When the Floodgates Open: Evidence from the Response of Danish Textile and Apparel Industry to Lifting Trade Restrictions on Chinese Goods

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Abstract

Using the dismantling of the Multi-fibre Arrangement quota system after China's WTO membership, within firms adjustments to intensified low-wage competition is analyzed at employment, investment and product margins. Employing Danish employer-employee matched data supplemented with transaction-level data from between 1995 and 2007, the analysis shows a significant increase in skill and capital intensity associated with downsizing in response to heightened competition. When education levels of employees are analyzed within occupation categories, a disproportionate increase in skill intensity is found to occur in the most basic skill category of jobs. An associated significant increase in average wages of the basic skill category jobs is also documented. Constructing firm-specific and time variable new product introduction measures, firms are found to refocus their innovative efforts away from goods where China's competitive advantage increases as a result of the quota removal. As 'affected' firms are also found to drop their existing products disproportionately, a weakly significant negative effect is found on product scopes. The results support theories that indicate compositional changes in the scopes and operations of Northern firms in response to competition from South.

Keywords: Textile and Clothing Industry, Multi-fibre Arrangement, China, Denmark, Low-Wage Country Competition, Within Firm Adjustments, Product Scopes, Occupation Characteristics

JEL Classification: F14; L25; L60

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1 Introduction

Increased trade relationship between advanced countries and low wage countries is one of the most important consequences of globalization, and has had a profound effect on the business environment of firms. The internal structure changes that firms undertake in order to operate in the new environment has been drawing attention as the macroeconomic shift unfolds, but more empirical insight into within firm changes is needed.[1] One reason for the insufficient empirical insight is a lack of appropriate micro level data which can provide detailed perspective into within firm changes at multiple margins. Another is scarcity of policy experiments that can allow researchers to deduce causal implications.

By making use of the expiration of The Multi-fiber Arrangement (MFA) quotas for China due to its WTO membership, in this paper the impact of competition on firm strategies is analyzed. By providing empirical analysis of changes happening at several margins of adjustment in Danish textile and clothing (T&C) industry, including labor and product-level strategies within firms, the aim is to shed light on the type of restructuring happening in advanced countries' traditionally labor intensive manufacturing sectors faced with the stiff competition from low-wage countries.

The Multi-fiber Arrangement (MFA) regulated world trade in textile and clothing from 1974 until 2005. Under this agreement a large portion of textile and clothing export from low wage developing countries to developed countries was subject to physical quotas. The arrangement basically served the purpose of providing 'temporary' protection for developed country textile and apparel industry against competition from developing country products. The Agreement on Textiles and Clothing under WTO provided a schedule for the gradual dismantling of the MFA quotas in four phases; Jan 1995, Jan 1998, Jan 2002 and Jan 2005. By being outside of the WTO during the 1990s, China did not benefit from the first two phases of quota abolishment. One of the immediate concrete changes that WTO membership brought to China was dismantling of the first three phases of MFA quotas on China in January 2002 and allowing it to benefit from the scheduled last phase in January 2005.

I make use of very detailed employee level data as well as transaction level product data. These data-sets are matched at the firm-level and are combined with more traditional firm-level accounting data. Rather than relying on traditional measures of import competition such as import-penetration rates which suffer from endogeneity issues especially if used at the firm-level, the resulting data-set is used to analyze the response of firms to heightened competition in the context of exogenous changes in the

[1] Many recent studies focus on a relationship between import competition and productivity improvement within firms and plants. Being the measured outcome of a number of changes within firms and plants, these studies do not provide particular insight into the inner workings of the firms and the changes that may or may not result in productivity improvement in response to competition.

MFA quota system due to China's WTO accession.

To do that, first those firms with product portfolios containing products that were subject to MFA quotas before the WTO accession of China are identified. Using the difference in differences approach, I then measure any disproportionate changes in such firms in response to the quota removal experience after controlling for firm-fixed effects and aggregate shocks. Both sales and value-added are found to be significantly and negatively affected by the intensified competition from China. On average, the group of firms that are found to produce goods that were protected by MFA quotas experience 11 % disproportionate decline in their sales and 14 % disproportionate decline in their value-added in comparison to others after 2001.

The negative effect of competition is also manifested in employment. Specifically, employment in full-time units decreases disproportionately after the WTO accession of China, by about 20 %, among firms that were producing MFA quota goods. The impact on the employee head-count, although significant and negative as well, is found to be somewhat smaller in magnitude, indicating that firms also adjust their employment at the hours margin. Still the most important adjustment occurs at the extensive margin (the number of employees). This is probably due to the fact that Denmark has a very low level of employment protection. Studies focusing only on head-count may still miss a substantial part of the adjustment for countries that have higher level of employment protection.

Interestingly, the analysis of employment characteristics also shows that the negative effect of competition on employees depends on the type of occupation. A significant negative effect is documented on employees with occupations that require only basic skills, while no significant impact is found on professional and technical employees. An analysis of education characteristics of employees also shows results in line with the occupational characteristics results. More specifically, after the WTO accession of China, a 24 % disproportionate decline is documented in the number of employees who have at most high school diploma at MFA quota goods manufacturers, when compared to other T&C manufacturing firms. Employees with some college education, on the other hand, are found not to be affected by the competition. As a result, a significant concentration of high-skilled employees is found within affected firms. These findings indicate possible changes in the production strategies of firms, that maybe firms limit their in-house production facilities towards technical and skill intensive products and product developments, while outsourcing or subcontracting less technical parts and operations.

Competition is also found to have a weakly significant positive effect on average wages. When analyzed further, the significant positive effect is found to be due to the significant increase in average wages of the basic-level occupations only (employees with occupations that require basic skills). This is due to the selection effect, that firms lay off less productive/skilled workers first, causing an increase in

the average wages of basic-level employees. Both the analysis on average wages among workers with different educational backgrounds and the analysis on education and experience level within occupations confirm this insight. These results are in line with the general structure of the Danish labor market, which is characterized by liberal rules for firing together with a high degree of unionization resulting in downwardly inflexible wages.[2]

Whether increase in low-wage country imports causes decline in low-skill wages was an important question especially in the context of the significant increase in income inequality observed in the 1990s in many advanced countries, including the US. The question re-gained its importance with intensified Chinese imports especially in developed countries in the wake of its WTO accession. Recent studies show the importance of low-wage country imports in causing reallocation between plants towards more capital-intensive (Bernard, et al. (2006)), knowledge-intensive (Bloom et al. (2011)) or higher value-added (Utar and Ruiz (2011)) establishments. Recently, Autor, et al. (2011) document the labor market outcomes of Chinese imports in the US. They document a significant and negative effect of intensified Chinese imports on manufacturing employment, but no significant effects of Chinese imports on low-skill manufacturing wages. Using the removal of textile and clothing quotas for China due to its WTO membership as a quasi-experiment, the findings presented here on employment and wages support theirs, in that the stiff competition with low-wage countries operates more on the quantity margin within manufacturing sectors.

The impact of import competition is also found to be positive and significant on the capital-labor ratio of firms. This is observed due to the decline in employment levels rather than an increase in capital assets. While the physical assets of firms are not found to be negatively affected by the stiff Chinese competition, intangible assets are. The ratio of intangibles over the total assets is also found to respond negatively to the intensified competition with Chinese products. High-end product images, trademarks, exclusive distribution rights etc. may have been harmed by the surge of significantly cheaper and similar versions (maybe even counterfeit products).[3] These findings may land substance to European industrialists' complaints about the potential competitive harm of the rapid surge of Chinese textile and clothing products.[4]

[2]The Danish labor market model is generally referred as a 'flexicurity model'. It combines flexible hiring and firing with a generous social safety net and an extensive system of labor market activation policies.(Andersen, (2011))

[3]In 2008, about 200 million counterfeit items were detected at the European borders with the majority of cases involving articles of clothing and accessories. Two thirds of the counterfeit products seized at the European border in 2008 were produced in China. (United Nations Office on Drugs and Crime Report, (2010))

[4]The European Commission set up a High Level Group to produce recommendations on the future of textile and clothing industry in Europe in early 2004. The group consists of top decision makers from textile and clothing industry. In 2004, the group's first recommendation to deal with the challenges in the new 'quota-free' system was to increase the

As MFA was a temporary system of protection, the European Commission has held that the textile and clothing industry in Europe can survive the stiff competition with low-wage country imports by concentrating on its strength, mainly on high quality and design oriented products, innovation and superior technology. The Commission advocated policies that encourage research and development (R&D) in the industry such as facilitating the participation of small and medium T&C enterprises in EU funded R&D programs.

The empirical analysis in this study shows that firms facing heightened competition from China under the quota-free environment, increase their new product and variety introductions within categories that are not covered by the quotas. Low-wage competition is also found to trigger product droppings with weakly negative effect on the product scopes. The degree of portfolio diversification is found to decrease among smaller firms as well. The results show that the competition triggers substantial shuffling of the products within firms. While firms' incentive to introduce new products significantly increases with the heightened competition, firms are found to channel their innovative efforts away from the products where China's competitive advantage is now higher.[5]

Import competition may drive innovation if firms find it profitable to escape competition by introducing new products or upgrading already existing products. Many studies document a positive link between productivity and import competition ((Pavcnik (2002), Schmitz (2005), De Loecker (2011), Bloom et al.(2011), Utar and Ruiz (2011)); whether the positive link is at least partially driven by increased intensity of firm-level innovation is an important question. Bloom et al.(2011) find that European firms increase their innovation activities as measured by patent counts and R&D expenditure as a result of intensified competition from China. Utar and Ruiz (2011) find that offshore plants of American companies located in Mexico increase plant efficiencies in response to heightened Chinese competition in the US market and document associated increases in skill intensities and productivity-enhancing production and management techniques.[6] Competition from south could also trigger offshoring basic skill required jobs which can result in increased skill-intensity within firms as in Grossman and Rossi-Hansberg (2008), it can also cause endogenous selection of products within firms as in Bernard, Redding, and Schott (2010). Thoenig and Verdier (2003) show that with an increased threat of imitation by low-

effectiveness of intellectual property rights. (European Commission Documents, (2004).)

[5]These results show that the product mixes of the firms are endogenous and respond to the competition. Hence studies that link import competition to productivity, while fixing the product mix of firms, may produce biased results. See for example De Loecker (2011).

[6]Teshima (2010) also documents an increase in R&D expenditure among a sample of Mexican manufacturing firms in response to tariff decline but without any significant accompanying effect on TFP, while Iacovone et al. (2010) find no effect of Chinese competition on innovative activities of firms including R&D expenditure among Mexican manufacturing firms.

wage countries, firms in developed countries tend to respond by biasing the direction of their innovations towards technologies that are intensive in skilled labor. The present results on the firms' product portfolio strategies, together with the significant concentration of skilled labor found within firms, are in line with the notion of "defensive skill-biased innovation" as introduced by Thoenig and Verdier (2003). Another related study is Thesmar and Thoenig (2000). They develop a model to assess the interaction between organizational choice and the macroeconomy. The model is a Schumpeterian growth model a la Aghion and Howitt (1992) where the creative destruction rate measures the rate of product market instability. Firms' organizations decisions rely on the tradeoff between efficiency and adaptability. The intuition is that firms have to pay high sunk costs to achieve high efficiency by investing in a highly tuned organization, but that such an organization is not adaptable. Conversely a less tuned organization with low (or no) sunk costs, but higher skill level is more adaptable. According to their model, markets with higher creative destruction should exhibit higher share of skilled labor. The findings in this study on the negative effect of competition on intangible assets as well as increased product turnover within firms indicate product instability, or in the Schumpeterian language, the 'creative destruction rate' increases with heightened competition with China. The findings of increased skilled and educated workers within firms due to Chinese competition provide, in a way, empirical support of their theoretical argument.

The rest of the paper is organized as follows: In the next section the data sets used in this study are described. An empirical analysis of the effect of the MFA quota expiration on Danish imports is presented next. In section 4 the empirical model is outlined, and results are interpreted in section 5 followed by conclusions in section 6.

2 Data

For the purpose of this study firm-level data on Danish textile and clothing industry are combined with employer-employee matched data and transaction level data. The data-sets are from Statistics Denmark (Danmarks Statistik). The details of the data-sets and constructing of the matched data-set are explained in the appendix.

The traditional firm-level variables such as labor, total wages, capital assets, investment, total sales, profits, etc.. are from the longitudinal firm accounting data. This data-set is complemented with detailed employee characteristics that are compiled from person-level data (IDA) with matched employer code. Since firm accounting data contains all firms that employ at least 0.5 full-time equivalent labor, and since the person data is comprehensive (covers all people between the ages 15 to 70), we can say

that our main data-set covers all T&C firms in Denmark.[7] The final data-set is comprised of around 1092 unique T&C firms between 1995 and 2007 with 43 % of them in clothing and the rest in textile industry.

Product information of firms is compiled from domestic and international trade data-sets. Domestic data contains 10-digit product-firm-year level domestic firm sales for all firms that have 10 or more employees. The international data-set is compiled from Danish custom records, it contains 8-digit product-firm-destination-year level international transactions for all firms with any size. Since domestic trade data is not available after 2005 and since it does not contain data for firms with less than 10 employees, the product portfolio analysis is based on a sample that consists of 875 firms between 1995 and 2005.

Quota information is reported in the SIGL (Système Intégré de Gestion de Licenses) database which is constructed by the European Commission and is publicly available. The SIGL manages licences for imports of textiles, clothing, footwear and steel to the EU. The textile and clothing license database is classified according to 163 grouped quota categories defined by the EU. These categories are mapped to CN/HS 6 digit products. 97 HS 6-digit product categories are identified as being the subject of 2002 quota abolishment for China (phase I, II, and III). On average these goods constitute about 8 % of the total textile and clothing imports and 7 % of the total textile and clothing export in Denmark during the sample period. 187 HS 6-digit product categories are identified as being the subject of 2005 quota abolishment. On average these 2005 quota goods constitute about 16 % of the total Danish textile and clothing imports and 12 % of the total textile and clothing export.

Those goods that are subject to 2002 quota abolishment for China (phase I-II-III goods) are denoted with $MFAQ2$ while goods that are subject to 2005 quota abolishment for China are denoted with $MFAQ5$. In order to indicate the goods that are subject to quota removal for China starting from 2002 (all four phases), the dummy variable $MFAQ$ is used. Using the domestic and international transaction data firms that produce those HS-6 digit goods that were subject to 2002 and 2005 quota abolishment for China are identified.

2.1 Overview of the Danish Textile and Clothing Industry

Europe's T&C industry is dominated by a large number of small and medium-sized enterprises, with the average company employing 19 employees in 1999 as reported by Stengg (2001). Most companies are

[7] Due to data cleaning procedures some of the very small firms are cleaned out from the final data-set due to the data quality issues.

privately owned, and a few are listed on the stock exchange. Danish T&C resembles overall European T&C industry. As reported in Table A-4 in the Appendix, the average number of employees is found to be 20 during the sample period of 1995-2007. All firms in the sample are private firms and around 26 % of them are proprietorships and 91 % of the firms are single plants on average.[8]

The restructuring in Danish and also in European industry overall has been happening since the 1980s due to increasing competition with low wage countries. From 1980 to 1995 the European textile industry lost 47 % of work places, while the corresponding figure for clothing is 40 % (Stengg (2001)). Similarly over the period 1973 to 2002 the loss of jobs amount to 50000 in the Danish T&C industry (Olsen et al.(2004)). Typical manual processes such as sewing, folding, packing, and cutting have been moved abroad during the period, while more capital intensive processes such as dyeing, printing, weaving, knitting and spinning as well as design, logistics and distribution have remained within Denmark to a large extent (Olsen et al.(2004)).

3 Chinese Imports in Denmark

Imports in textile and clothing from China into Denmark has increased significantly with the WTO membership of China. In order to quantify this, transaction level import data between 1995 and 2007 in those goods that are subject to MFA quotas are aggregated into country (k), product (j) and year (t) level and equation 1 is estimated separately among phase 1 to 3 goods (MFAQ2) and phase 4 goods (MFAQ5) imports. lnX_{kjt} is the variable of interest; unit price and the physical amount respectively. Industry by year fixed effects are included to account for industry specific (textile or apparel) shocks including inflation rates and exchange rate variations especially relevant for the unit prices. $Dum02_t$ and $Dum05_t$ are the time dummies:

$$Dum02_t = 1 \quad \text{if YEAR} \geqslant 2002$$

$$Dum02_t = 0 \qquad otherwise$$

[8]Firm ownership information is available only between 1999 and 2006. So 26% is the average between these years. There is a very little change between the years (min. 25.7%, max. 27.6 %). Single-plant information is based on the whole sample (1995-2007).

similarly,

$$Dum05_t = 1 \quad \text{if YEAR} \geqslant 2005$$
$$Dum05_t = 0 \qquad otherwise$$

.

$$lnX_{kjt} = \alpha_0 + \alpha_1 Dum02_t * China + \sum_{kj} \delta_{kj}^{FP} Country_k * Product_j + \sum_t \delta_{tn}^{YI} Year_t * Industry_n + \epsilon_{kjt} \tag{1}$$

The results, presented in Table 1, indicate that quotas were binding for China as the quantity of imports from China increases substantially with removal of those quotas.[9] As the quota limitation disappears, products imported from China get cheaper as well. Brambilla, et al. (2010) also show similar results regarding the quota removal experience in the US data. Unit prices may decline as a result of a new equilibrium which is reached with no quantity limitation. Part of the unit price decline could also be due to changes in the quality of the products in response to the relaxation of the quota restrictions.

Table 1: MFAQ Imports

	Textile and Apparel Products	Textile and Apparel Products
Panel A: MFAQ2 Products (1995-2007)		
Variables	Log Price	Log Amount
Dum02*China	-0.432^{***}	1.998^{***}
	(0.095)	(0.194)
Year By Industry Fixed Effect	yes	yes
Product (HS6) by Country Fixed Effect	yes	yes
Number of observation	17965	17965
F	11.729	19.140
Panel B: MFAQ5 Products (1995-2007)		
Variables	Log Price	Log Amount
Dum05*China	-0.211^{***}	1.607^{***}
	(0.042)	(0.150)
Year By Industry Fixed Effect	yes	yes
Product (HS6) by Country Fixed Effect	yes	yes
Number of observation	30979	30979
F	17.628	29.590

Robust standard errors are reported in parentheses. They are clustered for each HS 6 digit product categories and country pair. Clustering by only country leads smaller standard errors, and available upon request. Constant is included but not reported. Import data between 1995-2007. The panel A sample only includes products under phase I, II, III categories (MFAQ2); the panel B sample only includes products under the phase IV (MFAQ5).

[9]The European Commission on Trade also reports the percentage utilization of the quotas. Most of the quotas for China has been reported as above 90 percent utilization rates.

While China substantially increases its export to Denmark with cheaper prices, is there a disproportionate decline in import prices of quota categories in comparison to other textile and clothing products? It is possible that China merely replaces other import partners of Denmark from the developing world without significantly affecting the prices and hence without significantly increasing the competition for the Danish producers at home. To see this, import data is aggregated into product-year level and equation 2 is estimated where $MFAQ2_j$ is an indicator variable that takes 1 if product j is one of those products that China experienced quota removal in relation to her export to the EU market in 2002.

$$lnP_{jt} = \alpha_0 + \alpha_1 Dum02_t * MFAQ2_j + \sum_j \delta_j^P Product_j + \sum_t \delta_{tn}^{YI} Year_t * Industry_n + \epsilon_{jt} \qquad (2)$$

lnP_{jt} is the logarithm of the unit price of imported product j at year t. The results presented in Table 2 column (a) indicate that 2002 quota removal is associated with a significant decline (about 24 %) in the unit prices of those goods that have been subject to quota restrictions for China. When the dummy for phase I to IV goods (MFAQ2 and MFAQ5) is included (column b) the interaction variable for the phase IV goods is found to be negative and significant as well.

Notice that cheaper imported goods in the domestic market is not the only way that Chinese competition can affect the Danish producers. Danish manufacturers are also expected to face intensified competition with China in export markets such as other EU countries and the US due to the end of differential treatment of China with its WTO membership.

Table 2: Trade Data (1995-2007): All T&C Imports

Sample	Textile and Apparel Products	
	(a)	(b)
Variables	Log Price	Log Price
$Dum02 * MFAQ2_j$	-0.274^{***}	
	(0.069)	
$Dum02 * MFAQ_j$		-0.105^{**}
		(0.035)
Year By Industry Fixed Effect	yes	yes
Product (HS6) Fixed Effect	yes	yes
Number of observation	10446	10446
Number of Products	901	901
F	11.312	11.333

Robust standard errors are reported in parentheses. They are clustered for each HS 6 digit product categories. Constant is included but not reported. Transaction level import data is between 1995-2007 and it is aggregated into HS6 product categories for each year.

4 Empirical Strategy

The exogenous trade shock due to China's accession to the WTO and the associated T&C quota removal is exploited in the empirical strategy. Since China was already a member of the WTO by the end of 2001; and since the 2005 was the final phase, after 2002 there was no uncertainty regarding the timing or the coverage of the 2005 quota removal.[10] However, from the perspective of the time before China became a WTO member, all firms that produced those goods that were subject to the MFA quotas were 'threatened' by the Chinese competition, and this competition intensified with the WTO membership of China. Note also that although China was in negotiation mainly with the US and the EU for the WTO membership for a long time, there was a great deal of uncertainty regarding the timing of the membership.[11]

Firms that produce goods that were subject to 2002 as well as 2005 quota removal for China are identified using domestic and foreign sales data. The majority of the firms (about 70 percent) that produce MFAQ2 products are also found to produce MFAQ5 products. Since the analysis is at the firm-level, I then construct the group of firms that are threatened by the Chinese competition of from those firms that produce goods which are subject to quota removal (Phase I-IV). The variable $MFAQExported_{it}$ is an indicator variable for those firms that export one or more MFA quota products while the variable $MFAQSold_{it}$ is an indicator for those firms that sell (domestic or foreign) one of those products. By constructing the share of those goods in total firm sales, it is also possible to create a continuous measure of treatment. Continuous measures are denoted with the word 'share' in the respective variable name: e.g. $MFAQShare_{it}$ denotes the share of sales coming from goods that are/were subject to quota restriction for China (MFA goods) in overall sales of firm i at year t. Notice that the discrete treatment would be more appropriate when we analyze the impact of competition on strategic decision changes of firms such as upgrading or innovation. However, continuous treatment may well be a good measure for cases when we analyze the impact of competition on the size, profits, and markups. So I use both measures of treatment as appropriate. The second difference is the time when China became the WTO

[10] Due to excessive surge of Chinese imports in the first few months of 2005 at the EU ports in response to the final phase of the quota removal, the EU has re-negotiated the quotas with China and they agreed on additional export quotas (governed by the Chinese government) on certain T&C categories until 2008. Those categories as provided by the European Commission are excluded from the MFAQ5 group. This event is popularly referred and publicized as "Bra War".

[11] "Chinas entry into the WTO is far from a foregone conclusion. It has been trying to join the multilateral trading system since 1986. Its hopes have been disappointed many times before."–quoted from the article called "China and WTO" published in the Economist in April 1, 1999. The main message conveyed in articles about the negotiations published in the Economist between 1999 until 2002, contained this uncertainty. See also The Economist (2000a) and The Economist (2000b).

member.

As time goes by, some of the firms that produce the MFA goods will respond to the fierce Chinese competition by dropping products with a high level of Chinese comparative advantage. Firms which will continue to produce such goods will be ones that are stronger/more competitive and probably bigger, who are able to differentiate themselves. This leads to endogeneity bias. To prevent that, the treatment group is set as those firms that are found to produce those goods that have been protected by MFA quota from China in 1999 before China's WTO membership. Respective dummy variables are indicated by dropping the t subscript and adding 99 at the end of the variable name, e.g. $MFAQSold99_i$ is the dummy variable that takes 1 if the firm i is found to produce any MFA goods in 1999. Note also that the analysis is done among T&C manufacturers so the MFAQSold dummy will not capture trade firms with these products in their portfolio.

5 Firm-level Analysis

By exploiting the exogenous shocks to the competitive environment, the two main regressions that are used to understand the response of firms to the competition are as follows.

$$X_{it} = \alpha_0 + \alpha_1 * MFAQSold99_i * Dum02_t + \sum_i \delta_f^F Firm_i + \sum_t \delta_t^Y Year_t + \epsilon_{it} \tag{3}$$

$$X_{it} = \alpha_0 + \alpha_1 * MFAQShare99_i * Dum02_t + \sum_i \delta_f^F Firm_i + \sum_t \delta_t^Y Year_t + \epsilon_{it} \tag{4}$$

As defined earlier, $MFAQSold99_i$ is the indicator variable for the group of firms that produce MFA quota goods in 1999, $MFAQShare99_i$ is the share of sales for the MFA quota goods in year 1999 and X is the variable of interest.[12] By interacting with the WTO time dummy, the purpose is to capture the response of firms to the competition. I control for the aggregate trends in the industry by using year fixed effects. It is possible that firms found to produce the MFA quota goods are systematically different than the rest of the firms. The panel aspect of the data-set also allows for control of the firm fixed effects that can be correlated with the regressors and thus further help to reduce the endogeneity concerns in the empirical analysis.

[12] 'Treated' firms are identified using domestic and export trade data. There is no size restriction for the record of export transactions; but only those firms with 10 or more employee are included in the domestic trade data. So we may be missing very small firms in our treatment group but this should affect our estimates downwards.

5.1 The Impact of Competition on Sales

The first order effect of competition must be on sales and value-added. Table 3 presents the results for the estimation of equations 3 and 4 where the dependent variables are the logarithm of firm turnover (sales), the logarithm of value added and the logarithm of profit respectively in columns (a), (b) and (c).[13] As expected, competition from China is found to have significantly negative effects on these variables. The significance is higher when we use MFAShare instead of the dummy variable; while the intensity of sales from MFA products increases, the extent of decline on firms' sales is found to be higher naturally. On average, the group of firms that are found to produce MFA quota goods experience an 11 % disproportionate decline in their sales after 2001 in comparison to others. The impact is higher on value-added, with a 14 % disproportionate decline. The difference between the magnitudes of the impact on sales and value-added can indicate a possible increase in production fragmentation, since competition may lead firms to move part of the production processes out of the firm. But the difference can also be due to decline in markups. The results in column (c) in panel B indicate a weakly negative effect of competition on firms' profits. Notice that some firms switch from positive to negative profits, and due to the logarithm transformation we loose this information.

5.2 The Impact of Competition on Employment

Table 4 presents the results for the impact of competition on the level of employment. In the top panel of Table 4, the specification with the discrete indicator variable as specified in equation 3 is presented, while the bottom panel of Table 4 presents the estimation results of equation 4. In column a, the dependent variable is the full-time equivalent number of employment (in logarithm) , while in column b, the dependent variable is the logarithm of the number of employees that are on the payroll and actively work. The coefficients indicate a significant and negative employment impact of the removal of MFA quotas on Danish T&C industry. Focusing on the top panel, the coefficient in column (a) indicates that employment in full-time units decreases disproportionately after the WTO accession of China, by about 20 %, among firms that are found to produce MFA quota goods in 1999. The respective coefficient in column (b) is also negative and significant, but smaller in magnitude, indicating an about 17 % disproportionate decline. The differences in magnitudes in the coefficients indicate that the adjustment is both made at the extensive margin as firms fire employees but also at the intensive margin by decreasing the hours of work.

[13]Information is collected as part of the accounting statistics. Profit is before tax profit. Value-added information is derived by the author using the following formula: [turnover+work performed for own purposes and capitalized+(end of year inventory-beginning inventory)-[purchase of raw materials + energy + subcontracting expenses]

Since the employment is expected to respond to the competition in a continuous manner, the cross-sectional differences in intensities can provide an additional source of identification in equation 4. The results with the continuous version of the treatment group presented at the bottom panel of Table 4 confirm this.

5.2.1 Occupation and Education Characteristics

The analysis so far shows that intensified competition with China triggered by the MFA quota removal causes firms to decrease their level of employment together with their sales. Does the competition affect everybody's likelihood of loosing his/her job in the same way? Recently Bloom et al. (2011) find that the Chinese competition is associated with an increase in IT intensity and patent counts among a sample of European manufacturers. If the competition causes upgrading, or if firms outsource more and concentrate on certain types of production activities, one expects to see traces of these possible strategy changes in a detailed employment analysis. Theoretically both Thoenig and Verdier (2003) and Thesmar and Thoenig (2000) show that increased competition can lead to a change in within firm organization that biasses towards skilled labor. Thus the differential impact of competition across different types of occupations and employees with different education levels are investigated next.

In Table 5 the results on occupation characteristics are presented.[14] The dependent variable in column a is the logarithm of the number of employees who work in jobs that require no specific skill (such as in cleaning services, transportation services, guard services) or basic skill jobs (such as machine operators in the production facility). The coefficient is found to be negative and significant at the 1 percent level. The dependent variable in column b is the logarithm of the number of employees who work in jobs that require basic skills only. The coefficient is negative and significant at the 1 percent level with even larger magnitude than the corresponding coefficient in column a, indicating an about 27 % decline in the number of employees who occupy jobs that require basic level skills. In column c, the dependent variable is the logarithm of the number of employees in jobs that require professional and technical skills. The coefficient in column c is found to be negative and insignificant and the respective coefficient in Panel B is found to be positive and insignificant. These findings indicate that Chinese competition in the Danish T&C industry hits the basic-level employees such as production workers heavily while

[14]The labour data set (IDA) contains information on the major categorization of the positions that the person holds within a firm. The Danish statistics created the Danish version of the ISCO-88, called DISCO-88 in 1996 to replace the previous categorization. So there is a discontinuity between the codes between pre and post 1996 data. Hence the sample starts with 1996 for this analysis. See the appendix for more details. Note also that, due to missing information or other reasons, part of the employees are not assigned to any occupation group, and they are classified under the 'unspecified employees' group. The analysis in Table 5 excludes them.

the amount of professional and technical employees seems mostly not to be affected. We thus find an asymmetric impact of competition from a low-wage country on different types of employees.

The impact of low-wage country competition on full-time equivalent employment, the number of employees, the number of employees with no or basic skill occupations, and the number of employees with professional and technical occupations is also analyzed by quantifying year by year changes. Since the sample starts in year 1995, the treated variable in this analysis is taken as those firms with product portfolios containing goods protected from Chinese competition by MFA in 1995. The results presented in Table A-1 in Appendix are robust.

These results may indicate a possible change in the structure of the production within firms. Firms may decrease their production activities on more standard goods while they outsource more and focus on non-production activities such as technical designs, product developments and marketing. This type of structural change should manifest itself in the educational backgrounds of the employees as well.

In Table 6 in column (a), the dependent variable is the 1 plus the number of employees in a firm who has at least some college level education (logarithm).[15] The coefficient is found to be positive but not significant indicating no significant impact of competition on employees with at least some college schooling. In column b, the dependent variable is the logarithm of 1 plus the number of employees in a firm who has at most some high school diploma.[16] The respective difference in difference coefficient is found to be negative and significant at the 1 percent level. The magnitude indicates an about 24 % disproportionate decline after the WTO accession of China in less educated employees of firms that manufacture MFA quota goods compared to other firms. The results are also robust to using MFAShare as presented in Table 6.

In Table 7 the results with skill-intensity measures are presented. In column (a), the dependent variable is the logarithm of the number of college educated people over the total number of employees in a given firm. Both with the indicator variable showing whether a firm has produced any good protected by Chinese imports under MFA in 1999 and with the variable indicating share of those goods in total sales in 1999, the difference in difference coefficients are found to be positive and significant. The magnitude of the coefficient in the top panel indicates a 26 percent or an about 4 percentage point disproportionate increase in the share of college educated employees. In column (b), the dependent variable is the logarithm of the number of people with at most high school diploma over the total

[15]The educational backgrounds of the employees are derived from the 8-digit code variable that shows the highest completed education of the person. Since this code is not available in 2007, year 2007 data are not used in the analysis that involves education characteristics. See the appendix for the details on this code and related variables.

[16]In Denmark, a high school diploma requires 12 years of schooling after pre-school education.

number of employees in a given firm. The coefficient of difference in difference estimate in the top panel is found to be negative and significant at the 1 percent level, the magnitude indicates an 11 percent or an about 5.7 percentage point decline in the share of high school (or less) educated employees due to Chinese competition. Lastly, in column (c), the dependent variable is the logarithm of the wage share of college educated employees, and the coefficients in both panels are found to be positive and significant. The magnitude of the coefficient in the top panel indicates a 15 percent or an about 2.5 percentage point disproportionate increase in the share of college educated people in firms that are directly affected by the intensified Chinese competition. Together with previous results, these results indicate that the competition causes a significant increase in the average education level of employees within firms as firms shrink and lay off only employees that have lower education levels who are mostly employed in jobs requiring only basic skills.

5.2.2 Wages

In Table 8, the results for the impact of competition on wages are presented. The dependent variable in column (a) is the logarithm of average wage among all employees. The coefficient in column (a) is found to be positive and significant at the 10 % level, indicating that the competition with a low wage country has on average positive effect on within firm wages. The dependent variables in columns (b) and (c) are the logarithms of average wages among basic skills occupations and professional and technical occupations respectively. The results give a better idea about the sources of the positive wage effect. Competition from China is found to have significant positive effect on the basic skill required occupation wages with no significant effect on wages of professional and technical occupations. Although this seems at first odd (assuming imperfectly elastic labor supply, competition from low-wage countries is expected to have the opposite effect on wages of unskilled workers according to trade theory), if base-level employees are the ones most likely to loose their jobs -as found in Table 5- it could be the selection effect that the low end of the productivity distribution, and so the wage distribution, leave the firms first. Another possibility is that if the competition triggers offshoring of basic-level jobs, offshoring, as shown in Grossman and Rossi-Hansberg (2008), can derive an increase in the productivity of low-skill jobs at home, which in return cause an increase in real wages. The previous analysis (results on Tables 5 and 7) is in line with the selection hypothesis, as a significant increase is found in the concentration of highly educated employees within firms.

In columns (d) and (e) average wages of workers across different educational backgrounds are analyzed. The average wages of workers with at most a high school diploma is not found to be significantly affected by the competition. Wages of workers with at least some college education are not found to be

affected by the competition with China either. [17] These results support the notion that the positive effect on wages of blue collar workers (basic skill occupations) is due to selection effects. To further confirm, an analysis of the education backgrounds and experience levels within occupation groups is presented in Table A-2 in the appendix. The results show clearly that average education level as well as average experience increases significantly within basic skill required jobs. In general, the finding that competition with low wage locations leads to an adjustment at the quantity margin rather than adjustment on the wages within manufacturing is in line with the general structure of the Danish labor market with low cost of hiring and firing for firms. The finding that increased average education and experience level is especially relevant within basic skill required jobs can indicate decentralization of authority in accordance with 'lean production' principles. Caroli and Van Reenen (2001) argue that organizational change should be followed by a declining demand for a less skilled labor and that new organizational structure often involve decentralization of authority. The results here are in line with the hypothesis that increased trade with China induces organizational changes that involve further decentralization.

5.3 The Impact of Competition on the Structure and Intensity of Capital

Table 9 presents the results for the estimation of equations 3 and 4 when the dependent variables are logarithm of capital, logarithm of investment and logarithm of capital per labor.[18] Although the value of capital assets are not found to be significantly affected by the competition, competition is found to have significant and negative impact on investment. This is probably due to the possible sensitivity of investments on cash flows of firms which may be a result of imperfect financial markets. The competition with China in the T&C industry is also found to cause an increase in the capital labor ratio; this is due to the decline in labor rather than an increase in the capital assets as suggested by the results in column (a) of Table 9 and in Table 4.

One of the main arguments of European T&C industrialists over the surge of Chinese imports was the harm from those products to the value of 'high end' product images by providing closely similar products with significantly cheaper price. While this type of harm would not show up in physical assets, it may have an effect on firms' intangible assets. The dependent variable in column (a) is the natural

[17] Hummels et al. (2010) use the same data-sets but focus on a sample of bigger Danish manufacturers across all manufacturing industries and they find a positive association between firms' own import intensity and wages of college educated employees. Unlike this study their analysis is not based on exogenous changes in import policy.

[18] Capital assets include the value of plants, machinery and other technical installations, lands, buildings, furniture and office equipment.

logarithm of intangible assets.[19] The results at the top panel indicates a weakly negative impact of competition on intangible assets. Similarly, in column b, the dependent variable is a measure of firm scale as defined by the logit transformation of the ratio of intangible assets over the total assets. The result indicates a weakly negative effect of competition from China on firm scale. These results could be due to a decrease in the value of trademarks and licenses as cheaper and similar products (and maybe imitations) from China penetrate the markets. The results in Panel B shows no significant effect when using the continuous measure of competition. It is likely that the impact on actual values of licenses, trademarks occurs after Chinese products penetrated the market. So if we restrict our attention to 2002 quota removal experience, we may find a stronger effect. To that end, in Panel C, the competition proxy is taken as the share of goods that were subject to 2002 quota removal for China and the results confirm this insight. Note that penetration of the cheaper products in the market may also affect firms' innovative activities in those goods. This is investigated in the next section.

5.4 The Impact of Competition on Product Portfolio

In this section, the impact of competition on firms' incentive to introduce new products, to drop existing products, and on product portfolio strategies is investigated. In this analysis, the availability of the transaction data allows me to construct an objective and time varying measure for firms' innovative activities, which is the number of new products.[20]

Product classifications are firm-specific and they are defined using export data between 1993 and 2007 combined with domestic trade data between 1995 and 2005. New products are defined as products that were not produced by the firm in previous years. If the firm appears in the data-set the first time, then this variable is not defined. Similarly dropped products are defined as products that were not produced in future years, and it is not defined if the firm appears in the data set the last time.[21] New products and dropped products are defined in both 6-digit HS categories and in 8-digit CN categories. In the analysis, the sample is restricted until 2005 as it is the last year of the domestic trade data. Since only one year is captured for the 2005 quota removal experience and since dropped products will

[19] Intangible assets are assets intended for long term ownership or use by the company. Intangible asset information is collected as part of the accounting statistics. It includes licenses, trademarks, copyrights, exclusive distribution rights, software, goodwill, etc.

[20] Previous literature on product innovation is mostly based on patent counts or innovation surveys. The problem with the former is that they only cover innovations that are sufficiently new and evaluated as 'worth to be patented' by the applicant and that they may never be introduced on the market. The latter on the other hand are mainly subjective in nature and depend on the personal judgements of respondents. (Mairesse and Mohnen (2010))

[21] Note that the possible time trends due to the construction of the variables are controlled for using time fixed effects in the empirical analysis.

be undefined in 2005 for firms that do not export, we further restrict the attention to the 2002 quota removal experience.[22]

5.4.1 New Product Introductions

The analysis of the introduction of new products is presented in Table 11. Since the likelihood of introducing new products, new varieties or dropping products is expected to increase as the firms get larger, size quintiles, where the size is measured as the number of products, are controlled for in these regressions. In column (a) the dependent variable is the 1 plus the logarithm of the number of new 6 digit HS products.[23] The difference in difference coefficient is found to be positive but insignificant, indicating no statistically significant effect of competition on the introduction of new products at the HS-6 level on average. As the product definition gets broader, 'new to firm' products may miss variety introductions so as to upgrade or diversify the product portfolio. So the same analysis is also done with 8-digit CN classification and presented in column b. The difference in difference coefficient is positive and significant at the 10 percent level, indicating that firms that are threatened by Chinese competition have an about 17 percent disproportionate increase in the number of new 8-digit products introduced after China's accession of WTO. While the results with narrower product definition in column (b) will capture upgrading or diversification efforts as well, it may still be worthwhile to check the impact of low-wage competition on firms' incentive to introduce new varieties separately. A new variety is defined as a new 8-digit product within the same 6-digit product category. If a firm introduces a new 8 digit product, and the firm has produced similar products before (sharing the same first 6-digit), this is called as an introduction of a new variety. The difference in difference coefficient is positive and significant at the 5 percent level, indicating that firms that are affected by the 2002 quota removal experience have an about 22 percent disproportionate increase in the number of new varieties introduced after China's accession to WTO.

[22]The results are robust to excluding 2005, basing product classification only on the export transactions data, and taking the treatment to those firms that only export. They are available upon request. We provide the results when the treatment group also includes firms that produce goods that are subject to 2005 quota removal in the appendix. Most of the results carry over except that the statistical significance of results of new HS6 products disappears. Unfortunately, we do not have a longer sample to investigate the impact of 2005 quota removal experience on product innovation further.

[23]Because of the zeros when taking logarithms the transformation $1 + NewProducts_{it}$ is used where $NewProducts_{it}$ is the number of product introduction by firm i at year t. The addition of unity is arbitrary, but equal to the sample mean of the counts. Similar transformations are used for other count data variables with presence of zeros, e.g. the number of new varieties, or dropped products. An alternative approach is to use the count data without any transformation and use a non-linear estimator such as a negative binomial model to account for the over dispersion. The results are robust to using a fixed effect negative binomial model, and the respective coefficients are provided in the tablenotes.

The threatened group are those firms that have MFA quota products (phases I-II-III) in their product portfolio in 1999. So one expects that their innovation activities are negatively affected among MFA quota categories due to Schumpeterian forces. However, as argued in Bloom et al. (2011), competition with China can trigger innovative activities of firms towards goods where China's comparative advantages are lower. The two opposing forces may hide the real effect of the competition. To that regard new product and variety introductions among non-MFA quota categories are investigated separately in Panel B of Table 11.[24]

In column (a) at the HS-6 level, the interaction coefficient is found to be positive and significant. It indicates that the treated firms increase their new product introductions in non-quota categories faster than the other firms in the quota-free environment. Similarly, results in column (b) indicates that threatened firms increase their new product introductions at the CN-8 digit level among the non-MFA categories disproportionately by around 24 % . The introduction of new varieties or modifications is also found to be positive and significant when the dependent variable is defined only among non-MFA categories. These results are in line with Arrowian theories that propose a positive relationship between competition and innovation.[25] In columns (a) and (b), the magnitude differences in the respective coefficients between Panel A and B as well as the results with new product introductions among MFA quota products, that are presented in Table A-3 in the appendix, indicate that competition generally discourages innovative activities among MFA categories now facing the stiff competition, confirming the Schumpeterian insight. However, note that when the dependent variable is a new *variety*, the magnitude of the difference-in-difference coefficient gets smaller in Panel B. So while firms may be discouraged to innovate among categories with higher competitive threat, to some extent they may still find themselves competitive enough in some of their MFA goods to introduce varieties in an effort to diversify themselves.

The analysis thus shows that the Danish manufacturers increase their new product introductions, and new varieties in response to the intensified low-wage competition. However, Schumpeterian forces are also found active such that the manufacturers decrease their innovative activities among the affected goods.

[24] The results on the new product introductions among MFA categories are provided in the appendix in Table A-3.

[25] Arrow (1962) emphasizes the importance of the market size effect in firms' incentive to innovate that for a monopolist, innovation simply replaces one profitable investment with another, and this raises the opportunity cost of innovating, something that Arrow called the replacement effect. See for example, Schmidt (1997), Aghion et al.'s (2005) escape competition, Bloom, et al. (2010), which all share the basic insight of Arrow (1962).

5.4.2 Product Scopes

The analysis on labor and sales shows that firms scale down or contract as a results of the competition. If firms concentrate on certain products as a result, depending on the nature of the cost structure, this may be a potential source of efficiency gain.

The analysis of product droppings is presented in Table 12. In column (a) of Table 12 the dependent variable is the logarithm of the number of 6-digit dropped products plus 1. The difference in difference coefficient is positive and significant at the 1 percent level. The results are also robust to the narrower product definition as shown in column (b). Note that the impact of the low-wage competition is also found to be positive on the new product introductions. As firms start introducing new products the likelihood of their product droppings is also expected to increase, since some of their introductions will probably not be successful. So we analyze the impact of competition on firms' incentive to drop existing product lines in column (c) and (d) of Table 12. The results confirm that firms drop some of their product lines in response to the Chinese competition.

Competition can increase the product shuffling without necessarily affecting the scope, as firms can replace the dropped products by adding products whether new or not. Analysis on the product scope presented in column (a) of Table 13 shows that there is a weakly negative effect on the overall scope of the firms. While the competition triggers significant shuffling of the products with the new product introductions and droppings, the net effect is found to be negative. The results presented in column (b) indicate that competition in the export markets is an important dimension of the Chinese competition as the disproportionate decline in the number of exported products is found to be even bigger than the decline in the total number of products. In columns (c) and (d), we can see the impact of competition on the number of products and the number of exported products separately for different size firms. While the first three quartiles of affected firms respond to competition with a decline in their number of products, the 4th quartile respond to it by increasing the number of products.

Competition can also affect firms' portfolio concentration. Lelarge and Nefussi (2010) argue that as firms from developed countries try to escape the competition with low-wage countries, it may be beneficial for them to introduce new products rather than investing in the process innovation to cut the production costs. This is because engaging in competition on the production cost dimension is not likely to be their comparative advantage. On the other hand, they may choose to engage in process innovation in response to the high-wage country competition. However, this idea does not necessarily imply an increase in the diversification in response to the low-wage competition, as firms may choose to innovate in selective sets of goods while they drop some of their existing products that are under threat, as found

in this analysis.

In order to check whether the weakly negative effect found on the product scopes is associated with a higher degree of portfolio concentration, a portfolio concentration index denoted by CI and a diversification index, denoted by DIV are defined as follows:[26]

$$CI_{it} = max_j\{Sh_{ijt}\}$$

where

$$Sh_{ijt} = \frac{Sales_{ijt}}{\sum_j Sales_{ijt}}$$

and

$$DIV_{it} = (\sum_j Sh_{ijt}^2)^{-1}$$

As defined before, i denotes firm, j denotes product and t denotes time(year). The concentration index changes between zero and 1 while the diversification index, which is defined as the inverse of the Herfindahl-Hirschman index of the product concentration, is bounded below by 1 and above by positive infinity. Since 6 or 8 digits may have been too narrow to define an appropriate market, product j is defined as a 4-digit HS category in calculating these measures.

Table 14 presents the results. The coefficient in column a is found to be negative but insignificant, while the coefficient in column b is found to be positive and weakly significant. So the analysis shows a slight decline of the firms' product diversification on average. However, when the treatment group is categorized in terms of different size quartiles as presented in columns c and d of Table 14, the results indicate that firms with a smaller number of products decrease their diversification quite significantly while the degree of diversification of those firms located at the top quartile does not seem to be affected by the competition. These results indicate that low-wage competition leads to a decline in firms' product diversification strategies especially among smaller firms.

6 Concluding Remarks

I construct a new data-set that provides detailed information on within firm adjustments in employment and product strategies for Danish Textile and Clothing industry. The sample period allows one to

[26] For the purpose of comparison, the same indices as in Lelarge and Nefussi (2010) are used. Lelarge and Nefussi (2010) using a sample of French manufacturing firms, find that competition from low-wage countries is associated with an increase in the diversification of firms' product portfolios while competition from high-wage countries is found to have the opposite effect. In their analysis the competition measure is proxied with the import-penetration rates which are instrumented with the usual instruments without relying on exogenous policy changes.

exploit the MFA quota removals in 2002 and 2005 after the WTO accession of China and the resulting intensification of Chinese (or "low wage country") competition.

First those firms with product portfolios containing products that were subject to MFA quotas before the WTO accession of China are identified. Then, using the difference in differences approach, any disproportionate changes are measured in such firms in response to the quota removal experience, after controlling for firm-fixed effects and aggregate shocks. The results show substantial negative impact of Chinese competition on firm sales, value-added, profit, and employment. Interestingly, competition is also shown to induce significant compositional changes within firms. Particularly, only the jobs that require basic skills or no specific skills are found to be negatively affected, while jobs that require professional and technical skills are not found to be affected by the competition with China. Similarly, employees with lower level of education (high school or less) are found to have the highest likelihood of being laid off due to competition. Thus the results show a significant increase in skill intensity of firms, more specifically the proportion of employees with college education as well as proportion of employees that have professional or technical jobs increases significantly due to the competition. When education levels of employees are analyzed within job categories, it is found that the basic skill category of jobs experiences a disproportionate increase in skill intensity as measured by education levels. These findings may imply a certain flattening of the firms in accordance with lean production principles.

Competition is also found to trigger substantial shuffling of products within firms. While firms' incentive to introduce new products significantly increases with the heightened competition, firms are found to channel their innovative efforts away from the products where China's competitive advantage is now higher. These results indicate that product mixes of firms are endogenous and respond to the competition. They also indicate the importance of product margin in linking import competition to firm-performance. The results altogether show an important role of the distributional impact of low-wage competition within firms in restructuring the industry.

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7 Tables and Figures

Table 3: Sales

Panel A			
Sample	Textile and Apparel Manufacturers (1995-2007)		
	(a)	(b)	(c)
Variable	Log Turnover	Log Value Added	Log Profit
$MFAQSold99_i * Dum02_t$	-0.116^{*}	-0.147^{*}	-0.074
	(0.056)	(0.058)	(0.109)
Year Fixed Effects	yes	yes	yes
Firm Fixed Effects	yes	yes	yes
N	7277	7255	5847
Number of Firms	1092	1092	1035
F	3.030	6.700	3.185
Panel B			
Sample	Textile and Apparel Manufacturers (1995-2007)		
	(a)	(b)	(c)
Variable	Log Turnover	Log Value Added	Log Profit
$MFAQShare99_i * Dum02_t$	-0.248^{**}	-0.296^{***}	-0.335^{*}
	(0.087)	(0.085)	(0.150)
Year Fixed Effects	yes	yes	yes
Firm Fixed Effects	yes	yes	yes
N	7277	7255	5847
Number of Firms	1092	1092	1035
F	3.408	7.200	3.546

Robust standard errors are reported in parentheses. They are clustered for firms. The dependent variable in column a is the natural logarithm of the firm turnover (revenue). The dependent variable in column b is the natural logarithm of the value-added. The dependent variable in column c is the natural logarithm of the profit before taxes.

Table 4: The Impact of Competition on Employment

Sample	Textile and Apparel Manufacturer Firms (1995-2007)	
	(a)	(b)
Variable	Log FTE	Log Labor
$MFAQSold99_i * Dum02_t$	-0.210^{***}	-0.179^{***}
	(0.055)	(0.054)
Year Fixed Effects	yes	yes
Firm Fixed Effects	yes	yes
N	7216	7237
Number of Firms	1092	1086
F	10.883	10.345
$MFAQShare99_i * Dum02_t$	-0.324^{***}	-0.282^{**}
	(0.087)	(0.088)
Year Fixed Effects	yes	yes
Firm Fixed Effects	yes	yes
N	7216	7237
Number of Firms	1092	1086
F	10.934	10.233

Robust standard errors are reported in parentheses. They are clustered for firms. In column a, the dependent variable is the logarithm of the full-time equivalent number of employees. In column b, the dependent variable is the logarithm of the number of employee head-count.

Table 6: The Impact of Competition on Employment By Education Levels

Sample	Textile and Apparel Manufacturers (1995-2006)	
	(a)	(b)
Variable	Log College or Above Level Emp	Log High School or Below Level Emp
$MFAQSold99_i * Dum02_t$	0.053	-0.276^{***}
	(0.042)	(0.042)
Year Fixed Effects	yes	yes
Firm Fixed Effects	yes	yes
N	6841	6841
Number of Firms	1086	1086
F	2.453	17.827
$MFAQShare99_i * Dum02_t$	-0.015	-0.297^{***}
	(0.059)	(0.081)
Year Fixed Effects	yes	yes
Firm Fixed Effects	yes	yes
N	6841	6841
Number of Firms	1086	1086
F	2.467	16.233

Robust standard errors are reported in parentheses. They are clustered for firms. The dependent variable in column a is logarithm of the number of employees with at least some college level education plus 1. The dependent variable in column b is the logarithm of the number of employee with at most high school diploma plus 1. The data sample is between 1995 and 2006. 2007 is not used because 8 digit education variable where the education characteristics variables derived from is not available that year.

Table 5: The Impact of Competition on Employment By Major Occupation Groups

Sample	Textile and Apparel Manufacturer Firms (1996-2007)		
	(a)	(b)	(c)
	Log of Employees who work in	Log of Employees who work in	Log of Employees who work in
Variable	No or Basic Skill Required Jobs	Basic Skill Required Jobs	Technical and Professional Skill Required Jobs
$MFAQSold99_i * Dum02_t$	-0.260^{***}	-0.312^{***}	-0.046
	(0.073)	(0.075)	(0.061)
Year Fixed Effects	yes	yes	yes
Firm Fixed Effects	yes	yes	yes
N	5390	5259	3585
Number of Firms	971	965	733
F	22.776	21.745	3.510
$MFAQShare99_i * Dum02_t$	-0.404^{***}	-0.455^{**}	0.100
	(0.115)	(0.114)	(0.108)
Year Fixed Effects	yes	yes	yes
Firm Fixed Effects	yes	yes	yes
N	5390	5259	3585
Number of Firms	971	965	733
F	23.206	22.266	3.675

Robust standard errors are reported in parentheses. They are clustered for firms. The dependent variable in column (a) is the logarithm of the number of employees that are classified as doing basic skill required jobs (e.g. stationary machinery operators) or no specific skill required jobs employees (e.g. cleaning people, guards). The dependent variable in column (b) is the logarithm of the number of employees that are classified as doing basic skill required jobs. The dependent variable in column (c) is the logarithm of the number of employees that are classified as executives, top-level employees (e.g. engineers) and intermediate-level employees, (e.g. laboratory technician, computer programmer). Since the occupation classifications have changed in 1996, there is a structural break in occupation variables between 1995 and 1996. So the 1995 data are not used in this analysis. The source of the data is persondata (IDA).

Table 7: Skill Intensity

Sample	Textile and Apparel Manufacturers (1995-2006)		
	(a)	(b)	(c)
Variable	Log College Educated Share	Log High School Educated Share	Log College Educated Wage Share
$MFAQSold99_i * Dum02_t$	0.234^{***}	-0.116^{***}	0.140^{*}
	(0.060)	(0.028)	(0.068)
Year Fixed Effects	yes	yes	yes
Firm Fixed Effects	yes	yes	yes
N	3377	6301	3289
Number of Firms	678	1047	671
F	14.836	10.029	12.007
$MFAQShare99_i * Dum02_t$	0.324^{**}	-0.049	0.297^{**}
	(0.104)	(0.042)	(0.112)
Year Fixed Effects	yes	yes	yes
Firm Fixed Effects	yes	yes	yes
N	3377	6301	3289
Number of Firms	678	1047	671
F	14.815	17.827	12.167

Robust standard errors are reported in parentheses. They are clustered for firms. The dependent variable in column a is logarithm of the share of employees with at least some college level education. The dependent variable in column b is logarithm of the share of employees with at most high school diploma. The dependent variable in column c is the logarithm of the ratio of the wages to the college educated over total wages. The data sample is between 1995 and 2006. 2007 is not used because 8 digit education variable where the education characteristics variables derived from is not available that year.

Table 8: The Impact of Competition on Wages

Sample	Textile and Apparel Manufacturers				
	(1995-2007)	(1996-2007)	(1996-2007)	(1995-2006)	(1995-2006)
	(a)	(b)	(c)	(d)	(e)
	Log Average	Log Average	Log Average	Log Average	Log Average
Variable	Wage	Basic-Level Jobs Wage	High-Level Jobs Wage	High School Wage	College Wage
$MFAQSold99_i * Dum02_t$	0.048^{*}	0.105^{***}	-0.034	0.037	-0.070
	(0.023)	(0.026)	(0.037)	(0.031)	(0.045)
Year Fixed Effects	yes	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes	yes
N	7149	5259	3585	6181	3289
Number of Firms	1086	965	733	1046	671
F	7.926	6.159	0.936	3.731	4.335
$MFAQShare99_i * Dum02_t$	0.032	0.062	-0.085	0.047	0.038
	(0.037)	(0.047)	(0.052)	(0.042)	(0.063)
Year Fixed Effects	yes	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes	yes
N	7149	5259	3585	6181	3289
Number of Firms	1086	965	733	1046	671
F	6.225	4.495	1.157	3.311	4.602

Robust standard errors are reported in parentheses. They are clustered for firms. The dependent variable in column a is the logarithm of the average (per head-count) salary. It does not include the benefits. The dependent variable in column b is logarithm of the average wage of employees who do jobs that require basic-level skills. The dependent variable in column c is the logarithm of the average wage of employees who do jobs that require proffessional/technical level skills. The dependent variable in column d is the logarithm of the average wage of employees with at most high school diploma. The dependent variable in column e is logarithm of the average wage of employees with at least some college schooling. In columns (b) and (c), year 1995 data are not used because a new occupation groupings (DISCO-88) has implemented in year 1996. In columns (d) and (e), year 2007 data are not used because the 8-digit education code (hffsp) where education-related variables are derived from is not available that year.

Table 9: Capital

Panel A			
Sample	Textile and Apparel Manufacturers (1995-2007)		
	(a)	(b)	(c)
Variable	Log Capital	Log Investment	Log Capital Per Labor
$MFAQSold99_i * Dum02_t$	0.013	-0.213^{*}	0.214^{*}
	(0.091)	(0.095)	(0.087)
Year Fixed Effects	yes	yes	yes
Firm Fixed Effects	yes	yes	yes
N	7112	6597	7052
Number of Firms	1082	1071	1082
F	14.264	31.958	15.773
Panel B			
Sample	Textile and Apparel Manufacturers (1995-2007)		
	(a)	(b)	(c)
Variable	Log Capital	Log Investment	Log Capital Per Labor
$MFAQShare99_i * Dum02_t$	-0.007	-0.392^{**}	0.322^{*}
	(0.119)	(0.143)	(0.128)
Year Fixed Effects	yes	yes	yes
Firm Fixed Effects	yes	yes	yes
N	7112	6597	7052
Number of Firms	1082	1071	1082
F	14.283	32.664	15.672

Robust standard errors are reported in parentheses. They are clustered for firms. The dependent variable in column a is the logarithm of the physical capital assets. The dependent variable in column b is the logarithm of the total investment in physical assets. The dependent variable in column c is the logarithm of the physical capital per labor.

Table 10: Intangible Assets and Firm Scale

Panel A		
Sample	Textile and Apparel Manufacturers (1995-2007)	
	(a)	(b)
Variable	Log Intangible Assets	Firm Scale
$MFAQSold99_i * Dum02_t$	-0.332^{*}	-0.255^{*}
	(0.135)	(0.129)
Year Fixed Effects	yes	yes
Firm Fixed Effects	yes	yes
N	5849	5849
Number of Firms	1051	1051
F	81.919	102.654
Panel B		
Sample	Textile and Apparel Manufacturers (1995-2007)	
	(a)	(b)
Variable	Log Intangible Assets	Firm Scale
$MFAQShare99_i * Dum02_t$	-0.134	0.044
	(0.200)	(0.187)
Year Fixed Effects	yes	yes
Firm Fixed Effects	yes	yes
N	5849	5849
Number of Firms	1051	1051
F	83.913	105.615
Panel C		
Sample	Textile and Apparel Manufacturers (1995-2007)	
	(a)	(b)
Variable	Log Intangible Assets	Firm Scale
$MFAQ2Share99_i * Dum02_t$	-1.700^{**}	-1.517^{**}
	(0.600)	(0.538)
Year Fixed Effects	yes	yes
Firm Fixed Effects	yes	yes
N	5849	5849
Number of Firms	1051	1051
F	83.380	105.011

Robust standard errors are reported in parentheses. They are clustered for firms. The dependent variable in column (a) is the natural logarithm of the value of intangible assets. The dependent variable in column (b) is the logit transformation of the ratio of intangible assets over total assets.

Table 11: New Product Introductions in Response to 2002 Quota Removal

Panel A			
Sample	Textile and Apparel Manufacturers 1995-2005		
Variables	Log Number of 1+ New Products (6 digit)	Log Number of 1+ New Products (8 digit)	Log Number of 1+ New Varieties
$MFAQ2Sold99_i * Dum02_t$	0.106	0.160*	0.207***
	(0.063)	(0.065)	(0.062)
Size (# of products) Quintile II	0.502***	0.539***	0.064**
	(0.031)	(0.032)	(0.019)
Size (# of products) Quintile III	1.029***	1.071***	0.139***
	(0.040)	(0.040)	(0.022)
Size (# of products) Quintile IV	1.770***	1.828***	0.316***
	(0.048)	(0.048)	(0.033)
Size (# of products) Quintile V	2.709***	2.759***	0.681***
	(0.067)	(0.066)	(0.056)
Year Fixed Effects	yes	yes	yes
Firm Fixed Effects	yes	yes	yes
Number of Observation	3858	3858	3858
Number of Firms	779	779	779
F	177.424	185.567	18.323
Panel B			
Sample	Textile and Apparel Manufacturers 1995-2005		
Variables	Log Number of 1+ New Products (6-digit) Among Non-MFA Categories	Log Number of 1+ New Products (8-digit) Among Non-MFA Categories	Log Number of 1+ New Varieties Among Non-MFA Categories
$MFAQ2Sold99_i * Dum02_t$	0.184**	0.214***	0.178**
	(0.062)	(0.063)	(0.057)
Size (# of products) Quintile II	0.421***	0.448***	0.038*
	(0.031)	(0.033)	(0.018)
Size (# of products) Quintile III	0.949***	0.985***	0.107***
	(0.042)	(0.043)	(0.021)
Size (# of products) Quintile IV	1.621***	1.684***	0.272***
	(0.051)	(0.052)	(0.031)
Size (# of products) Quintile V	2.550***	2.611***	0.597***
	(0.069)	(0.068)	(0.052)
Year Fixed Effects	yes	yes	yes
Firm Fixed Effects	yes	yes	yes
Number of Observation	3858	3858	3858
Number of Firms	779	779	779
F	148.003	156.070	15.341

Robust standard errors are reported in parentheses. They are clustered for firms. Product classification is made using export transaction data between 1993 and 2007 combined with domestic sales data between 1995-2005. A new product is defined as a product that a firm started to sell/export that current year, which is not observed to sold by the firm in previous years. The estimated coefficients of $MFAQ2Sold99_i * Dum02_t$ under the the fixed effect negative binomial estimators when the dependent variable is the count number are found to be 0.256^{***} (0.061), 0.283^{***} (0.058), 0.398^{**} (0.115) for the Panel A columns a, b, and c specifications respectively. For the Panel B specifications, the coefficients and the standard errors are 0.367^{***} (0.064), 0.373^{***} (0.060), and 0.364^{**} (0.123) respectively for columns a, b, c.

Table 12: Product Dropping in Response to 2002 Quota Removal

Sample	Textile and Apparel Manufacturers 1995-2005			
Variables	Log Number of 1+ Dropped Products (6-digit)	Log Number of 1+ Dropped Products (8-digit)	Log Number of 1+ Dropped Existing Products (6-digit)	Log Number of 1+ Dropped Existing Products (8-digit)
$MFAQ2Sold99_i * Dum02_t$	0.531^{***}	0.527^{***}	0.461^{***}	0.480^{***}
	(0.079)	(0.079)	(0.091)	(0.089)
Size (# of products) Quintile II	0.453^{***}	0.489^{***}	0.123^{**}	0.132^{***}
	(0.037)	(0.036)	(0.039)	(0.038)
Size (# of products) Quintile III	0.923^{***}	1.001^{***}	0.300^{***}	0.342^{***}
	(0.042)	(0.041)	(0.048)	(0.049)
Size (# of products) Quintile IV	1.546^{***}	1.634^{***}	0.575^{***}	0.606^{***}
	(0.055)	(0.052)	(0.064)	(0.063)
Size (# of products) Quintile V	2.377^{***}	2.487^{***}	1.058^{***}	1.136^{***}
	(0.070)	(0.066)	(0.082)	(0.080)
Year Fixed Effects	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes
Number of Observation	3761	3761	3481	3481
Number of Firms	746	746	678	678
F	121.706	146.961	50.630	56.766

Robust standard errors are reported in parentheses. They are clustered for firms. Product classification is made using export transaction data between 1993 and 2007 combined with domestic sales data between 1995-2005. A dropped product is defined as a product that a firm stopped selling that current year, not observed to sold by the firm in subsequent years. For firms that appear the last time in the data-set, dropped product indicator takes missing value. The estimated coefficients and the associated standard errors of $MFAQ2Sold99_i * Dum02_t$ under the the fixed effect negative binomial estimators are found to be 0.396^{***} (0.062), 0.425^{***} (0.057), 0.130 (0.098), and 0.223^{*} (0.089) for the columns a, b, c, and d specifications respectively.

Table 13: Product Scope

Sample	Textile and Apparel Manufacturers 1995-2005			
Variables	Number of Products	Number of Exported Products	Number of Products	Number of Exported Products
$MFAQ2Sold99_i * Dum02_t$	-0.085^{*}	-0.134^{**}		
	(0.042)	(0.049)		
$MFAQ2Sold99_i * Dum02_t * Quartile1$			-1.744^{***}	-1.617^{***}
			(0.226)	(0.240)
$MFAQ2Sold99_i * Dum02_t * Quartile2$			-1.032^{***}	-0.970^{***}
			(0.119)	(0.133)
$MFAQ2Sold99_i * Dum02_t * Quartile3$			-0.547^{***}	-0.630^{***}
			(0.085)	(0.108)
$MFAQ2Sold99_i * Dum02_t * Quartile4$			0.150^{***}	0.098^{*}
			(0.040)	(0.048)
$MFAQ2Sold99_i$	0.265^{***}	0.024	0.602^{***}	0.275^{**}
	(0.079)	(0.089)	(0.082)	(0.092)
Year Fixed Effects	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes
Number of Observation	4018	3929	4018	3929
Number of Firms	683	658	683	658
χ^2	787.062	607.550	1294.184	893.856

The results are obtained from the fixed effect negative binomial estimation. The product definitions are at the 6-digit HS. The dependent variable in column a and c is the number of products that a firm produces. The dependent variable in column b and d is the number of exported products.

Table 14: Product Diversification

Sample	Textile and Apparel Manufacturers 1995-2005			
Variables	Log DIV	Main Activity Share (CI)	Log DIV	Main Activity Share (CI)
$MFAQ2Sold99_i * Dum02_t$	-0.067	0.040^{*}		
	(0.044)	(0.018)		
$MFAQ2Sold99_i * Dum02_t * Quartile1$			-0.495^{***}	0.205^{***}
			(0.122)	(0.050)
$MFAQ2Sold99_i * Dum02_t * Quartile2$			-0.372^{***}	0.159^{***}
			(0.111)	(0.048)
$MFAQ2Sold99_i * Dum02_t * Quartile3$			-0.114^{*}	0.045^{*}
			(0.051)	(0.022)
$MFAQ2Sold99_i * Dum02_t * Quartile4$			0.036	0.003
			(0.051)	(0.020)
Year Fixed Effects	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes
Number of Observation	4210	4210	4210	4210
Number of Firms	875	875	875	875
F	4.798	3.688	5.252	4.229

The dependent variable in column a and c is the logarithm of the diversification index as defined in the text. The dependent variable in column b and d is the share of the firm's main product (CI) as defined in the text. Robust standard errors are clustered for firms.

APPENDIX

Table A-1: The Impact of Competition on Employment By Major Occupation Groups II

Sample	Textile and Apparel Manufacturer Firms			
	(a)	(b)	(c)	(d)
Variable	Log FTE	Log Labor	Log Basic Level or Below Jobs	Log Intermediate Level or Above Jobs
$MFAQSold95_i * 1996$	−0.019	−0.047	–	–
	(0.039)	(0.039)	–	–
$MFAQSold95_i * 1997$	−0.088	−0.012	0.043	0.053
	(0.050)	(0.055)	(0.044)	(0.044)
$MFAQSold95_i * 1998$	−0.031	−0.058	−0.008	0.062
	(0.061)	(0.057)	(0.052)	(0.045)
$MFAQSold95_i * 1999$	−0.029	−0.096	−0.032	0.040
	(0.066)	(0.073)	(0.063)	(0.056)
$MFAQSold95_i * 2000$	−0.074	−0.021	−0.028	0.084
	(0.070)	(0.068)	(0.065)	(0.063)
$MFAQSold95_i * 2001$	−0.117	−0.059	−0.066	0.076
	(0.076)	(0.071)	(0.074)	(0.065)
$MFAQSold95_i * 2002$	-0.241^{**}	-0.204^{*}	-0.175^{*}	0.035
	(0.089)	(0.079)	(0.082)	(0.075)
$MFAQSold95_i * 2003$	-0.170^{*}	-0.191^{*}	-0.181^{*}	−0.007
	(0.084)	(0.087)	(0.091)	(0.081)
$MFAQSold95_i * 2004$	-0.277^{**}	-0.299^{**}	-0.329^{**}	−0.035
	(0.088)	(0.095)	(0.100)	(0.084)
$MFAQSold95_i * 2005$	-0.317^{***}	-0.263^{**}	-0.340^{***}	0.085
	(0.095)	(0.094)	(0.103)	(0.088)
$MFAQSold95_i * 2006$	-0.282^{*}	-0.250^{*}	-0.244^{*}	0.016
	(0.110)	(0.106)	(0.105)	(0.103)
$MFAQSold95_i * 2007$	-0.381^{**}	-0.322^{**}	-0.377^{**}	0.025
	(0.122)	(0.109)	(0.115)	(0.103)
Year Fixed Effects	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes
N	7216	7237	6349	4997
Number of Firms	1092	1086	1016	881
F	10.883	10.345	5.833	2.178

Robust standard errors are reported in parentheses. They are clustered for firms. In column a, the dependent variable is the logarithm of the full-time equivalent number of employees. In column b, the dependent variable is the logarithm of the number of employee head-count. In column c, the dependent variable is the logarithm of the number of occupied jobs that are below intermediate level (basic skill, no skill, unspecified). In column d, the dependent variable is the logarithm of the number of occupied jobs that are intermediate level or above. $MFAQSold95_i$ is an indicator variable that takes 1 if firm i is found to produce MFA quota goods in 1995.

Table A-2: The Impact of Competition on Wages II

Sample	Textile and Apparel Manufacturers (1996-2006)			
	(a)	(b)	(c)	(d)
Variable	Log College Rate Among Basic Level Jobs	Log Average Experience Among Basic Level Jobs	Log College Rate Among High Level Jobs	Log Average Experience Among High Level Jobs
$MFAQSold99_i * Dum02_t$	0.324^{***}	0.121^{***}	0.043	-0.011
	(0.090)	(0.030)	(0.059)	(0.034)
Year Fixed Effects	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes
N	1546	4986	2006	3390
Number of Firms	372	958	458	721
Adj R^2	0.201	0.082	0.026	0.159
F	8.865	37.713	2.159	22.343
$MFAQShare99_i * Dum02_t$	0.301^{*}	0.157^{***}	0.021	0.069
	(0.152)	(0.038)	(0.113)	(0.054)
Year Fixed Effects	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes
N	1546	4986	2006	3390
Number of Firms	372	958	458	721
F	9.466	34.793	2.180	20.892

Robust standard errors are reported in parentheses. They are clustered for firms. The dependent variable in column a is the logarithm of the share of college level employees among basic level occupations. The dependent variable in column b is the logarithm of the average work experience level of employees who have basic level occupations. The dependent variable in column c is the logarithm of the share of college level employees among high level occupations. The dependent variable in column d is the logarithm of the average work experience level of employees who have high level jobs.

Table A-3: New Product Introductions Among MFA Categories

Sample	Textile and Apparel Manufacturers 1995-2005	
Variables	Log Number of 1+ New Products (6-digit) Among MFA Categories	Log Number of 1+ New Products (8-digit) Among MFA Categories
$MFAQ2Sold99_i * Dum02_t$	-0.157^{**}	-0.099
	(0.055)	(0.058)
Size (# of products) Quintile II	0.142^{***}	0.161^{***}
	(0.022)	(0.023)
Size (# of products) Quintile III	0.245^{***}	0.269^{***}
	(0.028)	(0.030)
Size (# of products) Quintile IV	0.532^{***}	0.573^{***}
	(0.038)	(0.040)
Size (# of products) Quintile V	0.987^{***}	1.043^{***}
	(0.059)	(0.063)
Year Fixed Effects	yes	yes
Firm Fixed Effects	yes	yes
Number of Observation	3859	3859
Number of Firms	781	781
F	25.533	24.784

Robust standard errors are reported in parentheses. They are clustered for firms. Product classification is made using export transaction data between 1993 and 2007 combined with domestic sales data between 1995-2005. A new product is defined as a product that a firm started to sell/export that current year, which is not observed to sold by the firm in previous years.

A Constructing Matched Data Sets for the Textile and Clothing Industry

The data sets used in this study are compiled from different sources mainly within Danmark Statistik. The main data sets are international trade data-set (Udtræk Udenrigshandel), domestic trade data-set (Udtræk Varestatistik), firm accounting data-set (Udtræk Regnskabsdata) and person data-set (Udtræk Persondata / IDA). Detailed information regarding the content, coverage as well as the variable definitions of these data-sets can be found at http://www.dst.dk/HomeDK/Statistik/dokumentation/times.aspx. Quota information is reported in the SIGL (Système Intégré de Gestion de Licenses) database and is available online at http://trade.ec.europa.eu/sigl/index.html.

Below I will provide a brief summary of the content and coverage of the confidential data, starting with the International trade data-set: The foreign trade data sets are compiled from the Danish Customs records. Each shipment record includes the date of the shipment, the value of shipment, the product code (The Combined Nomenclature (CN)-8 digit)[27], the name of the product, weight of the shipment, type of the weight and sometimes quantity information as well as the unique firm identifier. Statistics

[27]The CN is comprised of the Harmonized System (HS) nomenclature with further European Community subdivisions. The first 6-digit of the classification matches with the Harmonized System. The detailed description of the CN codes can be found at http://udr.dst.dk/nomenklatur/index.aspx

Denmark aggregated this data into annual shipments for each triplet of product (CN-8 digit), country and firm. As provided by the Statistics Denmark, the international transaction data-set covers the universe of the Danish firms' transactions between the period of 1993-2007.

Domestic trade data; the industry's sales of products are recorded in the 10-digit product classification. The first 8 digits of the classification of industry sales of goods is always identical to the combined nomenclature. This data-set is available for the period 1995-2005. Only firms with employment of 10 people or more are included in this data-set.

Firm Accounting data: Business statistics data are compiled from survey results of firms that take part in an annual financial survey as well as from tax reports, vat reports, and annual reports from incorporated companies. The general business statistics include only firms that employ at least a 0.5 FTE (full-time equivalent employment) employment and/or have had an estimated earnings of a certain size. Earning sizes are estimated differently for different industries.[28]. However, some of the data for small firms may be subject to imputation. This data-set is available starting from 1995. However only manufacturing, construction and retail sectors are included until 1998. In 1998, the wholesale trade sector is included and starting from 1999 it covers almost all sectors including mining, and all business service sectors.[29]

Raw materials, intermediate goods, capital goods, electric, gas, water, and output deflators provided by the Danish Statistik are used to deflate the nominal variables. Wages are deflated using cpi. Sales values are deflated separately for the textile and apparel producers using the output deflators. Values are expressed in thousand year 2000 constant Danish Kroner. Physical capital assets include plant, machinery, technical installations, land, buildings, and other equipments such as computers, and office furniture.

Integrated Database for Labour Market Research (IDA): A longitudinal yearly data-set of persons (age 15-70) are merged with establishments. It contains establishment and industry codes, education-level, wages, type of jobs, work experience, age, and other person classifications. For a complete description see the Danmarks Statistik document here.

All of the data-sets are accessed through the LMDG (Labor Market Development and Growth) project sponsored servers, and the routine cleaning procedures have been executed both by the Danish Statistics

[28]In the wholesale trade sectors, the limit of earnings is typically over 500,000 Danish Kroner, while in the manufacturing industry, it ranges between 150,000 and 200,000 Danish Kroner.

[29]Starting from 1999, the data-set includes hospitality, transportation, telecommunication, real estate, rental services, information technology services, research and development services, and other consultancy and business services. It does not include agriculture, financial sector, public, education and medical service sectors.

employees but also by the LMDG. For the details of the cleaning procedures conducted by the LMDG project, see Bunzel (2009).

A.1 Employee Characteristics (IDA)

Every person is attached a code regarding its status in the firm, such as the 'employer', 'director', 'top-level employee', 'mid-level employee' etc..The structure of this occupation code changed in 1996 in order to comply with the major groupings of the the International Standard Classification of Occupations Codes (ISCO-88)[30]I drop inactive people such as retirees, employees on leave as well as owners' spouses before we calculate the employment characteristics for each firm.

The classification of professional and technical employees in the analysis refers to the pstill2 codes 31, 32, and 34 which are executives, top-level professional employees and intermediate level professional and technical employees, respectively. The classification of employees with basic skill requirement refers to the pstill2 value 35, which includes work that requires basic level skills, such as, office work, or operating different types of stationary machinery. The classification of employees with no skill requirement refers to the pstill2 value 36, which includes works such as cleaning services, delivery services, guard work, and transport work. The last grouping , which refers to the pstill2 value 37, contains unclassified jobs.

In order to extract information about the educational backgrounds of people, I use an 8-digit education code, 'hffsp', that shows the person's maximum completed education level combined with professional training. The first two digit of the code indicates the main education groups. The group of people with at most high school diploma refers to the hffsp value equal or smaller than 25 in the first two digits. The group of people with at least some college schooling refers to the hffsp value equal or bigger than 40 in the first two digits. For a complete description of this code, see the Danmarks Statistik document here Since 8-digit education code is not reported in 2007, the relevant variables are not constructed for that year.

In the labor (IDA) data-set, for each employed person there is a unique firm identifier provided for the employer. Using this firm identifier, extracted information from IDA is merged with the Firm Accounting Data Set for each year. Only a couple of observations in firm accounting data have left unmatched from this matching.

[30]For a detailed description of the code, 'pstill2', see the Danmarks Statistik document here

A.2 Product Characteristics

Export data between 1993 and 2007 and domestic trade between 1995 and 2005 are merged to construct product classifications. The first 8 digit of the product categories in the domestic trade data are the same as the combined nomenclature (CN) as reported in the international trade data. Product classifications are made according to both 8-digits and 6-digit classifications.

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A.3 Summary Statistics

Table A-4: Summary Statistics I

Sample	Textile and Apparel Manufacturers 1995-2007						
Variables	N	Median	Mean	Standard Deviation	Min	Max	Source
Turnover	7278	5117.115	21554.99	54830.24	0	1157841	Regnskabsdata
Profit	7278	242.6939	1253.637	7045.777	-40353.81	180298	Regnskabsdata
Total Assets	7278	3576.726	17963.84	68433.09	0	1433919	Regnskabsdata
Capital	7278	931.9454	5270.511	21613.47	0	650510.1	Regnskabsdata
Investment	7278	132.1346	1051.773	6643.59	0	240731.7	Regnskabsdata
Full-time Equivalent Labor	7278	5.94	17.96442	39.36194	0	761	Regnskabsdata
Head-Count Labor	7237	8	20.149	41.284	1	841	IDA
Average Full Wage	7216	261.817	275.439	108.200	0	2787.473	Regnskabsdata

Values are expressed in constant 2000 prices in thousand Danish kroner.

Table A-5: Summary Statistics II

Sample	Textile and Apparel Manufacturers 1996-2007						
Variables	N	Median	Mean	Standard Deviation	Min	Max	Source
Professional and Technical Labor	6544	1	3.501	8.367	0	131	IDA
Basic or Non-Skilled Labor	6544	3	12.688	30.974	0	570	IDA
Unclassified Labor	6544	2	3.090	6.811	0	216	IDA

Table A-6: Summary Statistics III

Sample	Textile and Apparel Manufacturers-All Products 1995-2005					
Source: Custom and Domestic Sales Data Sets						
Variables	N	Median	Mean	Standard Deviation	Min	Max
Number of 8-digit Products	4210	7	17.208	28.750	1	281
Number of 6-digit Products	4210	6	15.531	25.146	1	236
Number of New 8-digit Products	3858	2	6.376	12.099	0	174
Number of New 6-digit Products	3858	2	5.605	11.105	0	173
Number of New Variety	3858	0	0.771	1.745	0	20
Number of Dropped 8-digit Products	3761	2	5.715	11.450	0	173
Number of Dropped 6-digit Products	3761	2	4.914	10.438	0	173