and trading companies located in Hong Kong but operating throughout Asia. They capture the importance of factors influencing sourcing decisions. While we find that the degree of restraint imposed by the quotas is an important influence in a supplier's market share, other factors including production costs, tariffs, quality of infrastructure, and transport costs also play major roles.

Keywords: ATC, MFA, TEXTILES, CLOTHING, LIBERALIZATION, QUOTAS,

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1. Introduction

According to the Agreement on Textiles and Clothing (ATC), the U.S., Canadian, and EU quantitative restrictions (QRs) on textiles and apparel imports are to be phased out by January 1, 2005. How will this phaseout affect developing country exporters? Although the elimination of MFA quotas is predicted to result in an increase in global trade, the impact is likely to differ among countries and regions.[1] For each individual country, quota elimination represents both an opportunity and a threat: an opportunity because markets will no longer be restricted and a threat because other suppliers will no longer be restrained and major markets will be open to intense competition (Kathuria and Bhardwaj, 1998, Yang and Mlachila 2004). In much of the popular press, China is expected to win most of the newly freed market to the detriment of other developing country exporters.

A few early econometric studies suggest that the QRs under the MFA significantly distorted the pattern of exports across developing countries. Thus, we might anticipate that countries which are highly restricted now, will gain relatively larger shares in 2005. Dean (1990) showed evidence that the QRs under MFA I, II, and III were indeed binding on exporting countries, even though some quotas showed low utilization rates. Dean (1995) showed that the expanson of the MFA restraint system targeted small exporters with rapid growth in sales to the U.S., thus limiting their ability to expand import shares. Spinanger (1999) found evidence that EU textile and apparel restraints have inhibited expected diversification of the market across exporting countries based on relative cost. However, EU and U.S. regional agreements have also distorted the pattern of exports, leading to unusually high import shares for some European or Mediterranean countries in the EU market, and to Mexico in the U.S. market.

Recent simulation studies have predicted that ASEAN and South Asian countries and China are likely to experience the largest exports expansions, while Hong Kong, Taiwan and South Korea, as well as Latin American and African countries will likely see relatively small expansions (and possibly reductions) in exports.[2] While the degree of restraint imposed by the MultiFibre Agreement (MFA) quotas is important in determining the extent of the impact of their removal on world trade patterns, other

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[1] For instance, Diao and Somwaru (2001) estimate that over the 25-year period following the ATC implementation, the annual growth of world textile and apparel trade would be more than 5 percent faster than in the absence of the ATC. According to their simulations, this acceleration translates into about $20 billion more trade in the short run (upon implementation) and as much as $200 billion in the long run (25 years). Similar results are reported by Avisse and Fouquin (2001), who find that, as a result of the ATC, the global trade in textiles and apparel would be about 10 percent and 14 percent higher, respectively.

[2] See for example, Avisse and Fouquin (2001).Diao and Somwaru (2001), and Terra (2001).

(competitiveness) factors such as political stability, infrastructure, or labor quality are also likely to be very influential in the post-2005 market position of different exporters.[3]

This paper estimates econometrically the determinants of a developing country's share of U.S. imports of apparel products. It is structured as follows. In section 2, we provide a brief characterization of the textiles and apparel quota system, and quantify their restrictiveness using license prices compiled for nine major suppliers. Section 3 discusses a number of non-quota factors that are important in influencing the patterns of textiles and apparel trade, and location and sourcing decisions. It presents qualitative data from surveys of 14 major textile, clothing and trading companies located in Hong Kong but operating throughout Asia. They capture the importance of factors influencing investment as well as sourcing decisions.

Section 4 sets up a structural model that yields an econometric specification for testing the relationship between a supplier's share of the U.S. import market for apparel, and the degree of restrictiveness of the quotas as well as other non-quota factors. Section 5 presents the data and the estimation techniques used to test the relationships derived in the previous section. Section 6 discusses the results, and section 7 concludes with a few policy implications of the paper's findings.

2. Quotas on textiles and apparel

In 2002, the United States had quantitative restraints on textiles and apparel imports from 45 suppliers, which accounted for almost 80 percent of the total U.S. imports of such goods (see table 1). Because the restraints are administered in the form of Avoluntary@ export restraints (VERs), they affect the market in a unique way.[4] VERs are *discriminatory*, i.e., they are imposed on some countries and not on others. Thus, *unrestrained* exporters can still undercut a restrained exporter, and capture its market share. VERs are also *bilaterally negotiated*. Thus, the particular products restrained, and the severity of the restraints vary across exporting countries. Lastly, VERs are *supply-side* restraints, i.e. they are implemented by the exporting country. Exporting country governments typically restrain the export of a product to the United States by issuing licenses to their exporters, such that total exports of each product are less than or equal to the quota allocated to that country for that product. Hence, the restraints in textiles and apparel are also commonly referred to as *bilateral quotas,* or simply *quotas* (though they are distinct from import quotas).

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[3] USITC (2004) provides a detailed assessment of the competitiveness of different supplier of textile and apparel products to the U.S. market.
[4] The U.S., European, and Canadian VERs in textiles and apparel have long been a standard textbook example. As is well known, they are not voluntary. They are imposed at the request of the importing country, and agreed to by the exporting country to avoid the imposition of other types of trade barriers. For the seminal empirical study on this topic, see Hamilton (1986). For a more in-depth examination see Takacs (1978).

In 2002, twenty-eight out the 45 restrained suppliers had at least one quota category filled at 85 percent—a fill rate that could be considered binding.[5]   As shown in table 1, the number of binding quota categories vary greatly among those suppliers, with China and Indonesia having high fill rates for as many as 58 and 38 quota categories, respectively.[6]   A casual look at the numbers in the table suggests that larger suppliers (in terms of their share of total U.S. imports) tend to have more binding categories.

Simply counting the number of highly utilized quota categories, however, provides only a very small fraction of the full story with respect to the actual restrictiveness of the quota system on a given supplier. A binding quota effectively limits the supply to the U.S. market of a given product, making its price higher in the United States than in the world market. Given the resulting price wedge, the limited and scarce supply of quotas becomes valuable and economic rents (in the form of the ability to charge higher prices) accrue to firms that have access to them. These quota rents can also be viewed as an implicit tax on exports of textiles and apparel from restrained countries to the United States: in order to export, a firm in a quota-constrained country has to obtain or buy the right to use the quota (or an export license). Given that the quotas impose a cost on exporting firms that is analogous to an export tax, one common way to measure their restrictiveness is to compute their export tax-equivalent (ETE). This measures the degree to which the quota increases the export price (i.e., the price before entry into the U.S. market).[7]

The most straightforward way to compute the ETEs is to use license price data which can be reasonably assumed to capture the "value" of the quota or the exporter's maximum willingness to pay for the right to export a given commodity (identified at the MFA quota category).[8]   License prices could also be thought as a broad measure of the cost gap between actual production costs and freight-on-board

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[5] A variety of threshholds have been used in the literature as denoting a binding constraint. The actual extent of utilization can be difficult to measure and quotas can be binding despite relatively low utilization rates.   For further discussion of this issue, see USITC (2002), chapter 3.

[6] In general, the literature reveals that Asian countries are relatively more constrained than other regions. Flanagan (2003) categorizes countries into groups depending on how "quota-constrained" they are in terms of the number of product categories where quotas seriously hold back demand. In the group of "Countries seriously held back, almost across the board, by quota today" are Bangladesh, China, Hong Kong, India, Indonesia, Pakistan, Philippines, Korea, Sri Lanka, and Thailand. At the other end of the spectrum, countries such as Nepal, Oman, Qatar, and United Arab Emirates (UAE) are categorized as "Countries whose quotas have been a valuable tool, now threatened." According to Flanagan, China, India and Indonesia have shown the most consistent and widespread near-saturation of quotas for yarn, fabric, and garments.

[7] See, for example, Francois and Spinanger (2002).

[8] In addition to the prices of the license quotas themselves, the nature or the quality of the quota administration system can also restrict an individual country's exports. Whalley (1999) points out that many developing countries have built costly domestic administrative structures around the internal allocation of MFA quotas. Krishna and Tan (1998) present empirical evidence that the costs of the export license system within the restrained countries are significant and that both the license cost as well as these hidden administrative costs are added to the price of the product prior to entering the foreign market. These extra inefficiency costs would also be eliminated when the quotas are removed which would likely intensify the estimated effects of the ATC.

(f.o.b.) prices in the U.S. market. In this paper, we collected actual license prices from a variety of sources for nine suppliers. These countries (Bangladesh, Cambodia, China, Hong Kong, India, Indonesia, Macau, Pakistan, and Taiwan) account for about 36 percent of total U.S. import of textiles and apparel, and almost 50 percent of U.S. imports facing restrictive quotas.[9]

The collected quota prices are often listed on a monthly basis, in the local currency, and in terms of a quota category-specific unit (e.g., doz, kg., nos.). To obtain the export tax equivalents, we first convert the 2002 quota prices for those suppliers to an annual U.S. dollar by Square Meter Equivalent (SME) basis. For each apparel quota category (j) and each of the nine suppliers (i), we then approximate the production costs (or, alternatively, supply price net of rent) (denoted PC_{ij}) as the difference between the f.o.b export unit value of export to the U.S. market (UV_{ij}) and the license price per unit (L_{ij}):[10]

$$PC_{ij} = UV_{ij} - L_{ij}.$$

The ETEs are then calculated, for 106 apparel quota categories and the nine suppliers with license prices, simply as:

$$e_{ij} = L_{ij} / PC_{ij}.$$

Given the high degree of heterogeneity in apparel product and apparel suppliers, the computed ETEs vary greatly across suppliers as well as across quota categories. They are used as a determinant of a country's import market share in the econometric exercises we conduct in section 4. For illustrative purpose, the weighted averages of the computed ETEs for the suppliers with available apparel and textiles license prices are reported in table 2. Even at those highly aggregated sectors, the average ETEs still vary considerably among the nine suppliers. For instance, the ETEs for apparel ranges from around 20 percent for Bangladesh and China, to 0.7 percent for Taiwan. For the five countries with binding textile QRs, the ETEs range from 18 percent for India to 1.4 percent for Taiwan.

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[9] Chinese license prices are from www.chinaquota.com. Those for India and Pakistan were from garments.indiaexcite.com and www.qsc.com.pk, respectively. Those for Bangladesh, Hong Kong, Indonesia, and Macau are listed on www.texwatch.com. Quota prices for Cambodia and Taiwan were collected from home.kimo.com.tw/ctquota/.

[10] F.O.B. unit values, measured in 2002 U.S. dollars are used to proxy for price. They were calculated from U.S. import data provided by USDOC, Office of Textiles and Apparel (OTEXA), available on the internet at www.otexa.ita.doc.gov. The values and quantities of U.S. imports are reported on a "customs value" basis, and are equivalent to the f.o.b. designation for exports.

3. Other factors affecting market shares: Survey Results

While the degree of restrictiveness of the quotas is an important determinant of the likely impact of the removal of the MultiFibre Agreement (MFA) quotas on the patterns of trade, other factors may be as or more important in determining the post-2005 market position of different exporters. To find out what factors specifically affect trade and/or investment, two surveys were carried out among 14 major T&C producers/traders in Hong Kong in January 2000, and February/March 2003 (Spinanger, Vamar, 2003).

The 14 companies approached were asked about the factors influencing their decisions to purchase T&C products and/or establish production facilities in a given country. The companies had activities in Hong Kong, China, throughout Asia and around the world. Some of them were major players, others were medium-size businesses. In all cases, the individuals had senior positions in their firms-- most were owners, CEOs or managing directors. In other words, there are two sets of data reflecting overall trade and investment conditions in 2000 and in 2003 as viewed by almost exactly the same individuals. In all but one case were the individuals contacted in 2003 not the same as those in 2000.

In the survey, they were asked to estimate the relative importance of 18 factors determining where they would buy/source clothes or invest in manufacturing facilities. The factors selected were those usually found in the relevant literature <u>and</u> respondents were requested to give a "gut" reply to each factor by responding with a number **between "10" if a factor was totally and absolutely important, and "1" if it was totally and absolutely unimportant.** The questions asked referred to the factors shown in table 3 (numbered by importance of answers in 2000 and listed in line with average importance in 2000 and 2003).

The overall results of the two surveys are presented in Figures 1 (2000) and 2 (2003); Figure 3 contains an average of the two years.. They clearly portray a world which fits well into the picture of how T&C companies react to quotas and what makes countries competitive. The information provided by the answers to the questions is portrayed in the diagrams by plotting the average rankings (scores) given to each question (on the vertical axis) against the coefficient of variation (on the horizontal axis). The resulting downward sloping pattern reflects those questions with little variation in rankings between companies (*i.e.*, low coefficient of variation) and high average ranking values on the upper left side of the diagram and those answers with a high variation (*i.e.*, high coefficient of variation) on the bottom right, but lower average ranking values on the left.

We want to focus on the questions that received the highest values and had the lowest degree of variance. These are the essential factors shaping investment and sourcing decisions. Figure 3 clearly

reveals three groups of factors, which influence investment and sourcing decisions. The top group, with the highest rankings and lowest coefficients of variation contained the following factors.

Business considered **politics and stability in the host country (1)** as the most important factor influencing investment and sourcing decisions. This requirement has also been shown to be crucial in numerous other studies and is definitely not restricted to the T&C industry. It should conceivably be possible to impute the costs of instability by comparing two different sets of countries. This factor has also been stressed by Tait (2002) who argued that purchasers are likely to concentrate on four or five politically and financially stable countries which satisfy conditions like respect of basic human ethics such as minimum wages; absence of child or forced labor; and good working conditions.

That the **quality of transportation infrastructure (3)** is now second in the order reflects the increasing importance of time in getting inputs into a country and outputs quickly to the final buyer. This is all the more important to know that each additional day in transport is equivalent to an extra 0.8 percentage point increase in applied tariff rates (Hummels, 2001). Hence, an extra 10 days of goods lying around in harbors, waiting to be unloaded and processed adds (given prevailing tariff rates), at least an additional eight percent to products being further exported–and this could well be that amount, which decides over the competitiveness of a company and hence of a country vying for investments or for demand for its goods. As noted by Limao and Venables (p.24) "a deterioration of infrastructure from the median to the 75th percentile raises transport costs by 12% points and reduces traded volumes by 28%."

The third most important key factor deals with **policies affecting trade and investment (5)**. In essence this could be conceived as those policies, which are deemed as conforming to liberal WTO rules and are aimed at keeping the economy open and relatively free from distortions. Numerous studies have underlined the gains in welfare which can be achieved by ensuring that price distortions are eliminated. Spinanger(1991), for instance, showed the developing countries with low levels of distortions in the period 80/85 exhibited export growth rates over five percentage points higher than those with high levels of distortions (+4.8% vs. –0.5%).

Close behind was the factor **quality of telecom infrastructure (4)** in the host country, which complements the transportation infrastructure, and is generally mentioned in numerous other surveys of factors essential for attracting foreign investments. As shown by Fink (p.19), et al, "by incorporating alternative measures of communication costs in a standard model of bilateral trade…[it could be shown]…that international variations in communication costs were shown to have a significant influence on trade patterns…particularly on differentiated products."

The next factor – **labor costs (6)** – should be expected to be crucial in the case of such a labor-intensive industry such as clothing. However, the fact that it is not given a higher rating points to statements underlined by numerous interviewees, namely that in many cases higher labor costs can be easily accepted if they are accordingly compensated for by other factors.

The next factor – **policies affecting labor, health and environment (8)** – has become more important recently, particularly as a result of government and NGO controls to ensure that certain standards are upheld. That this factor has become more important over time shows how well the survey actually picked up activity of the NGOs, international organizations and the increased awareness of corporations with respect to goverance.

The final factor in the top group--**lack of restrictions on capital/profit transactions (10)--**is crucial if such ventures are to produce returns. With countries trying all the harder these days to solve fiscal problems, it has become all the more essential to ensure that such barriers are dealt with openly and up front.

Obviously *availability of quotas* (number 2) are not of importance in the year 2003, with their elimination occurring at the end of 2004. Here again the survey correctly reflected the change in conditions over the three year period. This lends credence to using the above information to analyse what is actually going on out in the real world. Of the remaining factors, it can probably be contended that factors 11 through 18 can be generally considered as not being highly relevant with respect to influencing investment/sourcing decisions. It is particularly interesting to note that the existence of an Overseas Chinese Community is not a relevant factor in influencing the choice of investment and sourcing decisions. This is positive in particular for South Asian countries in the sense that it means that the negligible presence of ethnic Chinese in the region do not hinder their chances in profiting from FDI or sourcing contracts from Hong Kong Chinese.

4. Analytical model

The model presented here is a simple variant of the Krugman intra-industry trade model. The differentiated-product features of the model makes it very useful and convenient in studying the import shares of different apparel suppliers to the United States market. The model is characterized by increasing returns and imperfect competition which are very attractive aspects given the importance of scale economies in the clothing sector.

Demand Side

The social utility function in the United States is assumed to have the CES form:

$$(1) \qquad U = [\sum_{i=1}^{N} C_i^{(s-1)/s}]^{s/(s-1)}, s > 1,$$

where N is the number of varieties of the differentiated good (identified at the MFA quota category) available to the consumer, C_i is the U.S. consumption of the i-th differentiated good and, s is the elasticity of substitution between any two varieties. For simplicity, it is assumed that each of the N varieties is produced by a single firm in N different countries (i.e., there are N exporting country suppliers).

Utility is maximized subject to the budget constraint, $\sum_{i=1}^{N} P_i C_i = Y$ where P_i is the domestic price i-th differentiated good, and Y is the U.S. national income. Utility maximization yields the U.S.'s demand function for typical variety i which is given by:

$$(2) \qquad C_i = (\frac{P_i}{P})^{-s} Y, \quad P = [\sum_{j=1}^{N} (P_j)^{1-s}]^{-1/s} .$$

P can be thought of as an index of the U.S. price level for the differentiated good.

Supply Side

On the supply side, assume that a firm produces apparel or textile products using a composite input denoted by l_i. For a typical variety i, the composite input requirement is given by:

$$(3) \qquad l_i = a_i + b_i x_i, a_i, b_i > 0,$$

where x_i is the output of variety i, a_i is a fixed cost necessary for any positive amount of production and, b_i denotes the input requirement per unit of output. The two technological parameters are assumed to vary by country. In particular, one can think of b_i as a productivity proxy for the different suppliers. Since it was assumed that there is only one firm in each country producing a single variety, i can also be used to denote both the product variety and the exporting country.

The total cost incurred by the producer in the i-th exporting country is therefore:

$$(4) \qquad TC_i = a_i . W_i + b_i . W_i . x_i,$$

where W_i is the wage rate (or rental rate for the composite input) in country i. In this application, W_i will also be used to denote the general cost of doing business in a particular country. Due to the fixed cost, the production technology exhibits increasing returns to scale.

As was discussed in section 2, an apparel firm in a quota-constrained country has to obtain or buy the right to use the quota (or an export license) in order to be able to export to the United States.[11] The MFA quota can thus be viewed as imposing an implicit tax on exports of textiles and apparel from restrained countries to the United States. Accordingly, we assume that an exporter incurs an additional cost of e_i per unit of export. It should be noted that from another point of view, the limited and scarce supply of export licenses can become very valuable and can significantly benefit firms with access to them: exporters who have licenses to export the products to the United States are able to capture economic rents by increasing the export prices of their products. In this model, this will be reflected by a higher P_i. Given the cost of obtaining the quota, a typical (representative) manufacturer in country i, then, maximizes its operating profit:

$$(5) \qquad \Pi_i = \frac{P_i x_i}{(1+t_i)(1+e_i)(1+r_i)} - a.W_i - b.W_i.x_i,$$

where t_i, r_i are, respectively, the tariff rate and the transport cost facing country i's firm when exporting to the United States. As is common in the literature, it is assumed that there is a large number of varieties/suppliers so that a firm considers s to be the elasticity of demand that it faces (Helpman and Krugman, 1985). The first order condition for the firm is given by:

$$(6) \qquad P_i.(1 - \frac{1}{s}) = b_i.W_i.(1 + t_i)(1 + e_i)(1 + r_i).$$

Assuming that the supplier is small enough and cannot significantly affect the overall price index P in the United States, the volume of apparel exported can be derived using equations (2) and (6):

$$(7) \qquad x_i = (\frac{s\,b_i.W_i.(1 + t_i)(1 + e_i)(1 + r_i)}{(s-1)P})^{-s} Y,$$

which can be characterized by $x_{i_W} < 0, x_{i_t} < 0, x_{i_r} < 0, x_{i_e} < 0$, and $x_{i_P} > 0, x_{i_Y} > 0$. That is, supplier i's production (and export to the United States) responds positively to U.S. national income and U.S. price level, but negatively to production costs, quota costs, transport costs, and U.S. tariffs.

One can think of a situation in which the government agency that administer the quota allocation system anticipates the firm's response to the quota cost, and thus choose e_i in such a way that $x_i = \overline{Q}$, where $\overline{Q}$ is the country's total quota for exporting to the United States. One can easily derive the resulting license price:

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[11] Note that even in countries where quotas are distributed without charge, the exporters must forgo the opportunity to sell the valuable quotas to other suppliers. This could also be viewed as an opportunity cost.

$$(8) \qquad e_i = (\frac{(s-1)P}{s\, b_i.W_i.(1+t_i)(1+r_i)})Y^{1/s}\overline{Q}^{-1/s}-1.$$

which has the following properties: $e_{iW}<0, e_{i_t}<0,\ e_{i_r}<0, e_{i\overline{Q}}<0$, and $e_{iP}>0, e_{iY}>0$. As expected, the license price (or the export tax equivalent of the quota) is a negative function of the quota level, the cost of production and transport, as well as the U.S. import tariffs. On the other hand, it is positively related to U.S. national income and price level.

Market Share

The variable of interest for this application is the share of a given exporting country in the U.S. import market. It is denoted by s_i and is defined as follow:

$$(9) \qquad s_i = \frac{C_i}{\sum\limits_{j=1}^{N} C_j} = \frac{P_i^{-s}}{\sum\limits_{j=1}^{N} P_j^{-s}}.$$

One can then use (6) and rewrite s_i in function of the trading costs and the other characteristics of the exporting countries:

$$(10) \qquad s_i = \frac{[b_i.W_i.(1+t_i)(1+e_i)(1+r_i)]^{-s}}{\tilde{P}}$$

where $\tilde{P} = \sum\limits_{j=1}^{N} P_j^{-s} = \sum\limits_{j=1}^{N}[b_j.W_j.(1+t_j)(1+e_j)(1+r_j)]^{-s}$, which represents a general average measure

of U.S. price for the given product (constant across suppliers). This expression is similar to that derived by Winters and Breton (1993) in their study of the UK's footwear VERs.

5. Data and estimation

Equation (10), derived in the previous section, provides a specification for testing the impact of the QRs and other qualitative factors on a country's share of U.S. imports. For the purpose of our econometric analysis, we manipulate it by taking logs and get a simple linear estimable equation:

$$\ln(s_i) = a_1 + a_1\ln(b_i.W) + a_2\ln(1+t_i) + a_3\ln(1+e_i) + a_4\ln(1+r_i) + a_5\ln(\tilde{P}) \qquad (10)'$$

We collected data for nine countries (Bangladesh, Cambodia, China, Hong Kong, India, Indonesia, Macau, Pakistan, and Taiwan) and for 106 apparel product categories (all cotton, wool, man-made and silk MFA product categories) on share of U.S. imports in 2002. This yields a panel of 730 observations, since some countries do not trade all products. We estimate (10)' using GLS, with a correction for cross-section (groupwise) heteroskedasticity.

Table 4 shows the average values of the data (across all products) for the nine countries in our sample.   Import share is constructed from data on quantity of imports (in SMEs), obtained from the OTEXA website (www.otexa.ita.doc.gov). Data from OTEXA is also used to construct an average unit value for U.S. imports (customs value of imports/quantity of imports in SMEs) for each of the 106 product categories, from all sources. This is used to represent the average price of each apparel import in the U.S. market. The U.S. statutory tariffs on apparel are available at the HS 8-digit level on the USITC Trade Dataweb, in the Tariff Database (www.usitc.gov). A trade-weighted average statutory tariff for each MFA category was derived, using a 2002 OTEXA concordance (HS 10-digit to MFA).   Each exporting country's production costs for each product were proxied by the difference between the unit value (customs value of imports/quantity of imports in SMEs) and the license price.

Data on two measures related to transport costs were obtained from Veson Nautical (http://apps.veson.com/distances/).[12] This website allows calculation of the nautical miles between the exporting and importing country ports, for various shipping routes. More important, it provides the shipping time (in days). Thus, we are able to calculate the number of days it takes to ship products from each of our nine countries to three ports in the United States, including days in the exporting port, days at sea, and days in the importing country port. We chose to proxy transport costs (by country by product) using two alternative measures: shipping days per dollar shipped (days/customs value) and shipping days per unit shipped (days/quantity in SMEs), between the country of origin and Los Angeles.[13]

We were able to include several of the top 6 qualitative factors from the exporter survey in our analysis. The Global Competitiveness Report (www.weforum.org/gcr) and the Economic Freedom of the World report (http://www.freetheworld.com/release.html) ranked six of our nine countries (Bangladesh, China, Hong Kong, India, Indonesia, and Taiwan) according to policies related to trade and investment, policies affecting labor, health and environment, quality of transportation infrastructure and telecommunications infrastructure, and restrictions on capital markets. (We expect to include an index of overall political stability in future analyses.)   The first four of these are rankings between 1 and 80 with 1 being best. The last is ranked on a scale of 1 to 10 with 10 being best. The underlying components of these indices and raw data are included in Appendix A. Table 5 shows the values of the indices used in our analysis.

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[12] We are grateful to Veson Nautical for giving us access to this data for this project.

6. Results

Results for four different specifications of equation (10)', exclusive of any qualitative indices are shown in table 6. Columns (1) and (3) show results with dummies for apparel groups by fiber (cotton, wool, man-made fibers, with silk omitted), but without country fixed effects. Columns (2) and (4) include country fixed effects. What is immediately striking is the impact of the ETE on import share. Although January 2002 saw a significant number of apparel categories freed of restraints, a country's import share is still highly responsive to a change in the ETE. Loosening the QR on a product will reduce the ETE of the license price (*ceteris paribus*). Columns (1) - (4) suggest that the elasticity of import share to the ETE is between -1.5 and -3.9. Thus a percentage point reduction in the ETE would increase a country's import share by between 1.5 and 3.9 percentage points. Since the higher elasticity estimates are drawn from the specifications with better fit (inclusive of fixed effects), they may be a better measure of the impact of removing the QRs.

The results in table 6 suggest that relative reductions in price due to the removal of the QRs in January 2005 will be a major factor in influencing market share. Using the weighted average ETEs shown in table 2, we would anticipate the largest increases in shares (in our sample) accruing to Bangladesh, China, and Hong Kong, followed closely by India, Pakistan and Macau. However, relative production efficiency also has a significant impact on import share at the product level. Results in table 6 suggest that the elasticity of import share with respect to production costs is between -0.4 and -1.1. In addition, shipping costs (per dollar or per unit) are a significant determinant of import share. The elasticity estimates for import share with respect to transport costs are -0.5 to -0.6. An additional two days in transit per dollar (SME) shipped reduces import share by about 1 percentage point.

The qualitative indices which are available differ across countries, but not across apparel products. Thus, we re-estimated (10)' including five qualitative factors, but no country fixed effects. Because these indices are only available for six countries, the sample size is reduced. The results are shown in table 7. We see that the qualitative factors cited by the survey of exporting firms clearly are significant factors in determining import share. Countries with better transport infrastructure (lower values) have significantly higher import shares. This is also true for telecommunications infrastructure, though the results is not statistically significant. Countries with more favorable policies toward health, labor and the environment also have higher shares of the U.S. import market. The two indices which do not behave as expected are Trade and Investment Policies and Restrictions on Capital Markets. Fewer restraints on the capital market (higher values) and better Trade and Investment Policies (lower values)

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[13] Ports of origin for the nine countries are Chittagong, Bangkok (proxy for Macau), Guangzhou, Hong Kong, Mumbai, Jakarta, Karachi, Kaoshiung.

should imply a larger import share. The perverse signs here may be due to the small number of components which make up these two indices (see appendix A).

Another important result is evident in table 7. The inclusion of qualitative indices does not significantly change the importance of the other economic variables which impact import share. In particular, import share is now even more responsive to changes in the ETE than before. These results support the idea that both changes in relative price due to liberation of the QRs and qualitative characteristics of countries will together determine which exporting countries shares grow the most in the new liberated apparel market.

7. Conclusions

This paper uses two novel data sources to estimate the determinants of the shares of various developing countries in total U.S. apparel imports. Using panel data on 9 countries and 106 apparel products in 2002, we test the impact of both changes in the export tax equivalents of the apparel VERs and differences in qualitative characteristics of countries on import shares. We find that the degree of restraint imposed by the quotas is still a critical factor in determining a country's import share in the U.S. market. A percentage point drop in the export tax equivalent of the quota (due to loosening the restraint) would likely increase import share by between 1.5 and 3.9 percentage points. However, lower production costs, lower tariffs and transport costs, better quality of infrastructure and more favorable policies toward health, labor and environment will also play a key role in determining shares of the U.S. import market post 2005.

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Table 1
Suppliers subject to U.S. import quotas on textiles and apparel in 2002: Imports and Import share

Supplier	Imports	Import share	Number of "binding" quota categories[1]
	Million dollars	*Percent*	
China	8,744	12.1	58
Mexico[2]	8,619	11.9	1
Hong Kong	4,032	5.6	26
India	2,993	4.1	18
Korea, Republic of	2,881	4.0	2
Indonesia	2,329	3.2	38
Taiwan	2,208	3.1	10
Thailand	2,204	3.1	16
Dominican Republic	2,173	3.0	
Philippines	2,042	2.8	21
Bangladesh	1,990	2.8	24
Pakistan	1,983	2.7	25
El Salvador	1,709	2.4	
Turkey	1,678	2.3	14
Guatemala	1,669	2.3	1
Sri Lanka	1,527	2.1	19
Macau	1,148	1.6	12
Cambodia	1,061	1.5	13
Malaysia	775	1.1	14
Costa Rica	730	1.0	
Egypt	474	0.7	
Russia	370	0.5	
Colombia	370	0.5	1
Brazil	332	0.5	1
Burma (Myanmar)	310	0.4	2
Singapore[2]	289	0.4	2
United Arab Emirates	281	0.4	4
Bahrain	202	0.3	
Bulgaria	146	0.2	
Nepal	136	0.2	3
Oman	125	0.2	2
Jamaica	125	0.2	
Romania	119	0.2	3
Qatar	102	0.1	2
Ukraine	78	0.1	1
Fiji	75	0.1	
Poland	61	0.1	2
Macedonia	44	0.1	
Belarus	43	0.1	
Hungary	41	0.1	
Kuwait	29	0.0	
Czech Republic	27	0.0	
Uruguay	10	0.0	
Slovak Republic	10	0.0	
Laos	2	0.0	
World	72,183	100.0	

[1] A bolded supplier name indicates that, in 2002, a given supplier had at least one quota category filled at 85 percent or more. Quota utilization rates were from Performance Report, OTEXA, USDOC, July 2003.
[2] The United States eliminated quota restrictions on textile and apparel imports from Singapore and Mexico in 2004..

Source: USITC (2004, Forthcoming) and OTEXA, USDOC.

Table 2
Weighted average ETEs for apparel suppliers with available license prices 2002

Supplier	Average Apparel ETEs	Average Textiles ETEs
	Percent	*Percent*
Bangladesh [1]	21.56	0
China	19.74	9.74
Hong Kong	18.62	1.46
India	12.48	18.42
Pakistan	11.26	11.91
Macau [1]	9.81	0
Indonesia [1]	5.41	0
Cambodia [1]	3.87	0
Taiwan	0.7	1.38

Source: Computed from license prices as described in the text.
[1] This country had no positive license price (no binding constraint) on textile products in 2002.

Table 3
Factors influencing sourcing decisions

 1 Politics and stability in host country
 3 Quality of transportation infrastructure in host country
 5 Policies affecting international trade and investment
 4 Quality of telecom infrastructure in host country
 6 Labour costs
 8 Policies affecting labour, health and environment
 2 Availability of quotas in host country
10 Lack of restrictions on capital/profit transactions
 7 Education and training of workers
 9 Potential for exports to USA
11 The "culture" of host country
14 Host government tax policies/incentives
12 Potential new customers/new markets
13 Potential for exports to EU
15 Availability of ready-made factory units
17 HKG tax policies
16 Potential for exports to region
18 Existence of Overseas Chinese Community

Table 4.
Descriptive Statistics (averages)

Supplier	Shares of US Apparel Imports (percent)	Cost per unit ($/SME)	Average Tariff, Import Weighted (percent)	Shipping Time[1] (days)	Shipping Distance[1] (nautical miles)
Bangladesh	7.91	2.89	15.47	27.1	9123
Cambodia	5.14	4.47	15.96	22.6	8438
China	39.16	6.27	9.87	15	6404
Hong Kong	10.02	7.26	16.44	14.9	6335
India	9.93	5.43	15.35	25	10053
Indonesia	6.46	4.68	17.69	22.5	8135
Macau	2.55	6.22	18.33	27.2	6370
Pakistan	4.83	4.93	16.27	26	10513
Taiwan	7.14	3.95	21.39	14.3	6094

Source: see text
[1]Includes days in port of origin and destination, and days at sea. Shipping routes discussed in text.
Data from Veson Nautical, http://apps.veson.com/distances/ .

Table 5.
Qualitative factors (indices)[1]

Supplier	Trade/Inv. Policies[2]	Lbr/Hlth/ Env. Pol.[2]	Telecom. Infra.[2]	Transport Infra.[2]	Capital Restrictions[3]
Bangladesh	52	52	68	76	2.23
China	49	36	58	54	1.83
Hong Kong	21	19	5	6	9.7
India	47	63	56	56	1.33
Indonesia	64	63	64	61	6.53
Taiwan	27	14	18	22	7.53

Source: Global Competitiveness Report (www.weforum.org/gcr) and Economic Freedom of the World Report
(http://www.freetheworld.com/release.html).
[1] Components of each index may be found in Appendix A.
[2] Countries ranked on a scale of 1 to 80 where 1 is best.
[3] Countries ranked on a scale of 1 to 10 where 10 is best.

Table 6.
The Impact of QRs and Other Factors on Exporters' Shares of U.S. Imports[1]

Variable	(1) Coeff	(1) t-Stat	(2) Coeff	(2) t-Stat	(3) Coeff	(3) t-Stat	(4) Coeff	(4) t-Stat
Constant	-5.64	-27.19	-5.58	-24.59	-5.61	-27.29	-5.55	-24.58
Fiber Dummies[2]								
Cotton Dummy	-0.85	-6.02	-0.51	-3.88	-0.87	-6.22	-0.53	-4.02
Wool Dummy	-0.23	-1.47	-0.26	-1.84	-0.23	-1.48	-0.26	-1.84
MM Fiber Dummy	-0.67	-4.08	-0.58	-3.93	-0.68	-4.21	-0.59	-4.01
Log Costs per unit	-0.99	-14.08	-1.08	-15.25	-0.43	-6.28	-0.57	-8.24
Log ETE	-1.97	-4.93	-3.90	-10.67	-1.50	-3.83	-3.46	-9.48
Log Tariff	-4.19	-4.53	-1.66	-1.95	-4.24	-4.62	-1.75	-2.07
Log World Price	0.83	8.69	0.89	10.00	0.86	9.01	0.91	10.26
Log Days[3] per Dollar Shipped	-0.61	-38.54	-0.54	-33.22				
Log Days per Unit[4] Shipped					-0.61	-38.86	-0.54	-35.37
Country Dummies[5]								
Bangladesh			0.58	3.20			0.56	3.14
Cambodia			-0.28	-1.81			-0.29	-1.87
China			2.06	11.97			2.02	11.70
Hong Kong			0.67	4.35			0.67	4.34
India			0.60	3.61			0.61	3.65
Indonesia			0.51	3.13			0.50	3.06
Macau			0.05	0.32			0.04	0.28
Pakistan			-0.27	-1.42			-0.29	-1.54
R-squared	0.69		0.78		0.69		0.78	
Adjusted R-squared	0.69		0.77		0.69		0.77	
F-statistic	203.25		158.23		206.62		157.69	
Prob(F-statistic)	0.00		0.00		0.00		0.00	
Durbin-Watson stat	1.47		1.67		1.48		1.67	
Observations	730		730		730		730	

[1] GLS estimation with correction for cross-country heteroskedasticity.
[2] Omitted fiber is silk (MFA categories 733 to 759 and 831 to 859).
[3] Shipping days: includes days in home port, at sea and in port of destination. Data from http://apps.veson.com/distances/ .
[4] Units are square meter equivalents.
[5] Omitted country is Taiwan.

Table 7.
The Impact of QRs and Other Factors on Exporters' Shares of U.S. Imports[1]

Variable	(1) Coeff	(1) t-Stat	(2) Coeff	(2) t-Stat
Constant	-13.74	-5.57	-13.18	-5.45
Fiber Dummies[2]				
Cotton Dummy	-0.58	-3.80	-0.60	-3.93
Wool Dummy	-0.22	-1.28	-0.21	-1.27
MM Fiber Dummy	-0.55	-3.22	-0.56	-3.30
Log Costs per unit	-1.17	-14.22	-0.69	-8.56
Log ETE	-3.85	-10.01	-3.42	-8.92
Log Tariff	-2.29	-2.20	-2.45	-2.37
Log World Price	0.99	9.46	1.02	9.73
Log Days[3] per Dollar Shipped	-0.52	-28.49		
Log Days per Unit[4] Shipped			-0.52	-28.74
Qualitative Indices				
Trade/Inv. Policies[5]	8.87	6.18	8.50	6.00
Lbr/Hlth/Env. Pol.[5]	-2.40	-7.75	-2.31	-7.48
Telecom. Infra.[5]	-1.35	-0.89	-1.13	-0.76
Capital Restrictions[6]	-0.47	-8.04	-0.45	-7.87
Transport Infra.[5]	-2.26	-1.99	-2.36	-2.13
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R-squared	0.76		0.76	
Adjusted R-squared	0.76		0.76	
F-statistic	128.31		127.97	
Prob(F-statistic)	0.00		0.00	
Durbin-Watson stat	1.68		1.68	
Observations	532		532	

[1] GLS estimation with correction for cross-country heteroskedasticity.
[2] Omitted fiber is silk (MFA categories 733 to 759 and 831 to 859).
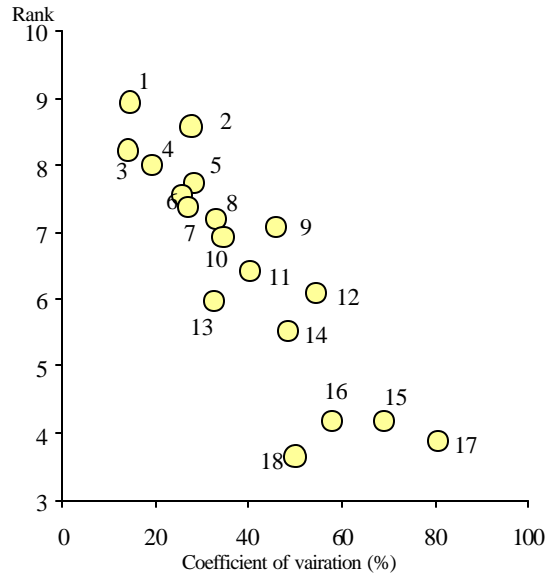[3] Shipping days: includes days in home port, at sea and in port of destination.
  Data from http://apps.veson.com/distances/ .
[4] Units are square meter equivalents.
[5] Countries ranked from 1 to 80, with 1 best.
[6] Countries ranked from 1 to 10, with 10 best.

Figure 1: Ranking of Factors Influencing Investment/Sourcing Decisions: 2000

1 Politics and stability in host country
2 Availability of quotas in host country
3 Quality of transportation infrastructure in host country
4 Quality of telecom infrastructure in host country
5 Policies affecting international trade and investment
6 Labor costs
7 Education and training of workers
8 Policies affecting labor, health and environment
9 Potential for exports to USA
10 Lack of restrictions on capital/profit transactions
11 The "culture" of host country
12 Potential new customers/new markets
13 Potential for exports to EU

14 Host government tax policies/incentives
15 Availability of ready-made factory units
16 Potential for exports to region
17 HKG tax policies
18 Existence of Overseas Chinese Community

Source: Based on interviews with CEOs from 14 textile/clothing companies as well as large trading companies in Hong Kong (01/2000). See also text.

Figure 2: Ranking of Factors Influencing Investment/Sourcing Decisions: 2003
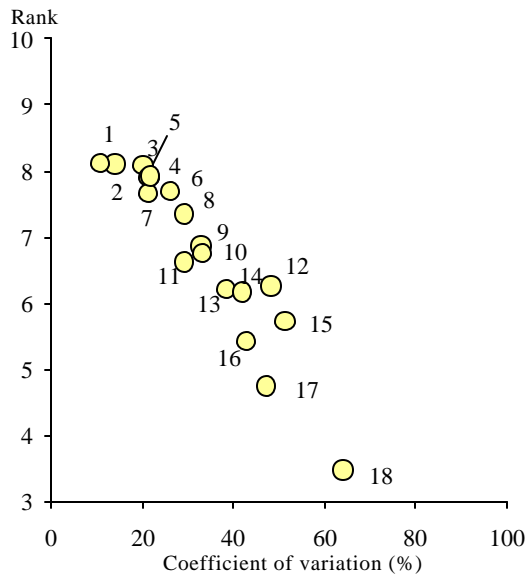
1 Labor costs
2 Policies affecting international trade and investment
3 Politics and stability in host country
4 Policies affecting labor, health and environment
5 Quality of transportation infrastructure in host country
6 Lack of restrictions on capital/profit transactions
7 Quality of telecom infrastructure in host country
8 Host government tax policies/incentives
9 Potential for exports to USA
10 The "culture" of host country
11 Education and training of workers
12 Potential new customers/new markets
13 Availability of quotas in host country
14 Potential for exports to EU
15 HKG tax policies
16 Availability of ready-made factory units
17 Potential for exports to region
18 Existence of Overseas Chinese Community

Source: Based on interviews with CEOs from 14 textile/clothing companies as well as large trading companies in Hong Kong (02/2003). See also text.

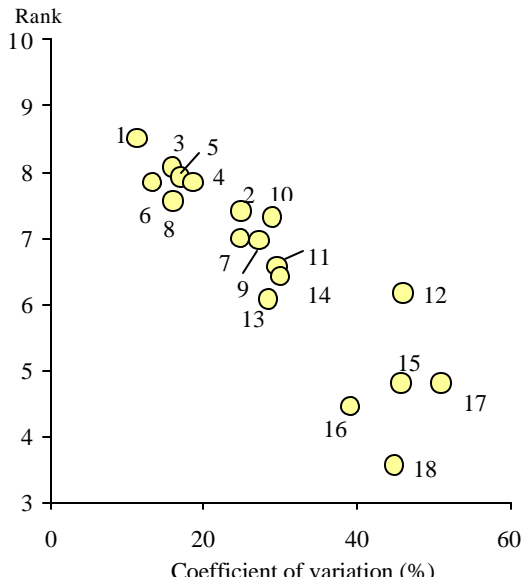**Figure 3:** **Ranking of Factors Influencing Investment/Sourcing Decisions:**
Averages of 2000 and 2003

Rank

1 **Politics and stability in host country**
3 **Quality of transportation infrastructure in host country**
5 **Policies affecting international trade and investment**
4 **Quality of telecom infrastructure in host country**
6 **Labour costs**
8 **Policies affecting labour, health and environment**
2 Availability of quotas in host country
10 **Lack of restrictions on capital/profit transactions**
7 Education and training of workers
9 Potential for exports to USA
11 The "culture" of host country
14 Host government tax policies/incentives
12 Potential new customers/new markets
13 Potential for exports to EU

Coefficient of variation (%)

15 Availability of ready-made factory units
17 HKG tax policies
16 Potential for exports to region
18 Existence of Overseas Chinese Community

Source: See Diagrams 1 and 2 as well as the text.

APPENDIX A: QUALITATIVE INDEX DATA	Source	Bangladesh		China		Hong Kong		India		Indonesia		Taiwan	
		Data	*Rank*	Data	*Rank*	Data	*Rank*	Data	*Rank*	Data	*Rank*	Data	*Rank*
Policies re. Trade + Investment													
2.04 Ease of access to loans	GCP02-03	2.30	*69*	2.50	*60*	4.60	*6*	2.80	*55*	2.40	*63*	3.90	*28*
2.05 Access to credit	GCP02-03	4.00	*49*	4.40	*30*	4.90	*14*	5.20	*5*	2.60	*79*	5.20	*5*
2.09 Regulatory obstacles to business	GCP02-03	4.90	*12*	3.50	*77*	3.40	*78*	4.10	*56*	4.10	*58*	4.30	*48*
2.10 Hidden trade barriers	GCP02-03	3.70	*65*	4.90	*34*	6.30	*3*	4.30	*48*	3.50	*69*	5.10	*30*
2.11 Cost of importing foreign equipment	GCP02-03	3.20	*64*	2.30	*43*	1.30	*4*	3.40	*69*	2.50	*50*	1.70	*23*
AVERAGE RANK			*51.8*		*48.8*		*21.0*		*46.6*		*63.8*		*26.8*
5.C.(v) Irregular Payments of covernment Officials													
2001	EFreedom03	2.50		6.70		8.50		4.30		2.80		7.60	
Policies affecting Labor, Health, and Environment													
10.18 Hiring and firing practices	GCP02-03	4.00	*27*	4.10	*24*	5.70	*1*	2.10	*78*	2.90	*57*	4.70	*10*
10.19 Flexibility of wage determination	GCP02-03	5.10	*34*	5.20	*29*	6.70	*1*	4.10	*61*	4.10	*60*	6.10	*5*
10.20 Cooperation in labor-employer relations	GCP02-03	4.00	*58*	4.70	*32*	5.30	*14*	4.00	*55*	3.50	*74*	5.50	*12*
5.09 Difference in the quality of healthcare	GCP02-03	1.70	*62*	3.70	*31*	5.30	*12*	1.60	*68*	2.20	*52*	5.30	*13*
5.16 health expenditure per capita	GCP02-03	12.00	*74*	40.00	*66*	#N/A	#N/A	#N/A	#N/A	8.00	*75*	650.00	*27*
11.05 Stringency of environment regulations	GCP02-03	2.70	*73*	3.50	*54*	4.00	*43*	3.50	*53*	2.90	*67*	5.20	*21*
11.08 Compliance with international agreements	GCP02-03	3.60	*61*	5.20	*17*	4.40	*42*	3.50	*64*	3.80	*56*	5.40	*16*
11.13 Political context of environment gains	GCP02-03	3.90	*51*	3.60	*64*	4.40	*23*	3.70	*61*	3.50	*73*	4.60	*18*
AVERAGE RANK			*52.2857*		*35.8571*		*19.4286*		*62.8571*		*62.7143*		*13.5714*
Quality transport infra.													
5.01 Overall infrastructure quality	GCP02-03	2.30	*75*	3.40	*52*	5.90	*14*	2.80	*62*	2.80	*64*	5.00	*23*
5.03 Port infrastructure quality	GCP02-03	2.20	*74*	3.80	*44*	6.60	*2*	3.00	*61*	2.90	*64*	5.30	*20*
5.04 Air transport infrastructure quality	GCP02-03	2.80	*78*	3.60	*65*	6.60	*3*	4.80	*45*	4.20	*56*	5.50	*23*
5.10 Paved roads	GCP02-03	9.53	*72*	22.40	*59*	100.00	*1*	45.70	*46*	46.30	*44*	#N/A	#N/A
AVERAGE RANK (exluding paved roads)			*75.6667*		*53.6667*		*6.33333*		*56*		*61.3333*		*22*
Lack of restriction cap/prof. trans.													
3.D. Freedom to Own Foreign Currency													

2001	EFreedom03	0.00		0.00		10.00		0.00		10.00		10.00		
4.E(i) Access to Foreign Capital														
2001	EFreedom03	5.90		4.70		9.90		4.00		8.10		7.60		
4.E(ii) Restrictions of Foreign Capital Transactions														
2001	EFreedom03	0.80		0.80		9.20		0.00		1.50		5.00		*(1995 value)*
AVERAGE RANK		*2.23*		*1.83*		*9.70*		*1.33*		*6.53*		*7.53*		
Quality telecom infra.														
4.01 Availability of mobile or cellular telephones	GCP02-03	5.80	*57*	5.10	*73*	6.90	*5*	6.10	*46*	5.60	*64*	6.30	*37*	
4.03 Quality of competition in the ISP sector	GCP02-03	4.20	*46*	3.70	*57*	6.20	*2*	4.50	*35*	4.20	*43*	5.30	*18*	
4.07 Cellular telephones, 2001	GCP02-03	0.40	*79*	11.17	*60*	85.46	*2*	0.63	*78*	2.47	*74*	96.55	*1*	
4.10 Telephone lines, 2001	GCP02-03	0.39	*80*	13.81	*53*	57.66	*12*	3.38	*75*	3.70	*74*	57.34	*14*	
5.06 Telephone/fax infrastructure quality	GCP02-03	1.80	*78*	5.50	*49*	6.90	*4*	5.60	*47*	4.50	*67*	6.40	*21*	
AVERAGE RANK			*68*		*58.4*		*5*		*56.2*		*64.4*		*18.2*	