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Abstract

Using the dismantling of trade quotas on Chinese textile and clothing products in conjunction with China's accession to the WTO and an employer-employee matched data-set for the period 1999 to 2010, workers' adjustments to intensified low-wage competition is analyzed. Utilizing within-industry heterogeneity in workers' exposure to this trade shock, results reveal negative and significant impact of the low-wage import shock on workers' future earnings and employment trajectories. The abolishment of quotas leads to higher likelihood of unemployment and shorter future tenure for workers. While most workers employed by firms exposed to low-wage competition are influenced negatively to a similar extent at the exposed employer, the degree of adjustment to the initial shock varies greatly across different types of workers. In particular less-educated, older and those who had elementary occupations or occupations that require industry-specific training at the exposed firms had the worst adjustment experience. The results suggest that adjustment costs are very important and heterogeneous across different types of workers and highlight the need for targeting specific groups in assistance and adjustment schemes.

JEL Classification: F16; J60; J31; L67

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1 Introduction

The distributional impact of globalization is an important dimension of the public debate that currently shapes the climate of economic policy making. While economic theory emphasizes the overall net benefits of globalization, in the short run the benefits of globalization are unequally distributed among economic actors within countries, of whom some may even lose out. It is often claimed that blue-collar manufacturing workers in advanced countries bear short-run costs of globalization as they find themselves in competition with much cheaper workers in low-wage countries. Supporting such claims, by utilizing the dramatic surge of Chinese goods in the world trade over a short span of time in recent years, many studies document significant labor reallocation in manufacturing industries as a result of Chinese competition (e.g. Bernard, Jensen, Schott (2006), Bloom, Draca, Van Reenen (2011), Autor, Dorn, Hanson (2013), Utar and Torres-Ruiz (2013)). However these studies do not answer how manufacturing workers, displaced from their workplaces due to competition with China, adjust.

Very recently Autor, Dorn, Hanson and Song (2013) documented that American workers under direct threat from low-wage import competition have lower cumulative earnings, higher risks of exiting the labor force and higher likelihood of receiving public disability support. Contributing to the literature on workers' adjustment to trade shocks, in this paper I analyze the impact of Chinese competition on workers' outcomes in a European country with a generous social net and active labor market policies. I utilize the exogenous expiration of the Multi-fiber Arrangement (MFA) quotas for China to identify workers who were employed in Danish firms that were hit by cheaper imports from China, and analyze the impact of a Chinese import shock on workers' future earnings and employment.

I follow workers employed in the textile and clothing sector (T&C) in 1999, and examine how they adjust to the globalization shock due to the removal of MFA quotas for China in conjunction with its WTO membership over the period 2002 to 2010. To do that, I first identify firms that domestically produce products that were subject to MFA quotas. Then, using matched employer-employee level data, I identify workers who were employed in affected firms before the WTO accession of China. I then measure differential outcomes of these affected workers relative to other T&C workers over the years 2002-2010 after controlling for detailed

worker and workplace characteristics and industry-wide aggregate shocks.

Technological forces are among important factors that cause decline in manufacturing employment in advanced countries (Machin and Van Reenen (1998)). Especially, labor-intensive industries such as the T&C industry have been shrinking since the 1960s due to factors that include both low-wage competition and technological changes. Hence it is vital to be able to distinguish the impact of the trade shock from other factors. The empirical strategy in this paper directly utilizes the change in trade policy, rather than relying on import measures that are potentially contaminated with domestic demand and supply factors. In addition, by producing estimates that are relative to other T&C workers facing the same technological and demand shocks, this study is able to disentangle the impact of trade shock on workers' outcomes from other factors and thus derive causal implications.

Using individual worker-level, firm-level and product-level data from Statistics Denmark, and exploiting an exogenous abolishment of the trade quotas for China, I show that MFA quota abolishment for China leads to significant declines in Danish workers' earnings over the period 2002-2010. The MFA quota abolishment also leads to higher likelihood of switching to service sector jobs. Results further show higher likelihood of unemployment and shorter future tenure for workers but not a higher likelihood of leaving the labor market altogether. The main channels through which the trade shock affects workers are found to be a shorter employment spell at the firm that was exposed to the competition shock and subsequent difficulty in maintaining stable employment.

The results presented in this paper provide a point of comparison from another advanced country with a Nordic social system with the findings by Autor, Dorn, Hanson, and Song (2014) from American workers' adjustment to the Chinese trade shock. The results show that the significant negative effect on workers' labor earnings of Chinese imports is not particular to the US economy. The nature of the US data prevents Autor, Dorn, Hanson, and Song (2014) from examining whether their documented reductions in per year earnings were due to loss in hours worked or hourly wages. The results in this paper show that the main adjustment channel of the negative shock operated on the quantity margin in Denmark (number of hours worked instead of hourly rates). These results are consistent with the general structure of the

Danish labor market which is characterized by very liberal hiring-firing regulations with a high degree of unionization[1] and allow an informed discussion of whether institutional differences play an important role in shaping the adjustment mechanism.

Previous literature investigating the question of whether trade with lower wage countries was an important factor in driving the increase in income inequality observed in the 1980s and 1990s in many advanced countries did not find strong empirical support in comparison to alternative explanations such as technology factors.[2] Studies in this literature mostly focus on wage changes within the manufacturing sector[3], while results presented here show that workers' movement to the service sector is an integral part of the adjustment and indicate that focusing only on the manufacturing sector will not provide a complete picture of the potential impact of trade shocks on wages.

MFA quotas, while economically important and substantial (Khandelwal, Schott and Wei (2013), Brambilla, Khandelwal and Schott (2010), Utar (forthcoming)), concern only textile and clothing products. Empirical literature on labor market outcomes in response to trade shocks mostly focus on economy-wide trade liberalization episodes.[4] In addition to helping establish causality, examining removal of MFA quotas to analyze workers' adjustment to low-wage import shock also helps releasing results from general equilibrium effects and spill-overs from other industries that normally cause convoluted results when examining general trade liberalization episodes.

The data also allow me to examine the differential impact of low-wage competition according to worker and firm characteristics. I find that workers are more or less homogeneously affected by the import shock via their employment at a firm exposed to the competition. However heterogeneity across workers was found to matter significantly as workers adjust to the shock

[1]The Global Competitiveness Report 2013-2014 ranks Denmark 6th among 148 countries at hiring and firing practices, indicating very de-regulated hiring and firing practices (US is ranked 9th in the same ranking), while it is ranked 93rd for flexibility of wage determination.

[2]In the US, for example, the share of income received by the lowest quintile of households fell from 4.4 % in 1977 to 3.6 % in 1997, while the share of income received by the highest quintile of households has risen from 43.6 to 49.4 % over the same period (Feenstra (2000)).

[3]Contribution to this literature includes Revenga (1992), Hanson and Harrison (1999) among others.

[4]For a recent example, see Menezes-Filho and Muendler (2011).

after displacement. Particularly college educated workers have an easier time finding alternative jobs in the service sector that can allow them to compensate relatively quickly for the earnings loss incurred at the exposed employer. Workers with vocational and lower level of education on the other hand are not found to be as lucky in finding and keeping jobs that can help them recover from the bad shock. Mid-aged displaced workers tend to stay within the sector relative to older and younger cohorts. Younger cohorts and male workers fare better in subsequent service sector jobs compared to older cohorts and female workers respectively. These results point to the importance of short-run adjustment costs of globalization and inform policy makers about the most vulnerable.

There is a valuable literature that uses a structural approach to workers adjustment to trade shocks. Some studies using a structural empirical model are aimed at recovering trade adjustment costs that workers face (e.g. Artuc, Chaudhuri and McLaren (2010), Dix-Carneiro (2014)) and others at analyzing the relationship between trade and wage inequality in the presence of search frictions (e.g. Helpman, Itshoki, Muendler and Redding (2014)). This paper's findings also inform structural studies empirically on modeling workers' adjustment. In particular, they suggest that adjustment costs substantially differ across workers with different characteristics.

This paper is organized as follows. Data used in this study are described in the next section. Background information on the MFA quotas and Danish labor market institutions is provided in section 3, followed by a description of the empirical strategy in section 4. Results are presented and discussed in section 5 followed by concluding remarks in section 6.

2 Data

The main database used in this study is the Integrated Database for Labor Market Research, IDA, which is comprised of person, establishment, and job files. The person files contain annual information on all persons of age 15-70 residing in Denmark with a social security number. The establishment files contain annual information on all establishments with at least one employee in the last week of November in each year. The job files provide information on all jobs that

are active in the last week of November in each year. IDA data-sets are complemented with the domestic production data-set (VARES) that covers all manufacturing firms with at least 10 employees, and the annual longitudinal data-set that matches firms with their employees (FIDA). The sample period of constructed data-sets is 1999-2010. The data-sets are from Statistics Denmark (Danmarks Statistik).

For each worker I observe, among others, annual and hourly salary for their primary employment, industry code for the primary employment, the occupational status in the primary employment, education level, demographic characteristics such as age, gender and family status, and total salaries obtained from all jobs held within a year. The domestic production data-set (VARES) is used to identify firms with domestic production in one or more of the goods that were subject to the MFA quotas. Through FIDA, the firm identification numbers are mapped with worker-level information.

In contrast to the U.S. data used by Autor, Dorn, Hanson and Song (2014), the IDA database provides information on hours worked as well as detailed occupation and education levels of employees. This facilitates additional and more detailed analyses of workers' adjustment. Matched employer-employee data from developing countries, such as the one from Brazil used in Menezes-Filho and Muendler (2011), provide information only on workers who are (formally) employed. So no information is provided for workers if they are informally employed, unemployed, self-employed, or just outside the labor market. In contrast to these data-sets, the IDA database contains information on every person regardless of their labor market status as long as they are between 15 and 70 years old. Tables A-1 and A-3 present sample information from the 1999-cross section of workers' demographic, education and occupation characteristics. Table A-4 presents sample information from the 1999-cross section of workplace characteristics. The fact that the IDA database provides information on everybody in the labor market instead of, for example, surveying a random sample or 'formal employees' allows me to conduct a detailed study that utilizes a policy change for a single industry.

Quota information is reported in the Système Intégré de Gestion de Licenses (SIGL) 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 8 digit products based on Combined Nomenclature 1999.[5]

3 Background Information

3.1 MFA Quotas

Due to its political sensitivity as a traditionally labor intensive industry, world trade in T&C was excluded from the agreement when GATT was signed in 1948 and continued to be governed by bilateral agreements. As the number of agreements grew, the Multi-fibre Arrangement was introduced in 1974 to govern the world trade in T&C. Denmark is a member of the EU (formerly the European Community) since 1973 and most MFA quotas were negotiated for the EU as a whole. Starting 1993 the quotas have also been managed at the EU level, harmonizing any member state specific differences.

In 1995 the Agreement on Textiles and Clothing (ATC) replaced the MFA, and provisions were made for phasing it out in four steps over a period of 10 years. Quotas were to be eliminated equivalent to 16 percent of 1990 imports at the beginning of 1995, 17 percent at the beginning of 1998, 18 percent at the beginning of 2002, and the remaining 49 percent at the beginning of 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.[6]

[5] Annex I of the "Council Regulation (EEC) No 3030/93 of 12 October 1993 on common rules for imports of certain textile products from third countries" is used as a main reference for the concordance between quota categories and the CN 8-digit products. The annex is available at the SIGL. The same mapping is also used in Utar (forthcoming) with a difference that quotas for China that were extended until the beginning of 2008 are also included in this study. See footnote 6.

[6] Due to an 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 retained a few of the quota categories until 2008. This event is popularly referred to and publicized as the "Bra War". Since the sample period extends over 2008, those few quotas are also included in the current analysis.

Under ATC the selection of MFA products to be integrated into the normal WTO system was left to the importing countries/legislatures and the EU started its phasing out processes by integrating mainly products or MFA categories with no quotas vis-à-vis WTO members. During the first two phases, the EU integrated 34 MFA categories, but removed only a few existing quotas vis-à-vis WTO members (OETH, (2000)). For example, among the major exporting countries facing MFA quotas neither India nor Indonesia had any quotas removed in Phase I or II.[7] No quota imposed on imports from Pakistan was removed under Phase II. Only one quota category regulating imports from Pakistan was removed in Phase I, and it had a 0 percent utilization.

In 1998, China's share of T&C import in Denmark was a little over 10 % compared to 2.8 %, 0.7 % and 1.3 % respectively for India, Pakistan and Indonesia. By 2010 China's share reached 32 %, while the respective shares of India, Pakistan and Indonesia were 7 %, 1 %, and 0.3 %.

3.2 Labor Market

Denmark is among the most liberal countries in terms of firing regulations, as firms are not burdened by monetary compensation when firing. In case of lay-offs firms are not required to give advance notification to workers paid on an hourly basis regardless of their tenure. In the Global Competitiveness Report 2013-2014 Denmark is one of a few countries in the world with an estimate of redundancy/firing costs of zero. Provided that the maximum working hours are respected, there are no restrictions regarding weekend or night work.[8] This high level of flexibility of firing and hiring practices is combined with a high level of publicly provided social protection. The system is generally referred as a 'flexicurity' system. In 2006 the Danish employment rate was 77.4 percent (highest among the EU), and the unemployment rate was 3.9 percent (Madsen (2008)).

[7]For Indonesia all active quotas imposed were subject to Phase IV removal except 2 quotas (category 21 and category 33) which were subject to Phase III and were removed in 2002. Also for India there were only 2 quota categories that were subject to Phase III removal in 2002 (category 24 and category 27). The remaining 15 categories for India were removed in 2005.

[8]Denmark follows the same general rules laid out by the EU with a 48 hour maximum working week and a minimum daily rest period of 11 hours.

The social protection that workers enjoy is managed by two parallel administrative systems; one governs active labor market policies (ALMP) and provides unemployment benefits and the other governs active social policies and provides welfare (and unemployment) benefits. The first system is a membership based, voluntary system. If one is a member of the first system (the unemployment insurance fund) then s/he will get generous unemployment benefits when unemployed and is also subject to active labor market programs. Around 80 percent of the labor force is a member of this system (Kluve et al. 2007). Workers who are not part of the unemployment insurance fund receive welfare benefits for as long as they are unemployed. Denmark has a very comprehensive and large scale ALMP which started in the late 1970s and underwent a major reform in 1994. Workers who are part of the unemployment insurance fund have obligations to participate in ALMP offers in order to keep their eligibility status. In 2008 the long term unemployment rate (in total unemployment) was 13.5 % in Denmark, compared to, for example 52.5 and 10.6 % for Germany and the US respectively (OECD Employment Database 2013).

Another characteristic of the Danish labor market is the high union density. The union density rate, which is defined as the number of union members as a ratio of all wage and salary earners in Denmark was 72 % in 2004 as reported by the ICTWSS Database, Version 4 (Visser, 2013). While there is no minimum wage requirement in Denmark, wages are determined by collective wage bargaining agreements to a great extent. The coverage of collective wage bargaining agreements over all wage and salary earners in Denmark were 85 % in 2004. (ICTWSS Database, Version 4 (Visser, 2013))

4 Empirical Strategy

Removal of MFA quotas for China depended on whether and when it would join the WTO. To derive a causal relationship between trade shocks and workers' outcomes, I exploit the exogenous trade shock due to China's accession to the WTO which drove the removal of the MFA quotas. Utar (forthcoming) shows that the MFA quotas were binding for China and both the 2002 and the 2005 abolishments cause a very significant surge of MFA goods from China in Denmark with associated decline in unit prices of these goods. Utar (forthcoming)

also shows that removal of these quotas cause a substantial decline in employment at Danish firms producing MFA goods. Following Utar (forthcoming) but focusing only on the firms that produce these goods domestically, I identify workers that were employed in MFA-good producing firms in 1999, before the WTO accession of China. I start with measuring differential outcomes on labor earnings, income, employment, and unemployment among these workers in comparison to other textile and clothing workers. I start with a simple difference in difference analysis as follows:

$$\ln X_{it} = \alpha_0 + \alpha_1 AffW_{i,99} * Dum02_t + \delta_i + \tau_t + \epsilon_{it} \quad (1)$$

where $Dum02_t = 1$ when year $\geqslant 2002$ and 0 otherwise. X is the worker-level outcome. The treatment variable $AffW_{i,99}$ is an indicator variable that takes value 1 if worker i is employed in 1999 in a firm that domestically produces a product that is subject to the abolishment of the MFA quotas for China in 2002 or in 2005. The treatment variable is interacted with the WTO time dummy, $Dum02_t$, to capture the differential effect on affected workers, employed at firms exposed to increased competition with China due to the MFA quota removals, compared to other T&C workers, employed at firms that were not exposed to increased competition due to the MFA quota removals.[9] The aggregate trends in the industry or in the labor market are controlled for by using year fixed effects, τ_t. It is possible that workers that were employed by the exposed firms are systematically different than the rest of the T&C workers or that the exposed firms were systematically different compared to other T&C firms. All of time-unvarying differences across workers such as gender, occupation, education, initial wage, initial age, including characteristics of their initial workplaces are controlled for by worker fixed effects, δ_i. The coefficient estimates for α_1 will measure the impact of trade shock on workers' outcomes due to the textile quota abolishments starting with China's entry to the WTO in 2002.

[9]Utar (forthcoming) documents a significant overlap between firms that were affected by the two quota removals for China in 2002 and 2005. The majority, 87 percent, of the firms that produced goods subject to 2002 quota removal (Phase I-II-III) were also producing goods subject to 2005 quota removal (Phase IV). Due to the significant overlap among producers of the 2002 and the 2005 quota goods as well as the lack of uncertainty regarding the timing of Phase IV after China's membership of the WTO, it is not possible to identify the impact of the 2002 and 2005 steps of the quota abolishment separately from each other.

Note that the biggest challenge for the studies that rely on industry-wide import measures to identify the impact of trade with China is that industries that are subject to greater import competition may be exposed to other shocks that can be correlated with trade with China. The empirical strategy here is free from this potentially important problem because I focus on a single industry and utilize across firm differences in exposure to trade with China due to an exogenous policy change. The other factors including technology shocks and the secular declining trend in the industry are conditioned out by focusing on the differential outcomes of T&C employees employed by the exposed firms compared to other T&C employees after controlling for aggregate shocks and worker fixed effects. These estimates on the other hand can be viewed as a lower bound of the low-wage competition impact because they are conditioned out of the general declining trend of T&C industry even if this is partly caused by trade factors.

Utar (forthcoming) shows that the MFA quota removal for China leads to a significant decline in employment in firms producing MFA goods. These displaced workers are likely the ones who experience disproportionate decline in their earnings. But they are also expected to move to other jobs, and subsequently partially or fully compensate for their initial loss. The impact that is captured by α_1 is an average impact over the 9 years period. In order to disentangle the impact across different jobs that workers hold subsequently, as well as to get comparable results to the ones reported for the US economy by Autor, Dorn, Hanson and Song (2013), I also use their baseline regression in my context:

$$\tilde{X}_{iT} = \beta_0 + \beta_1 AffW_{i,99} + Z^W_{i,99} + Z^F_{i,99} + \epsilon_{iT} \tag{2}$$

where

$$\tilde{X}_{iT} = \sum_{t=2002}^{T=2010} \frac{X_{it}}{\bar{X}_{it_0}}$$

is the cumulative outcome variable, say wage earnings, over 2002 to 2010, normalized by the average annual outcome over 1999-2000 for worker i employed in the textile and clothing industry as his/her primary employment in 1999.

The vector Z^W contains worker controls: age quartiles, gender, immigration status, occupation categories of the worker in 1999, the education level of the worker in 1999, the logarithm of the

average hourly wage for 1999-2000, and the unemployment history of the worker since 1980 until 1999.[10] The vector Z^F contains controls for the T&C workplace of the worker in 1999: the logarithm of the average hourly wage paid in the workplace in 1999, and the separation rate in 1999 as measured by the percentage of employees that are not employed in the workplace one year to another.

The cumulative outcome embeds the sum of shocks over the periods of abolishment and afterwards. I normalized it by workers' pre-MFA quota abolishment outcome, $\bar{X}_{it_0}$.[11] The estimates of β_1 will capture the cumulative impact of the low-wage import shock due to removal of the MFA quotas over the 9 year period among workers, all of whom were employed by T&C manufacturing firms and have similar demographic-occupational-educational background, wage, unemployment history, and workplace characteristics before the quota abolishment period.

5 Results

5.1 The Impact of Trade Shock on Workers' Future Earnings and Employment

5.1.1 Average Effects

Table 1 presents results from estimating equation 1 for income and employment measures. The sample consists of all employees of the textile and clothing sector in 1999 if the employment relationship is considered as primary (instead of secondary or other types of side jobs) from the perspective of the employee as recorded in November.

The results show that T&C workers that were under direct threat from the MFA removals experienced a significant disproportionate decline in their annual labor income compared to

[10] Occupation categories are top-level and executive positions, intermediate-level occupations, base-level occupations and the outside category which consists of workers with auxiliary occupations or workers with unspecified occupations. Education controls are dummy variables for workers with at least some college education, workers with vocational education and workers with at most a high school degree.

[11] To minimize measurement errors, I normalized it using the 1999-2000 average of the relevant outcome variable.

other T&C workers. The coefficient estimate in Panel A indicates an about 6.5 % decline in annual salary from the primary employment. In Panel B total labor income, which is defined as the summation of all wages earned from all occupations held within a year, is considered. The impact is only a bit less, it is about 5.9 % and significant at the 1 percent. Note that identification of workers that were exposed to the low-wage import competition is based on their primary employment. So even if workers work for their initial employers throughout the sample period, other side jobs held by the worker are not necessarily in a competition-exposed company or even in the same sector. Hence the impact on total wages is expected to be smaller. The salary information is typically reported by the employer. As a robustness check, I also used total salary information which is directly reported by the person to the tax authorities. The D-D coefficient estimate as presented in panel C of Table 1 is quite similar, revealing an about 5.7 % decline. The last income measure considered is the personal income that includes labor income as well as income from self-employment, pension income, government transfers, and other cash benefits excluding wealth/capital income. Unemployed workers receive compensating benefits from their unions and from the government. Part of the adjustment could also involve working as a self-employed, or going into early retirement. The results for annual personal income shows an about 2.3 % decline and indicates that these potentially compensating benefits still do not fully cover the loss in annual labor earnings that was caused by the MFA trade shock.[12]

[12]While the number of observations vary due to availabilities of the variables, when income measures are run on a sample where all other income variables are available, the respective coefficient from Panel A through Panel D are: -0.069^{***}, -0.049^{***}, -0.047^{***}, and -0.030^{***}. In these results (as opposed to the ones presented in Table 1) the sample includes workers as long as they have a primary occupation in November, since otherwise salary information is missing. So workers who are recipients of unemployment insurance or pension benefits are not included in the personal income result (-0.030^{***}).

Table 1: Fixed Effects: Impact of MFA Quota Abolishment on Earnings, and Employment 2002-2010

	Sample: All Workers with primary occupation in T&C sector in 1999	
		AffW ($\widehat{\alpha_1}$)
A	Annual Salary (primary employment)	-0.067***
		(0.011)
B	Total Salaries from all occupations held within a year	-0.061***
		(0.012)
C	Total Salaries from all occupations held within a year- personal tax records	-0.059***
		(0.012)
D	Personal Income including unemployment insurance and other government transfers	-0.023**
		(0.008)
E	Total Annual Hours Worked (primary employment)	-0.045***
		(0.007)
F	Total Annual Hours Worked (all occupations)	-0.089***
		(0.015)
G	Hourly Wage (primary employment)	0.006
		(0.004)
H	Hourly Wage (avg. across all occupations)	0.005
		(0.005)
I	Average No of Days Worked Across All Occupations Within a Year	-0.051***
		(0.010)
J	Cumulative Unemployment Measure	0.098***
		(0.012)

Notes: All regressions include year and person fixed effects. All dependent variables are in logarithmic form. A constant is included but not reported. Due to differences in data sources, and availabilities the number of observations vary. However, to make the magnitude comparisons meaningful, total salary variables obtained from different sources are ran on a common sample. Regression results for personal income only include workers within the labor force. The number of observations from Panel A through Panel J are 117427, 128815, 128815, 147223, 111613, 73497, 111613, 73497, 73467, and 121159 respectively. Data Source: Statistics Denmark.

The negative effect of the MFA shock in labor earnings could be a result of decline in hourly wages as well as a decline in the number of hours worked within a year. Results presented in panel E through H in Table 1 show that the trade shock causes decline in labor earnings through decline in the number of hours worked instead of through hourly wages. Results in Panel I and J show that workers also experience a significant decline in the average number of days employed within a year[13] and the reduction in the number of days worked is not just something voluntary as the significant increase in the unemployment rate shows. On average

[13]While most of the workers have one occupation per year, if a worker works in more than one occupation either because (s)he changes occupation or has additional jobs, this measure shows the average across all occupations.

the import shock caused by dismantling of MFA quotas for China associated with China's WTO accession is found to cause a significant increase in unemployment among Danish T&C workers that were employed at affected firms. These observations invite a closer look at the types of adjustment that displaced workers experienced.

Table 2 presents the estimation results for equation 1 among workers with primary occupations in the T&C sector in 1999 separately across different educational backgrounds: among workers with college education, among workers with skill/vocational education and among workers with at most a (non-technical) high school degree. The results reveal that the impact of the negative shock is not homogeneous across workers with different educational backgrounds. The negative effect is concentrated among workers with lower level of education. The impact of the MFA shock on future earnings among workers with at most a high school diploma is negative and significant. For these workers the results show an about 8.8 % disproportionate decline in primary annual salary and total annual salaries. Even if one considers self-employment as well as unemployment and other government transfers, the impact on income of workers with lower level of education is found to be negative and significant by about 4.3 %. The results on annual hours worked and unemployment reveal that the declines in earnings are due to decline in employment.

The impact of the MFA shock on future employment among workers with vocational training is also found to be very substantial. This group of workers contain high-skilled textile operators, clothing, knitting operators, tailors, etc..Note also that these magnitudes are relative to other textile workers with the same educational backgrounds, hence the impact found here can be considered as a lower bound of the real impact that these workers experience in an industry in decline in Denmark.

The impact of the low-wage import shock on the other hand is not found to be significant on college educated T&C workers. This could be either because college educated T&C workers were not affected significantly at their competition exposed workplaces or because they recovered from the shock fast enough that the average annual effect throughout the 9 year period becomes insignificant. This is be analyzed below.

5.1.2 Cumulative Effect

Table 3 presents estimation results of equation 2 for workers' cumulative earnings, cumulative employment and earnings per year of employment among workers with their primary occupation within the T&C sector in 1999. Column (a) presents the results with no worker and workplace controls and shows negative and significant effect on workers' cumulative earnings measured in initial annual wage. The effect amounts to a little over 72 % of a pre-MFA abolishment annual wage. Results in column (a) of Panel B show no significant relationship with the cumulative employment measure which is the number of years with positive labor earnings. Results in Panel C of column (a) show a negative and significant effect of the trade shock on workers' annual earnings per year of employment.

Workers exposed to the trade shock may be systematically different from other textile workers. After controlling for workers' demographic, occupational, educational differences as well as their past performance (unemployment history, initial wage), and initial workplace characteristics that may have an affect on workers' accumulation of knowledge and experience, coefficients of earnings are significant at the 1 percent level and the coefficient estimate of cumulative employment stay insignificant. Confirming the results obtained with the fixed effects model, these results show that textile workers that were under direct threat from the MFA removals experienced a significant disproportionate decline in their cumulative income compared to other textile workers with the same demographic-occupational-educational-workplace characteristics.

Table 4 presents the results of the same exercise run on a restricted sample that only includes workers with a continuous tenure of a more than a year of full-time occupation at the initial workplace. Results are similar but slightly lower in magnitudes indicating that workers with less stable positions at the initial workplace are affected more negatively by the trade shock. This could be because the group of workers with less stable positions in the T&C sector are more likely to be lower skilled workers. Hence their adjustment to the initial trade shock could be more painful. Note also that even if the main sample includes workers regardless of whether their employment in the T&C sector is full-time or not, the employment in the T&C sector is still their primary attachment to the labor market.

Fixed effects results show that the main channel for the import shock's effect on labor earnings was declining hours worked rather than decline in hourly wages. In addition to the results for cumulative earnings, cumulative employment and earnings per year of employment, column (a) of Table 5 also shows results from the estimation of equation 2 for the dependent variables cumulative hours worked, hours worked per year of employment and hourly rate per year of employment.

While the coefficient estimate for the cumulative employment measure, which is a crude employment measure that shows the number of years with positive earnings,[14] does not show any significance (column a of Panel B), the impact on cumulative earnings (column a of Panel A) is negative and significant by about 70 % of an annual salary. These results are similar to the results obtained in Autor, Dorn, Hanson and Song (2013) for American workers. Autor, Dorn, Hanson and Song (2013) interpret the finding of significant decline in earnings per year with no corresponding decline in the cumulative employment measure as support for the hypothesis that earnings decline via decline in wages instead of employment.

Column (a) of Panel D in Table 5 shows that most of the declines observed in the cumulative earnings of Danish workers are actually due to decline in the cumulative number of hours worked.[15] Results obtained for hours worked per year of employment as well as hourly rate per year of employment as shown in column (a) of Panels E and F reveal that the significant negative effect on the average labor earnings is mainly due to a decline in the number of hours worked within a year, confirming the results obtained with the fixed effect model.[16] These results are in line with the general structure of the Danish labor market where collective bargaining of wages causes downwardly inflexible wages.

[14]Note that since the corresponding earnings measure is annual earnings from a worker's primary employment as recorded in November, both the cumulative employment and the earnings per year of employment measures are based on the primary employment as recorded in November.

[15]The cumulative hours and the hourly rate measures are also based on the primary employment as recorded in November.

[16]It is important to note that information on the number of hours worked and hourly wages is not available for all workers with information on annual salaries, but the strong and robust results obtained across different specifications indicate that the decline in hours worked per year is the main explanation for the decline in per year earnings.

5.2 Workers' Movement Within and Across Sectors

Affected workers are identified by the competition that their initial employers are exposed to. So the impact on the cumulative outcomes contain potentially offsetting effects due to workers' adjustment to the shock by moving across occupations, workplaces, or industries. To analyze the impact of the MFA abolishment on workers' movement, the cumulative measures are decomposed into a set of additive and mutually exclusive channels of adjustment: impact at their initial employers, at other employers in the T&C sector, at other manufacturing sectors, at the service sector and all other sectors which includes agriculture, fishing, etc. These results are presented in columns (b) through (f) in Table 5.

Results in Panel A of Table 5 show that a substantial negative effect on earnings was experienced at the initial employer amounting to 95 % of an initial annual salary. This loss was partially compensated for, such that the overall impact is 69.5 % of an initial annual salary, by workers' movement to service sector jobs and to a small extent also by movement within the sector, although none of these coefficients are found to be significant. Similarly, coefficient estimates in panel B of Table 5 show that the MFA removal caused a significant loss of employment of workers at their initial (affected) employers. Positive and significant coefficients of columns (c) and (e) in Panel B also indicate that affected workers offset their employment loss at the initial firm by moving across jobs within T&C, and to a larger extent by moving to service sector jobs.

Coefficient estimates in Panel C indicate that workers that were exposed to the competition via their initial employers had a significant reduction in their earnings per year not only at their initial employer but also at the service sector jobs that they subsequently moved to. The decline in per year earnings is 2.1 % at the exposed firm but it is 14 % at subsequent service sector jobs. This could be either because they earn less per hour or they work less, maybe because they only find part-time jobs in the service sector. The results presented in Panel D and Panel E of Table 5 confirm that employment has shortened significantly at the initial firm. Column (e) of Panels B, D and E also show that affected workers are more likely to switch to service jobs but they are also more likely to spend less hours in these jobs. More specifically, the MFA shock causes an increase in cumulative hours worked in service sector jobs by about

32 % of pre-abolishment annual hours worked. At the same time, affected workers work 13 % less hours per year in these service sector jobs. Together with the results presented in Panel F on the impact on the hourly wage per year of employment (normalized by the initial hourly wage), they imply that the decline in average earnings observed in the service sector is not because that affected workers find less well-paid (per hour) service sector jobs or because affected workers experience subsequent reductions in their hourly rates, but because they work less. Affected workers may have difficulty in finding full-time service sector occupations or occupations that are suitable to them, and hence they have a higher likelihood of leaving or losing the employment within a year.

Table 6 presents the same exercise conducted for full-time workers with more than one year continuous tenure in the initial T&C workplace in 1999. These results show that workers with more stable positions in the exposed firms had experienced somewhat bigger reductions in their cumulative earnings in the initial workplace, amounting to a little more than one full annual salary. But these workers did better at partially compensating subsequently in service sector jobs. In the service sector they recover close to 70 % of a pre-abolishment annual wage. These findings confirm the above interpretation of Table 4 results that the trade shock had a stronger effect on workers with relatively less stable or part-time initial employment because of the more painful adjustment process that these workers experienced. Autor, Dorn, Hanson and Song (2014) also find that low tenure American workers did worse than high tenure workers in adjusting to the low-wage import shock. The results that the initial negative shock was felt stronger for workers with more stable positions are in line with the general structure of the Danish labor market with very liberal rules for firing as well as with the idea that workers with more stable positions are the ones most likely to have accumulated substantial firm-specific human capital.

The cumulative earnings variable is calculated using the workers' primary employment in November. An alternative definition of the cumulative outcome variables can be based on all occupations, including part-time and side jobs held by workers within a year. Corresponding results that are based on all occupations held by a worker within a year are presented in Table B-1.[17] Table B-2 presents the results with the alternative outcome variables on the restricted

[17]The hourly rate variable that is based on all occupations is a simple average across all occupations held

sample that only includes workers with a continuous tenure of a more than a year of full-time occupation at the T&C industry in 1999. The results are robust.

5.2.1 Dynamics of Workers' Adjustment

In order to see the cumulative impact over time, equation 2 is estimated separately for each year from 2002. In these regressions the cumulative outcome variable is the cumulative sum of the outcome variable from 2002 until the year of the regression normalized by the initial value of the respective outcome variable. Figure 1-(a) shows the coefficient estimates ($\widehat{\beta_1}$) and the confidence interval from the year by year regressions of cumulative earnings. The negative impact on earnings in 2002 is found to be significant. The first phase of the quota abolishment for China was in January 2002 which covered the first three phases of MFA quotas. Workers' outcome variables such as the earnings or hours worked at the primary employment are recorded at the end of the year. So the impact measured in 2002 measures the impact for the whole year in 2002.

Figure 1-(b) shows the coefficient estimates from the decomposition exercise of the cumulative earnings effect. The negative impact at the initial workplace increases in an increasing rate from 2002 until 2005. After that the rate of increase decreases a bit. Evolution of the impact across sectors also reveals that initially workers are able to partially compensate for their loss by switching to other jobs within the same sector. However the contribution of the T&C sector decreases through time especially after 2005. In 2008, the positive cumulative earnings impact at other T&C jobs reaches 0.1 (in initial annual earnings) but the cumulative impact decreases and becomes insignificant in the following years. On the other hand workers are able to compensate better by moving to service sector jobs, especially after 2005. Throughout the period 2002-2010 non T&C manufacturing jobs are not found to be a very important source of earnings compensation.

Figure 2 and Figure 3 show the coefficient estimates ($\widehat{\beta_1}$) from the year by year regressions of the cumulative employment (the number of years with positive salary from workers' primary employment) and the cumulative hours worked in workers' primary employment normalized

within a year.

by the annual hours worked in the initial primary employment.

The impact of the Chinese import shock is found to be negative and significant on cumulative employment until 2005. After that employment improves gradually. Figure 2-(b) reveals that improvement in employment coincides with increased employment in the service sector. Laid-off workers probably first look for jobs within their own sector in order to utilize their sector or occupation specific human capital, but as the industry is shrinking they take employment in the service sector. Figure 3 shows that the decline in the cumulative hours worked flattened a bit after 2005, but it still continued to decrease afterwards. Workers' shorter employment spells or shorter hours in service jobs probably contributed to this.

Figure 4 shows the coefficient estimates from year by year regressions of cumulative income since 1999. Results show that whether a worker was employed by a MFA producer or not did not matter in 1999 or in 2000. In 2001 there is a slight decline in the cumulative income, which may be contributed by voluntary separations. Autor, Dorn, Hanson, and Song (2014) find that high wage workers are more likely to separate from their employers prior to mass layoffs. Note also that China's WTO membership was approved by the WTO Ministerial Conference on November 10 2001 and the worker variables in the IDA database are recorded at the end of November of each year.

5.3 Heterogeneity in Workers' Adjustment

5.3.1 Education

Are all trade exposed workers affected equally at their initial employer? Do they have the same chance of moving between jobs, and compensating for their initial loss subsequently in service sector jobs? Results in the previous section show that on average college educated workers were not significantly affected by the negative trade shock caused by the removal of the MFA quotas. But these results only reveal the average across the 9 year period. It is possible that while college educated workers are in fact influenced by the trade shock, they have fully recovered through subsequent adjustment by the end of the period.

In this section I use the same decomposition exercise conducted in Table 5 separately for college

educated, for workers with vocational education and for workers with at most a (non-technical) high school degree. The results are presented in Table 7 and in Table 8. These results show that college educated workers were at least as heavily hit as workers with lower level of education at the initial employer. The difference between workers with different education levels stemmed from their ability to compensate for the initial loss, incurred due to the low-wage import shock. While all affected workers regardless of their education have higher likelihood of switching to service sector jobs (column (e) of Panel B in Table 7), affected workers with vocational training and affected workers with at most a high school degree are not able to compensate for their earnings loss significantly in the service sector. College educated workers, on the other hand, are able to fully compensate for the earning loss (comparing coefficients in columns (b) and (e) at the first row of Panel A) in service sector jobs. This could be because college educated workers are able to find better paid jobs compared to workers with lower level of education. Results in Panel C of Table 7 show that affected workers with at most a high school degree have significantly lower earnings per year subsequently in the service sector jobs, by about 20 % of an initial annual wage.

Results on cumulative employment also indicate that affected unskilled workers (workers with at most a high school diploma) not only have difficulty in getting good jobs in the service sector but their future employment opportunities within the T&C sector are also worse relative to affected workers with college and vocational education. Results in Panel B of Table 7 show that affected workers with both college and vocational education have higher likelihood of switching to other jobs within the T&C sector but this is not the case for affected workers with at most a high school degree. Results on hourly rates in Panel C of Table 8 show that affected workers with college education receive even higher hourly wages on average in these T&C jobs. Part of the move to other T&C jobs could be thought to be voluntary or self-initiated for college educated workers. These results are in line with Utar (forthcoming) that shows that the removal of MFA quotas triggered restructuring concentrated among MFA importer-producers. These firms increased their ratio of college educated workforce, and the restructuring was associated with increase in wages to college educated workers. Such firms have likely already offshored the domestic production (of MFA protected goods) before the removal of quotas. Employees of exposed firms who were able to switch to importer-producer firms, were probably better able

to utilize their already accumulated industry-occupation specific knowledge.[18]

Panel A of Table 8 shows that for college educated affected workers the increase relative to other college educated T&C workers in the cumulative hours worked in service sector jobs is about 88 % of pre-MFA annual hours worked compared to 31 % and 23 % relative increases for vocational and high school educated affected workers respectively.

Results for hours worked per year of employment presented in Panel B of Table 8 reveal an about 16 % decline in the annual hours worked in the subsequent service sector occupations for affected workers with at most a high school degree.

The results suggest that affected workers with lower level of education face worse future employment opportunities within the T&C sector compared to affected workers with college education. Aggravating their condition, these results indicate that affected workers with lower level of education have a harder time finding 'good' jobs in the service sector compared to their college educated colleagues. Results suggest that jobs that affected workers with lower education find in the service sector are generally part-time or short-term jobs or that they are not as well matched with these jobs and so have a higher likelihood of leaving or losing these jobs.

In recent decades an increase in the employment share of both the top and the lowest skill-level occupations is observed in advanced countries together with a decline in employment in middle-skill level occupations that typically cover many manufacturing functions (Goos, Manning, and Salomons (2009), Autor and Dorn (2013)). The results here imply that a low-wage trade shock to manufacturing sectors and subsequent movement of manufacturing workers to service sector occupations could play an important role in the job polarization observed in advanced countries.

[18]These results are also in line with Hummels, Jørgensen, Munch and Xiang (2014) who show that offshoring is associated with an increased wage premium for high-skilled workers in Denmark.

5.3.2 Occupation

Table 9 and Table 10 present the decomposition analysis separately for workers with different occupations.[19] Results presented in Panel A of Table 9 show that over the 2002-2010 period unskilled workers who were exposed to the shock experienced a decline in their cumulative earnings that is close to two annual salaries (in initial salary) relative to other unskilled T&C workers with similar characteristics. Affected machine operators experienced a decline in their cumulative earnings relative to other T&C machine operators that amounts to about one annual salary. The impact on the cumulative earnings over the 2002-2010 period for managers, workers with professional and technical occupations, clerks and other service workers as well as handcraft workers, on the other hand, is not found to be statistically significant. These results reveal significant heterogeneity of the impact of the low-wage import shock across workers with different occupations.

The extent of the negative shock experienced by unskilled workers and machine operators at their initial exposed workplaces were similar, between 90 to 100 % of a pre-MFA abolishment annual salary. Machine operators consists of workers with occupations such as textile operator, knitting or clothing operator. These occupations were hit hard by the removal of the MFA quotas for China as shown in Utar (forthcoming). Panel B of Table 10 shows that exposed machine operators had a higher likelihood of moving on to other manufacturing jobs as well as to service sector jobs. One expects that all of their occupation-specific knowledge would become obsolete in service jobs. On the other hand, they may partially utilize their initial occupation-specific information in other manufacturing jobs. Kambourov and Manovskii (2009) show that human capital is specific to the occupation in which an individual works and that occupational experience plays an important role in determining wages. Results on cumulative earnings support this idea. Although not statistically significant, machine operators that move to other manufacturing jobs were somewhat able to compensate for their earning loss by about 20 % of a pre-MFA abolishment annual wage, but subsequent movement to the service sector has a negative effect on the cumulative earnings. Unskilled workers fare even worse and experience

[19] Occupation classifications follow International Standard Occupational Classification (ISCO-88) major groupings.

an additional decline in earnings in subsequent jobs of close to one initial annual wage.

Due to the large number of occupation-specific categories, I omitted the analyses for earnings and hours per year of employment, but comparing the estimates for cumulative outcomes on employment, earnings and hours will still provide insight into these outcomes. The ratio of the coefficient estimates of cumulative employment to cumulative earnings indicates that earnings per year of employment decline substantially for machine operators and unskilled workers both overall and especially at subsequent service sector jobs. Results on the cumulative hours presented in Table 10 also suggest that the main margin for the decline in earnings per year is the decline in the number of hours worked.

Piore and Sabel (1984) argues that low-wage competition forces restructuring of manufacturing towards more customized, craft oriented products while relocating mass production to low-wage countries. Utar (forthcoming) documented restructuring in line with this idea in the Danish textile and clothing industry in response to the intensified competition from China. Results presented in Table 9 and Table 10 show that handcraft workers were the least negatively affected group at their exposed workplaces compared to other occupations. The impact on cumulative earnings at the initial workplace is found to be 62 % of a pre-MFA abolishment annual wage and the result is only weakly significant. Craft workers have also been relatively good at compensating for the initial loss subsequently at service sector jobs. This group of workers includes craftsmen, like tailors, so one expects that they had a relatively better skill-match subsequently in jobs in the service sector.

While craft workers are the least affected occupational group at the initial workplace, clerks and other service workers suffered the smallest impact on their cumulative earnings and employment overall over the 9 years. They had been affected at the initial workplace as badly as machine operators in terms of cumulative earnings or as badly as unskilled workers in terms of cumulative employment and hours worked, yet their abilities to recover subsequently were very good. This is most probably because the occupation specific human capital of this group requires the least industry specific knowledge, for example compared to being a machine operator in the T&C sector or being a textile engineer. These findings highlight the importance of heterogeneity in adjustment costs across workers with different occupations. Note also that

we are focusing on differences across occupations controlling for other worker characteristics including education levels or age categories.

5.3.3 Age

Tables 11-12 present the impact of the low-wage import shock due to removal of MFA quotas on cumulative earnings and employment across different age groups and decomposes the impact across a set of mutually exclusive jobs and sectors. Here the early career group consists of workers who in 1999 were between 22 and 35 years old. The mid career group is defined as workers who in 1999 were between 36 and 49 years old and finally the late career group consists of workers who in 1999 were 50 years old or older.[20]

Results in Panel A of Table 11 show that the Chinese import causes cumulative earnings of late-career (50+) workers to decrease significantly by about 86 % of a pre-MFA abolishment annual salary. For mid-career workers (36-49) the impact is 60 % and the cumulative earnings for the younger cohort (22-35) are not found to be affected significantly. Overall effects contain differences in the ability to adjust to the initial shock by age cohorts. Results presented in column b of Panel A in Table 11 show that the impact on the cumulative earnings at the MFA shock exposed workplace was strongest for mid career workers (1.3 initial annual salary), followed by early career workers (0.9 initial annual salary) and late career workers (0.8 initial annual salary) respectively. As mentioned in the previous section, Denmark is among the most liberal countries in terms of firing regulations as firms are not burdened by the monetary compensation or advance notifications in case of lay-offs regardless of the tenure of the employees.[21] The relatively strong initial shock on mid-career workers can be thought to be due to a combination of firms' lack of consideration regarding employees' tenure when laying off as they downsize, and the fact that mid-career workers should have been experiencing the most stable increase in the cumulative earnings/employment at the initial workplace compared

[20] Workers who were younger than 22 years old (youth) in 1999 are not included in this analysis as the number of observations were too low to make a meaningful decomposition analysis.

[21] In Denmark employment can be based on hourly wages which is the most typical form of employment for production workers or on monthly or annual salaries no matter the number of hours worked. The former is exempt from advance notification while employers are still required to give advance notifications for the latter.

to other age groups, had there not been a negative shock.

For all age groups, the likelihood of subsequent employment in the service sector increases due to the low-wage import shock caused by removal of the MFA quotas for China (column e of Panel B in Table 11). For mid career workers the number of years spent in other jobs in the same sector as well as in other manufacturing jobs increases significantly as well by about 1/4 and 1/5 of a year respectively. In terms of earning potentials, while mid career workers are doing relatively better in other jobs in the same sector, early career workers have relatively better earning potentials in service sector jobs, and are able to compensate for 66 % of (0.593/0.896) their initial earning loss in subsequent service jobs while mid and late career workers can only compensate for 19 and 13 % of their initial losses respectively in service jobs. These results are in line with previous findings that younger displaced workers have a faster rate of recovery (Jacobson, LaLonde, and Sullivan (1993)). Results on cumulative hours worked, hours worked per year of employment as well as hourly rate per year of employment presented in Table 12 indicate that mid and late career T&C workers had a hard time getting and keeping service jobs.

5.3.4 Gender

The T&C industry has generally had a high proportion of female workers due to the nature of the manual labor involved (sewing, knitting, cutting, etc..). The ratio of female workers to male workers has been decreasing significantly in Denmark, as well as in other advanced countries, because this kind of labor-intensive occupations have been disproportionately affected by the international production sharing (Olsen, Ibsen, and Westergaard-Nielsen (2004)). However, in 1999 the majority of workers in the Danish T&C industry were still women (Table A-1).

Tables 13 and 14 present the impact of the Chinese import shock due to removal of MFA quotas on workers' outcomes separately for female and male workers. The impact of the negative shock at the exposed workplace on cumulative earnings is similar for both women and men, Panel A of Table 13 indicates. The impacts on cumulative employment and cumulative hours worked at the exposed workplace are found to be slightly lower for women, although the differences are not statistically significant. Earnings per year of employment as well as hours worked

per year of employment at the exposed workplace are found to be negative and significant for women workers only. These results suggest that women workers may be more willing to accept shortened hours worked at the initial workplace compared to men. When we compare the impact at the initial workplace with the overall impact, results reveal that women were not able to recover from the negative shock during the 9 post-MFA years, while men experienced a faster recovery. Despite the finding that both female and male affected workers have higher likelihood of moving to subsequent service sector jobs (column e of Panel B in Table 13), the impact on cumulative earnings at subsequent service sector jobs is basically zero for women while it amounts to 70 % of a pre-MFA annual wage for men. Results presented in Table 14 suggest that this is because subsequently held service sector jobs do not provide longer term stable positions for the female workers.

5.3.5 Size of the Initial Workplace

Table 15 presents results on workers' adjustment depending on the size of the initial employers. For this, workers are partitioned into two groups depending on whether the total annual wages paid by the initial employer is above or below the median level of total annual wages in the sample in 1999. Since the average wage at the initial employer is already controlled for in these regressions (it is part of the vector $Z^F_{i,99}$), this way the potential effect of the size of the initial employer is brought into focus.

Results reveal that the initial trade shock is felt stronger if workers' employers are larger, but displaced workers from larger firms do better in compensating for the loss in subsequent jobs, so the cumulative negative effect over the 9 year period is larger for workers initially employed at small firms. If more people are laid-off in larger affected firms, then it is normal that the initial shock is felt stronger in these firms. International trade models where firm heterogeneity is driven by firm-specific productivity levels predict that low productivity firms (who are also smaller) will be the first ones to be forced to exit or downsize as foreign competition intensifies with trade liberalization. But if low-wage competition forces production of standard goods away from advanced countries, then firms in advanced countries may shift to more specialized products that require closer connection with upstream and downstream industries in order

to protect themselves from 'more efficient' mass producers. This is in line with the type of restructuring that happened in the Danish T&C industry as documented by Utar (forthcoming) in response to the Chinese competition. It is also in line with the findings presented in the previous section that craft workers are relatively less affected by the import shock. Firms that already specialized could be considered to be smaller than firms who have mass production facilities. These firms who have bigger production facilities are more likely to be more affected by the competition. These ideas are also modeled in recent work by Holmes and Stevens (2010).

5.4 Moving Outside of Labor Market?

So far the analysis does not say whether the import shock caused by removal of the MFA quotas drive workers out of the labor force. Workers can move outside of labor market for a variety of reasons including education purposes, family/maternity/health reasons, through prolonged unemployment, or retirement. In Denmark there is an early retirement system that allows people to effectively be retired at the age of 60.[22] It is possible that older workers who were displaced opt for early retirement instead of going through a costly adjustment process.

To see if the low-wage import shock causes an increased incentive to move outside of the labor market, I analyze the impact of the import shock on the number of post-WTO accession years the person spends at a set of mutually exclusive labor market positions:[23] initial employer, other manufacturing jobs (including other T&C jobs), non-manufacturing jobs (mainly in the service sector), self-employed, unemployed, or outside of the labor market. Results for this exercise are presented in Table 15. Results on the cumulative years spent at the initial employer, other manufacturing jobs and non-manufacturing jobs confirm the previous findings that the MFA shock causes workers to spend less time at the initial employer and their likelihood of switching to other manufacturing jobs increases and to service sector jobs even more so. While

[22]In June 2006 the Welfare Agreement was implemented, introducing a gradual rise in the age of early retirement by six months per year from 2019 to 2022, and a gradual rise in pension age within the ordinary scheme by six months per year from 2024 to 2027.

[23]Note that these labor market positions are positions of workers at November of each year as recorded by Statistics Denmark.

I did not make a distinction in this analysis between service and fishing/mining/agriculture jobs, non-manufacturing jobs are overwhelmingly service sector jobs. Results in Table 15 also show that workers who are exposed to the low-wage import shock do not spend more time as self-employed, but they have higher likelihood of being unemployed. A worker has an 'unemployed' labor market status in the database if s/he is unemployed in November and receives unemployment benefit, but is still actively looking for a job. Unemployment benefit is typically administered by the respective unions for insured workers. These workers are also subject to ALMP offers after 12 months of unemployment. If one has a prolonged unemployment (continuously unemployed for 4 years) then this person is no longer considered within the labor market and is not entitled to get unemployment benefit through his/her union anymore.[24] Confirming the results obtained with the fixed effects model, the low-wage import shocks are found to cause higher likelihood of being unemployed.[25] Finally, results presented in Panel F of Table 15 reveals that the MFA shock does not lead to higher likelihood of moving outside of the labor market. This result is in contrast with what is documented for American workers by Autor, Dorn, Hanson and Song (2013). The active labor market policies used in Denmark together with generous unemployment insurance may be one reason behind this difference in outcome.

[24]After four years of unemployment, unemployed people are covered by social assistance benefits specifically for unemployed people which are publicly funded and not as generous.

[25]Notice that the cumulative unemployment measure used in the fixed effects model is a cumulative index measure that shows the summation of the percentage of annual working time spent as unemployed within a year since 1980. So the unemployment measure in this analysis is stricter as a worker who was unemployed within a year is not counted as unemployed if s/he was employed in November of a given year.

Table 15: Labor Market Positions, 2002-2010

	Sample: All Workers with primary occupation in T&C sector in 1999	
Number of years		AffW ($\widehat{\beta_1}$)
A.	at Initial Employer	-0.870***
		(0.056)
B.	at Other Manufacturing Jobs	0.179***
		(0.0524)
C.	at Non-Manufacturing Jobs	0.661***
		(0.057)
D.	as Self-Employed	-0.003
		(0.004)
E.	as Unemployed	0.042**
		(0.016)
F.	Outside of Labor Market	-0.000
		(0.043)

Notes: The number of observations in all panels are 11385. All regressions include a constant and the full set of controls, $Z^W_{i,99}$ and $Z^F_{i,99}$. Data Source: Statistics Denmark.

6 Concluding Remarks

Whether economic and social policies can make a difference in the distributional consequences of globalization and cushion the impact to the most exposed groups of people is an important part of the public debate. Particularly it has been argued that the social systems typical of northern Europe may be better than the American counterpart at easing the burden on the most exposed to global competition. Contributing to the debate, in this paper I analyze the impact of Chinese competition on workers' earnings and employment trajectories in a European country with a generous social net and active labor market policies.

Using employee-employer matched data and exploiting an exogenous abolishment of trade quotas for China associated with its WTO accession, I utilize heterogeneity in workers' exposure to the exogenous trade shock within the same industry. This allows me to disentangle the effects of the trade shock from potentially important technology and demand factors. Results show that the MFA quota abolishment for China has substantial negative impact on Danish workers' earnings and employment trajectories over the period 2002-2010. These results suggest

that trade with low-wage countries is indeed an important factor in shaping the income distribution in advanced countries. Showing that the trade shock with China drives a movement of manufacturing workers to the service sector and the heterogeneity of their future success there, the results also suggest that trade is an important factor contributing to the recent job polarization observed in advanced countries.

A number of interesting features of workers' adjustment to trade shocks are highlighted.

The removal of MFA quotas in conjunction with China's accession to the WTO negatively affects workers in firms exposed to increased competition in the short term regardless of age, gender, education and occupation. The extent of the negative impact and the ability and time needed for workers to recover from it, on the other hand, are crucially dependent on workers' age, education and their initial occupation.

College educated workers, clerks and service workers and younger cohorts are found have the best ability to recover from the initial negative shock. The service sector is the main absorber of displaced workers and the ability of workers to recover from the negative impact of the quota removal appears to depend on how well suited they are for jobs in the service sector. These results point to the importance of short-to-medium term adjustment costs of globalization and inform policy makers about the most vulnerable.

Shorter employment spells are found to be the main channel through which workers are affected from the MFA shock, rather than a decline in their initial and/or subsequent hourly wages. The quota removal causes a higher likelihood of unemployment in affected workers, but does not appear to drive workers out of the labor market altogether. These results allow an informed discussion of whether institutional differences play an important role in shaping the adjustment mechanism.

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Table 2: Fixed Effects: Impact of MFA Shock By Education, 2002-2010

		Workers with:		
		College Education	**Vocational Education**	**at most High School Diploma**
		$(\widehat{\alpha_1})$	$(\widehat{\alpha_1})$	$(\widehat{\alpha_1})$
A.	Annual Salary	-0.056	-0.028	-0.092***
		(0.031)	(0.015)	(0.017)
B.	Annual Salaries (all)	-0.010	-0.036*	-0.092***
		(0.032)	(0.018)	(0.019)
C.	Personal Income	0.018	0.000	-0.044***
		(0.021)	(0.010)	(0.013)
D.	Hours Worked	-0.037*	-0.036***	-0.053***
		(0.018)	(0.010)	(0.010)
E.	Hours Worked (all)	-0.052	-0.086***	-0.110***
		(0.035)	(0.022)	(0.023)
F	Hourly Wage	0.011	0.004	0.010
		(0.014)	(0.007)	(0.006)
G	Hourly Wage (all)	0.017	0.011	-0.001
		(0.015)	(0.007)	(0.007)
H.	Unemployment	0.021	0.083***	0.136***
		(0.032)	(0.020)	(0.017)

Notes: All regressions include year and person fixed effects. All dependent variables are in logarithmic form. A constant is included but not reported. Due to differences in data sources, and availabilities the number of observations vary. The numbers of observations in Panel A are 13561, 40775 and 60440 respectively across columns towards right. Similarly in Panel B, they are 14445, 44326 and 67226. Panel C: 14805, 50104, 78744. Panel D: 13112, 39496, 56494. Panel E: 8601, 25503, 37693. Panel F: 13112, 39496, 56494. Panel G: 8601, 25503, 37693. Panel H: 12322, 40426, 65274. Data Source: Statistics Denmark.

Table 3: MFA Quota Abolishment and Earnings, 2002-2010

Sample: All Workers with primary occupation in T&C sector in 1999				
A. Cumulative Earnings 2002-2010 (in multiples of initial annual wage)				
AffW $(\widehat{\beta_1})$	-0.722***	-0.616***	-0.657***	-0.695***
	(0.190)	(0.179)	(0.175)	(0.175)
Demographic Controls	no	yes	yes	yes
Occupation Types	no	no	yes	yes
Education Levels	no	no	yes	yes
Unemployment History	no	no	yes	yes
Initial Wage	no	no	yes	yes
Initial Workplace Controls	no	no	no	yes
B. Cumulative Employment 2002-2010				
AffW $(\widehat{\beta_1})$	-0.020	0.045	0.005	0.009
	(0.055)	(0.049)	(0.049)	(0.049)
Demographic Controls	no	yes	yes	yes
Occupation Types	no	no	yes	yes
Education Levels	no	no	yes	yes
Unemployment History	no	no	yes	yes
Initial Wage	no	no	yes	yes
Initial Workplace Controls	no	no	no	yes
C. Earnings per Year of Employment 2002-2010 (in initial annual wage)				
AffW $(\widehat{\beta_1})$	-0.123***	-0.121***	-0.125***	-0.132***
	(0.026)	(0.025)	(0.024)	(0.024)
Demographic Controls	no	yes	yes	yes
Occupation Types	no	no	yes	yes
Education Levels	no	no	yes	yes
Unemployment History	no	no	yes	yes
Initial Wage	no	no	yes	yes
Initial Workplace Controls	no	no	no	yes

Notes: In Panel A, B, and C the number of observations are 11385, 11385, and 10595 respectively. A constant is included but not reported. Demographic controls are gender dummy, immigration status dummy, and age quartiles. Occupation types are indicator variables whether an individual was employed in 1999 having a high-level, intermediate-level, base level, or auxiliary/unspecified occupation (outside category). Education levels are dummy variables indicating whether an individual has at most high school degree, vocational training (after high school) or college and above degree in 1999. Unemployment history is the number of years between 1980-1999 that the individual spent as an unemployed person. Initial wage is the logarithm of the average hourly wage of an individual (from his/her primary occupation in T&C) in 1999 and 2000. Initial workplace controls are the logarithm of the average hourly wage in the workplace in 1999, and the separation rate in 1999 (percentage of employees that left the workplace). Data Source: Statistics Denmark.

Table 4: MFA Quota Abolishment and Earnings, 2002-2010

Sample: All Full-Time Workers with primary occupation in T&C sector				
for more than a year continuous tenure in the workplace in 1999				
A. Cumulative Earnings 2002-2010 (in multiples of initial annual wage)				
AffW ($\widehat{\beta_1}$)	-0.320**	-0.255*	-0.319**	-0.339**
	(0.121)	(0.115)	(0.115)	(0.117)
Demographic Controls	no	yes	yes	yes
Occupation Types	no	no	yes	yes
Education Levels	no	no	yes	yes
Unemployment History	no	no	yes	yes
Initial Wage	no	no	yes	yes
Initial Workplace Controls	no	no	no	yes
B. Cumulative Employment 2002-2010				
AffW ($\widehat{\beta_1}$)	-0.142*	-0.059	-0.078	-0.067
	(0.067)	(0.060)	(0.060)	(0.060)
Demographic Controls	no	yes	yes	yes
Occupation Types	no	no	yes	yes
Education Levels	no	no	yes	yes
Unemployment History	no	no	yes	yes
Initial Wage	no	no	yes	yes
Initial Workplace Controls	no	no	no	yes
C. Earnings per year of employment 2002-2010 (in initial annual wage)				
AffW ($\widehat{\beta_1}$)	-0.036**	-0.040**	-0.047***	-0.052***
	(0.013)	(0.013)	(0.013)	(0.013)
Demographic Controls	no	yes	yes	yes
Occupation Types	no	no	yes	yes
Education Levels	no	no	yes	yes
Unemployment History	no	no	yes	yes
Initial Wage	no	no	yes	yes
Initial Workplace Controls	no	no	no	yes

Notes: In Panel A, B, and C the number of observations are 7465, 7465, and 6960 respectively. A constant is included but not reported. Demographic controls are gender dummy, immigration status dummy, and age quartiles. Occupation types are indicator variables whether an individual was employed in 1999 having a high-level, intermediate-level, base level, or auxiliary/unspecified occupation (outside category). Education levels are dummy variables indicating whether an individual has at most high school degree, vocational training (after high school) or college and above degree in 1999. Unemployment history is the number of years between 1980-1999 that the individual spent as an unemployed person. Initial wage is the logarithm of the average hourly wage of an individual (from his/her primary occupation in T&C) in 1999 and 2000. Initial workplace controls are the logarithm of the average hourly wage in the workplace in 1999, the separation rate in 1999 (percentage of employees that left the workplace). Data Source: Statistics Denmark.

Table 5: MFA Quota Abolishment and Earnings, 2002-2010

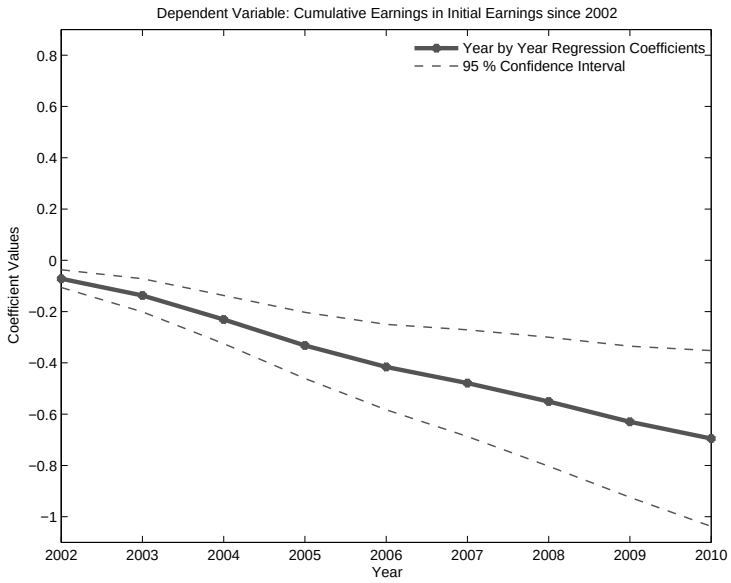
Workers with primary occupation in T&C sector in 1999						
	(a)	(b)	(c)	(d)	(e)	(f)
	All	Initial Firm	other T&C	other Manuf	Service	The Rest
	A. Cumulative Earnings 2002-2010 (in initial annual wage)					
AffW $(\widehat{\beta_1})$	-0.695***	-0.950***	0.068	-0.074	0.290	-0.029
	(0.175)	(0.067)	(0.060)	(0.085)	(0.161)	(0.045)
	B. Cumulative Employment 2002-2010					
AffW $(\widehat{\beta_1})$	0.009	-0.870***	0.131***	0.080	0.661***	0.007
	(0.049)	(0.056)	(0.038)	(0.041)	(0.055)	(0.019)
	C. Earnings per year of Employment 2002-2010 (in initial annual wage)					
AffW $(\widehat{\beta_1})$	-0.132***	-0.021*	-0.040	-0.112	-0.140***	-0.025
	(0.024)	(0.009)	(0.032)	(0.064)	(0.039)	(0.097)
	D. Cumulative Hours Worked 2002-2010 (in initial annual hours worked)					
AffW $(\widehat{\beta_1})$	-0.547***	-0.910***	0.096*	-0.037	0.324**	-0.019
	(0.114)	(0.060)	(0.047)	(0.067)	(0.101)	(0.031)
	E. Hours Worked per year of Employment 2002-2010 (in initial annual hours)					
AffW $(\widehat{\beta_1})$	-0.102***	-0.017**	-0.046*	-0.088*	-0.130***	-0.070
	(0.015)	(0.006)	(0.020)	(0.039)	(0.026)	(0.078)
	F. Hourly Rate per year of Employment 2002-2010 (in initial hourly rate)					
AffW $(\widehat{\beta_1})$	-0.004	-0.009	0.018	-0.015	0.016	0.023
	(0.007)	(0.006)	(0.011)	(0.015)	(0.011)	(0.031)

Notes: In Panels A, B and D, the number of observations are 11385. In Panels C, E, and F the number of observations are decreasing from 10595, 10481, and 10481 respectively in columns a through f. All regressions include the full set of controls. A constant is included but not reported. The full set of controls are demographic controls (age, gender, immigration status), occupation types, education levels, unemployment history, initial wage and the initial workplace controls as described in tablenotes of Tables 3-4. Data Source: Statistics Denmark.

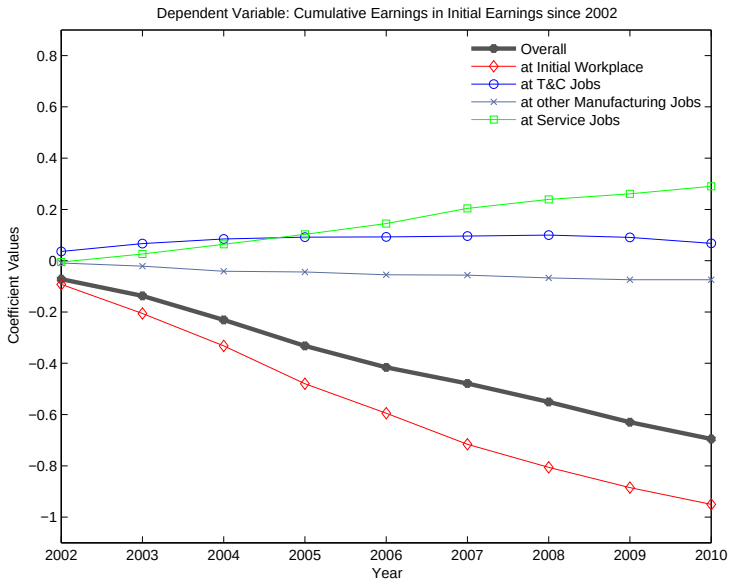
Table 6: MFA Quota Abolishment and Earnings, 2002-2010 : All Occupations

Workers with full-time primary occupation in T&C sector in 1999 with more than a year continuous tenure						
	(a)	(b)	(c)	(d)	(e)	(f)
	All	Initial Firm	other T&C	other Manuf	Service	The Rest
	A. Cumulative Earnings 2002-2010 (in initial annual wage)					
AffW $(\widehat{\beta_1})$	-0.339**	-1.141***	0.089	0.040	0.681***	-0.007
	(0.117)	(0.082)	(0.056)	(0.077)	(0.100)	(0.031)
	B. Cumulative Employment 2002-2010					
AffW $(\widehat{\beta_1})$	-0.067	-1.049***	0.121*	0.083	0.772***	0.006
	(0.060)	(0.074)	(0.048)	(0.050)	(0.066)	(0.022)
	C. Earnings per year of Employment 2002-2010 (in initial annual wage)					
AffW $(\widehat{\beta_1})$	-0.052***	-0.018**	0.001	-0.055	-0.002	0.005
	(0.013)	(0.007)	(0.019)	(0.043)	(0.023)	(0.076)
	D. Cumulative Hours Worked 2002-2010 (in initial annual hours worked)					
AffW $(\widehat{\beta_1})$	-0.407***	-1.060***	0.106*	0.038	0.522***	-0.012
	(0.092)	(0.074)	(0.050)	(0.064)	(0.078)	(0.029)
	E. Hours Worked per year of Employment 2002-2010 (in initial annual hours)					
AffW $(\widehat{\beta_1})$	-0.059***	-0.011*	-0.002	-0.047	-0.053**	-0.065
	(0.010)	(0.005)	(0.014)	(0.032)	(0.018)	(0.069)
	F. Hourly Rate per year of Employment 2002-2010 (in initial hourly rate)					
AffW $(\widehat{\beta_1})$	0.009	-0.006	0.009	0.001	0.045***	0.053
	(0.007)	(0.006)	(0.012)	(0.016)	(0.012)	(0.033)

Notes: In Panels A, B, and D the number of observations are 7465. In Panels C, E, and F, the number of observations are decreasing from 6960, 6895, and 6895 respectively in columns a through f. All regressions include the full set of controls. A constant is included but not reported. The full set of controls are demographic controls (age, gender, immigration status), occupation types, education levels, unemployment history, initial wage and the initial workplace controls as described in tablenotes of Tables 3-4. Data Source: Statistics Denmark.



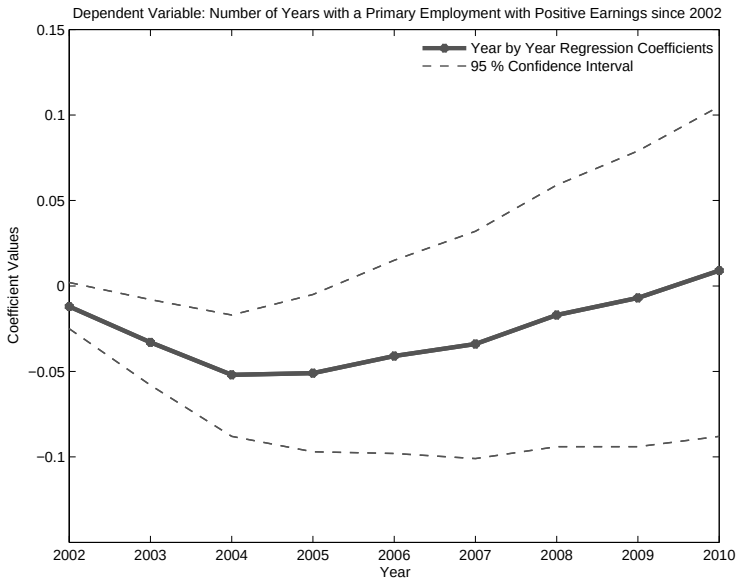
(a) Overall Impact



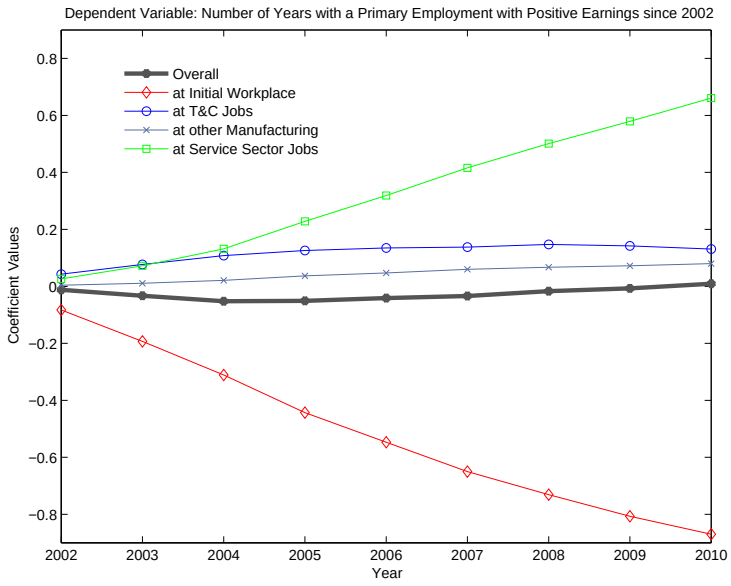
(b) Sectoral Decomposition

Figure 1: Year by Year Impact on the Cumulative Earnings

All regressions include a constant and the full set of controls, $Z^W_{i,99}$ and $Z^F_{i,99}$.



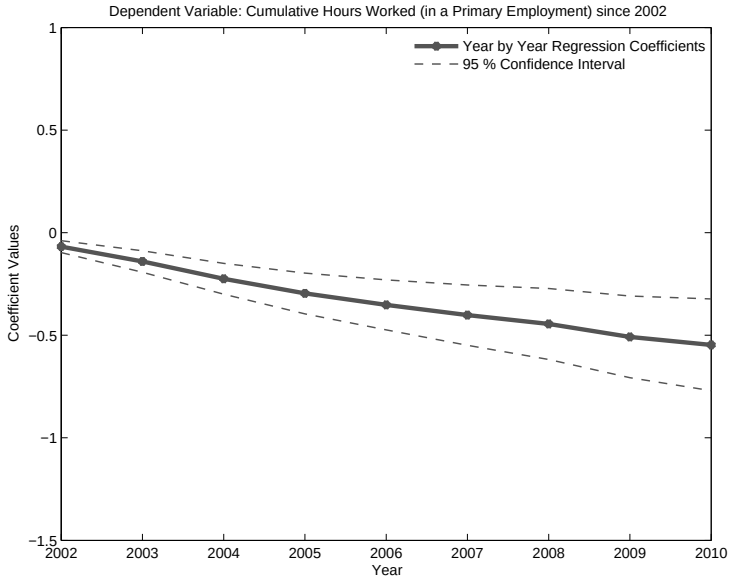
(a) Overall Impact



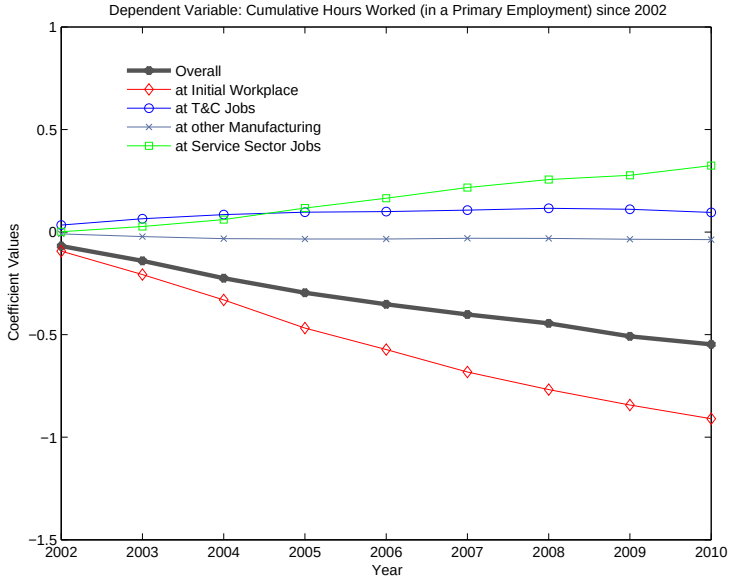
(b) Sectoral Decomposition

Figure 2: Year by Year Impact on the Cumulative Employment

All regressions include a constant and the full set of controls, $Z^W_{i,99}$ and $Z^F_{i,99}$.



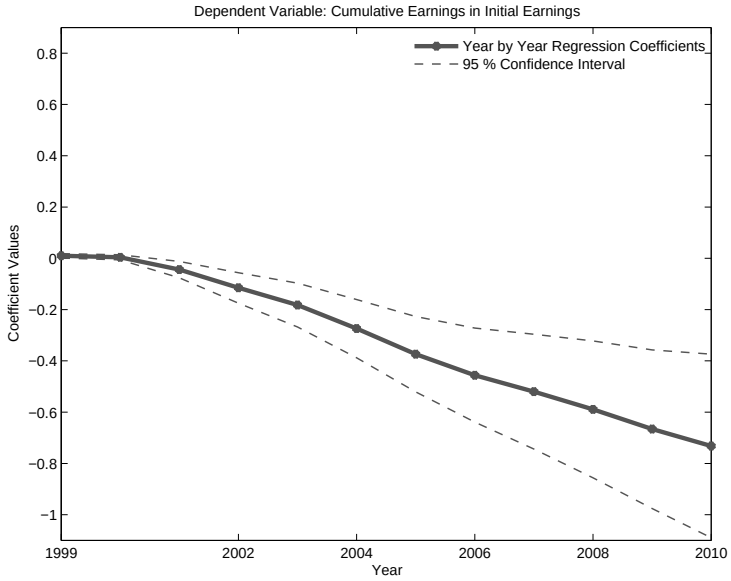
(a) Overall Impact



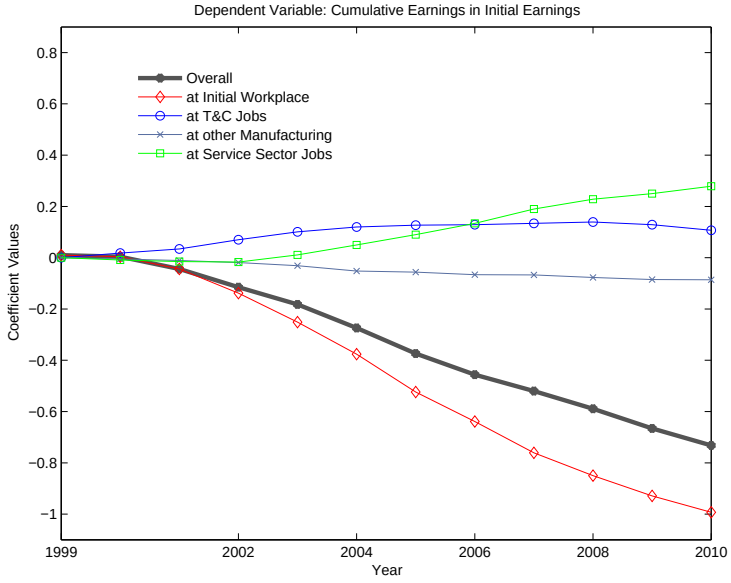
(b) Sectoral Decomposition

Figure 3: Year by Year Impact on the Cumulative Hours Worked

All regressions include a constant and the full set of controls, $Z^W_{i,99}$ and $Z^F_{i,99}$.



(a) Overall Impact



(b) Sectoral Decomposition

Figure 4: Year by Year Impact on the Cumulative Earnings Since 1999

All regressions include a constant and the full set of controls, $Z^W_{i,99}$ and $Z^F_{i,99}$.

Table 7: Workers' Movement by Education I, 2002-2010

Workers with primary occupation in T&C sector in 1999						
	(a)	(b)	(c)	(d)	(e)	(f)
	All	Initial Firm	other T&C	other Manuf	Service	The Rest
	A. Cumulative Earnings 2002-2010 (in initial annual wage)					
College	0.145	-1.117***	0.161	-0.261	1.302**	0.060
	(0.491)	(0.231)	(0.253)	(0.253)	(0.435)	(0.050)
Vocational	-0.532*	-1.030***	0.120	0.072	0.305	-0.000
	(0.233)	(0.111)	(0.095)	(0.109)	(0.207)	(0.079)
High School	-1.019***	-0.834***	0.007	-0.159	0.024	-0.057
	(0.286)	(0.090)	(0.082)	(0.143)	(0.266)	(0.069)
	B. Cumulative Employment 2002-2010					
College	0.174	-0.930***	0.334**	-0.340*	1.054***	0.056
	(0.127)	(0.186)	(0.121)	(0.137)	(0.173)	(0.047)
Vocational	-0.097	-0.955***	0.201**	0.081	0.579***	-0.004
	(0.082)	(0.097)	(0.066)	(0.066)	(0.094)	(0.033)
High School	0.055	-0.781***	0.042	0.157**	0.623***	0.013
	(0.071)	(0.075)	(0.052)	(0.057)	(0.076)	(0.026)
	C. Earnings per year of Employment 2002-2010 (in initial annual wage)					
College	-0.031	-0.033	-0.088	0.036	-0.056	-0.053
	(0.058)	(0.031)	(0.107)	(0.138)	(0.090)	(0.214)
Vocational	-0.079**	-0.013	-0.046	-0.005	-0.098	0.101
	(0.030)	(0.012)	(0.053)	(0.069)	(0.050)	(0.176)
High School	-0.197***	-0.025	-0.025	-0.195	-0.196**	-0.110
	(0.041)	(0.015)	(0.045)	(0.106)	(0.065)	(0.130)

Notes: In Panels A and B, the number of observations are 1234, 3994 and 5885 respectively for college, vocational and high school rows. In Panel C, the number of observations are decreasing from 1195 (college), 3713 (vocational) and 5336 (high school) respectively. All regressions include a constant and the full set of controls, $Z^W_{i,99}$ and $Z^F_{i,99}$ except the controls for education levels as the regressions are ran within education levels samples. Data Source: Statistics Denmark.

Table 8: Workers' Movement by Education II, 2002-2010

Workers with primary occupation in T&C sector in 1999						
	(a)	(b)	(c)	(d)	(e)	(f)
	All	Initial Firm	other T&C	other Manuf	Service	The Rest
	A. Cumulative Hours Worked 2002-2010 (in initial annual hours worked)					
College	-0.036	-1.002***	0.271	-0.242	0.878**	0.058
	(0.339)	(0.199)	(0.189)	(0.203)	(0.304)	(0.047)
Vocational	-0.505**	-1.005***	0.143	0.076	0.310*	-0.028
	(0.169)	(0.103)	(0.080)	(0.089)	(0.156)	(0.058)
High School	-0.638***	-0.801***	0.030	-0.076	0.232	-0.022
	(0.174)	(0.080)	(0.062)	(0.109)	(0.147)	(0.043)
	B. Hours Worked per year of Employment 2002-2010 (in initial annual hours)					
College	-0.025	-0.027	-0.080	0.027	-0.068	0.135
	(0.041)	(0.020)	(0.079)	(0.112)	(0.064)	(0.167)
Vocational	-0.076***	-0.017	-0.071*	-0.008	-0.101**	-0.011
	(0.022)	(0.009)	(0.033)	(0.047)	(0.038)	(0.122)
High School	-0.130***	-0.013	-0.024	-0.145*	-0.157***	-0.150
	(0.024)	(0.010)	(0.028)	(0.063)	(0.040)	(0.117)
	C. Hourly Rate per year of Employment 2002-2010 (in initial hourly rate)					
College	0.017	0.035	0.075*	-0.029	0.027	0.036
	(0.018)	(0.025)	(0.037)	(0.044)	(0.027)	(0.077)
Vocational	-0.001	-0.006	0.017	-0.005	0.013	0.020
	(0.008)	(0.009)	(0.017)	(0.018)	(0.015)	(0.037)
High School	-0.019	-0.020*	0.009	-0.037	0.005	0.022
	(0.011)	(0.008)	(0.016)	(0.025)	(0.017)	(0.048)

Notes: In Panel A the number of observations are 1234, 3994 and 5885 respectively for college, vocational and high school rows. In Panels B and C the number of observations are decreasing from 1195(college), 3713 (vocational), and 5336 (high school), respectively. All regressions include a constant and the full set of controls, $Z^W_{i,99}$ and $Z^F_{i,99}$ except the controls for education levels as the regressions are ran within education levels samples. Data Source: Statistics Denmark.

Table 9: Workers' Movement by Occupation I, 2002-2010

Workers with primary occupation in T&C sector in 1999						
	(a)	(b)	(c)	(d)	(e)	(f)
	All	Initial Firm	other T&C	other Manuf	Service	The Rest
	A. Cumulative Earnings 2002-2010 (in initial annual wage)					
Managers	-0.353	-1.019***	0.097	-0.246	0.736*	0.079
	(0.385)	(0.301)	(0.206)	(0.241)	(0.292)	(0.058)
Profs and Techs	-0.286	-0.851***	0.425*	-0.512**	0.599	0.054
	(0.386)	(0.203)	(0.174)	(0.186)	(0.367)	(0.049)
Clerks	0.000	-0.992***	0.342*	0.320	0.364	-0.035
	(0.599)	(0.223)	(0.141)	(0.196)	(0.604)	(0.130)
Craft Workers	-0.338	-0.624*	-0.142	0.008	0.536*	-0.116
	(0.335)	(0.249)	(0.159)	(0.237)	(0.256)	(0.112)
Machine Operators	-0.979***	-1.020***	-0.118	0.198	-0.061	0.022
	(0.214)	(0.092)	(0.085)	(0.121)	(0.190)	(0.054)
Unskilled Workers	-1.914**	-0.908***	0.244	-0.622*	-0.359	-0.268
	(0.694)	(0.170)	(0.192)	(0.314)	(0.663)	(0.209)
	B. Cumulative Employment 2002-2010					
Managers	-0.291	-0.988***	0.002	-0.102	0.747***	0.050
	(0.231)	(0.268)	(0.172)	(0.147)	(0.215)	(0.062)
Profs and Techs	0.175	-0.775***	0.459***	-0.385***	0.822***	0.054
	(0.125)	(0.168)	(0.110)	(0.109)	(0.163)	(0.035)
Clerks	0.203	-0.758***	0.259**	0.154	0.537**	0.011
	(0.115)	(0.171)	(0.097)	(0.101)	(0.169)	(0.048)

Notes: The number of observations are 624 (managers), 1557 (professionals and technicians), 1429 (clerks and other service workers), 965 (craftsmen), 4923 (machine operators), and 1827 (unskilled workers) rows. All regressions include a constant and the full set of controls, $Z^W_{i,99}$ and $Z^F_{i,99}$ except the control for occupations categories as the regressions are ran within occupation samples. Data Source: Statistics Denmark.

Table 10: Workers' Movement by Occupation II, 2002-2010

Workers with primary occupation in T&C sector in 1999						
	(a)	(b)	(c)	(d)	(e)	(f)
	All	Initial Firm	other T&C	other Manuf	Service	The Rest
	A. Cumulative Employment 2002-2010					
Craft Workers	0.127	-0.691**	0.033	0.168	0.650***	-0.034
	(0.177)	(0.215)	(0.131)	(0.166)	(0.172)	(0.079)
Machine Operators	-0.074	-0.944***	0.001	0.314***	0.503***	0.053
	(0.081)	(0.083)	(0.059)	(0.069)	(0.082)	(0.029)
Unskilled Workers	0.068	-0.785***	0.254*	-0.014	0.707***	-0.095
	(0.120)	(0.131)	(0.099)	(0.093)	(0.144)	(0.058)
	B. Cumulative Hours Worked 2002-2010 (in initial annual hours worked)					
Managers	-0.265	-1.093***	0.086	-0.064	0.735**	0.070
	(0.325)	(0.272)	(0.212)	(0.170)	(0.280)	(0.065)
Profs and Techs	-0.293	-0.741***	0.446**	-0.451**	0.411	0.042
	(0.290)	(0.176)	(0.145)	(0.144)	(0.284)	(0.043)
Clerks	-0.044	-0.876***	0.323**	0.219	0.347	-0.057
	(0.352)	(0.190)	(0.118)	(0.151)	(0.354)	(0.110)
Craft Workers	-0.259	-0.669**	-0.109	0.043	0.552*	-0.077
	(0.277)	(0.228)	(0.153)	(0.203)	(0.219)	(0.088)
Machine Operators	-0.754***	-0.981***	-0.070	0.147	0.108	0.042
	(0.169)	(0.087)	(0.073)	(0.123)	(0.133)	(0.039)
Unskilled Workers	-0.806*	-0.822***	0.242*	-0.248	0.191	-0.168
	(0.355)	(0.141)	(0.118)	(0.160)	(0.331)	(0.115)

Notes: The number of observations are 624 (managers), 1557 (professionals and technicians), 1429 (clerks and other service workers), 965 (craftsmen), 4923 (machine operators), and 1827 (unskilled workers) rows. All regressions include a constant and the full set of controls, $Z^W_{i,99}$ and $Z^F_{i,99}$ except the control for occupations categories as the regressions are ran within occupation samples. Data Source: Statistics Denmark.

Table 11: Workers' Movement By Age I, 2002-2010

Workers with primary occupation in T&C sector in 1999						
	(a)	(b)	(c)	(d)	(e)	(f)
	All	Initial Firm	other T&C	other Manuf	Service	The Rest
	A. Cumulative Earnings 2002-2010 (in initial annual wage)					
Early Career	-0.381	-0.896***	0.077	-0.115	0.593*	-0.039
	(0.326)	(0.122)	(0.127)	(0.185)	(0.299)	(0.077)
Mid Career	-0.600**	-1.267***	0.194*	0.157	0.238	0.077
	(0.205)	(0.116)	(0.090)	(0.116)	(0.191)	(0.049)
Late Career	-0.861***	-0.770***	-0.126	-0.007	0.097	-0.054
	(0.166)	(0.105)	(0.082)	(0.069)	(0.097)	(0.065)
	B. Cumulative Employment 2002-2010					
Early Career	0.140*	-0.767***	0.138*	0.035	0.748***	-0.015
	(0.070)	(0.096)	(0.068)	(0.081)	(0.103)	(0.038)
Mid Career	0.044	-1.175***	0.258***	0.196**	0.731***	0.034
	(0.069)	(0.103)	(0.072)	(0.074)	(0.095)	(0.029)
Late Career	-0.288*	-0.702***	-0.001	0.033	0.372***	0.010
	(0.117)	(0.101)	(0.059)	(0.049)	(0.081)	(0.025)
	C. Earnings per year of Employment 2002-2010 (in initial annual wage)					
Early Career	-0.092*	-0.037	-0.016	-0.057	-0.099	0.022
	(0.042)	(0.021)	(0.060)	(0.100)	(0.059)	(0.136)
Mid Career	-0.096***	-0.007	-0.035	0.011	-0.113**	0.129
	(0.025)	(0.011)	(0.032)	(0.050)	(0.040)	(0.121)
Late Career	-0.135***	-0.039**	-0.158*	-0.054	-0.137**	0.047
	(0.023)	(0.014)	(0.077)	(0.083)	(0.049)	(0.134)

Notes: In Panels A and B, the number of observations are 3869, 4077 and 2921 respectively for early, mid and late career age groups. In Panel C, the number of observations are decreasing from 3791 (early career), 3970 (mid career) and 2322 (late career) respectively. The early career group is defined as workers who in 1999 were between 22 and 35 years old. The mid career group is defined as workers who in 1999 were between 36 and 49 years old and finally the late career group consists of workers who in 1999 were 50 years old or older. All regressions include a constant and the full set of controls, $Z^W_{i,99}$ and $Z^F_{i,99}$ except the controls for age groups as the regressions are ran within age group samples. Data Source: Statistics Denmark.

Table 12: Workers' Movement By Age II, 2002-2010

Workers with primary occupation in T&C sector in 1999						
	(a)	(b)	(c)	(d)	(e)	(f)
	All	Initial Firm	other T&C	other Manuf	Service	The Rest
	A. Cumulative Hours Worked 2002-2010 (in initial annual hours worked)					
Early Career	-0.236	-0.848***	0.113	-0.073	0.604**	-0.032
	(0.208)	(0.105)	(0.094)	(0.135)	(0.195)	(0.054)
Mid Career	-0.496**	-1.230***	0.211*	0.128	0.349*	0.046
	(0.153)	(0.108)	(0.085)	(0.104)	(0.145)	(0.037)
Late Career	-0.708***	-0.699***	-0.060	-0.009	0.115	-0.054
	(0.150)	(0.101)	(0.063)	(0.065)	(0.095)	(0.059)
	B. Hours Worked per year of Employment 2002-2010 (in initial annual hours)					
Early Career	-0.066*	-0.040**	-0.041	-0.064	-0.081*	-0.050
	(0.028)	(0.014)	(0.042)	(0.056)	(0.040)	(0.085)
Mid Career	-0.081***	-0.005	-0.021	0.003	-0.098***	0.044
	(0.018)	(0.009)	(0.027)	(0.042)	(0.028)	(0.101)
Late Career	-0.114***	-0.021*	-0.093**	-0.081	-0.152**	0.027
	(0.019)	(0.010)	(0.033)	(0.081)	(0.050)	(0.168)
	C. Hourly Rate per year of Employment 2002-2010 (in initial hourly rate)					
Early Career	-0.012	0.007	0.031	-0.011	-0.004	-0.029
	(0.013)	(0.011)	(0.021)	(0.027)	(0.017)	(0.035)
Mid Career	-0.000	-0.008	0.002	-0.005	0.014	0.088*
	(0.007)	(0.007)	(0.013)	(0.016)	(0.012)	(0.039)
Late Career	-0.013	-0.022	-0.004	0.007	-0.000	0.098
	(0.011)	(0.014)	(0.024)	(0.030)	(0.025)	(0.071)

Notes: In Panel A the number of observations are 3869, 4077 and 2921 respectively for early, mid and late career age groups. In Panels B and C the number of observations are decreasing from 3776 (early career), 3954 (mid career), and 2245 (late career), respectively. The early career group is defined as workers who in 1999 were between 22 and 35 years old. The mid career group is defined as workers who in 1999 were between 36 and 49 years old and finally the late career group consists of workers who in 1999 were 50 years old or older. All regressions include a constant and the full set of controls, $Z^W_{i,99}$ and $Z^F_{i,99}$ except the controls for age groups as the regressions are ran within age group samples. Data Source: Statistics Denmark.

Table 13: Workers' Movement By Gender I, 2002-2010

Workers with primary occupation in T&C sector in 1999						
	(a)	(b)	(c)	(d)	(e)	(f)
	All	Initial Firm	other T&C	other Manuf	Service	The Rest
	A. Cumulative Earnings 2002-2010 (in initial annual wage)					
Female	-1.028***	-0.945***	-0.024	-0.101	0.035	0.007
	(0.242)	(0.087)	(0.087)	(0.119)	(0.221)	(0.042)
Male	-0.321	-0.960***	0.175*	-0.124	0.692**	-0.105
	(0.267)	(0.112)	(0.080)	(0.130)	(0.251)	(0.091)
	B. Cumulative Employment 2002-2010					
Female	-0.008	-0.799***	0.091	0.102*	0.574***	0.023
	(0.067)	(0.073)	(0.048)	(0.049)	(0.075)	(0.018)
Male	-0.006	-0.942***	0.169**	0.026	0.761***	-0.019
	(0.074)	(0.089)	(0.062)	(0.072)	(0.083)	(0.039)
	C. Earnings per year of Employment 2002-2010 (in initial annual wage)					
Female	-0.189***	-0.050***	-0.106*	-0.224*	-0.198***	0.044
	(0.033)	(0.014)	(0.053)	(0.090)	(0.048)	(0.130)
Male	-0.055	0.007	0.027	0.032	-0.046	-0.052
	(0.035)	(0.014)	(0.037)	(0.077)	(0.069)	(0.132)

Notes: In Panels A and B, the number of observations are 6406 and 4979 respectively for female and male worker groups. In Panel C, the number of observations are decreasing from 5889 (female) and 4706 (male) respectively. All regressions include a constant and the full set of controls, $Z^W_{i,99}$ and $Z^F_{i,99}$ except the dummy variable for gender as the regressions are ran within the same gender group samples. Data Source: Statistics Denmark.

Table 14: Workers' Movement By Gender II, 2002-2010

Workers with primary occupation in T&C sector in 1999						
	(a)	(b)	(c)	(d)	(e)	(f)
	All	Initial Firm	other T&C	other Manuf	Service	The Rest
	A. Cumulative Hours Worked 2002-2010 (in initial annual hours worked)					
Female	-0.714***	-0.869***	0.037	-0.075	0.197	-0.004
	(0.172)	(0.079)	(0.063)	(0.106)	(0.146)	(0.035)
Male	-0.318*	-0.942***	0.167*	-0.024	0.533***	-0.053
	(0.145)	(0.094)	(0.069)	(0.093)	(0.136)	(0.055)
	B. Hours Worked per year of Employment 2002-2010 (in initial annual hours)					
Female	-0.142***	-0.031**	-0.079*	-0.192**	-0.167***	-0.154
	(0.023)	(0.010)	(0.032)	(0.068)	(0.035)	(0.116)
Male	-0.038*	0.001	-0.013	0.038	-0.057	0.018
	(0.019)	(0.008)	(0.023)	(0.044)	(0.036)	(0.095)
	C. Hourly Rate per year of Employment 2002-2010 (in initial hourly rate)					
Female	-0.017*	-0.013	0.002	-0.010	-0.008	0.038
	(0.009)	(0.007)	(0.016)	(0.021)	(0.013)	(0.037)
Male	0.007	-0.007	0.031	-0.024	0.052*	0.018
	(0.011)	(0.011)	(0.017)	(0.020)	(0.020)	(0.045)

Notes: In Panel A the number of observations are 6406 and 4979 respectively for female and male workers. In Panels B and C the number of observations are decreasing from 5830 (female) and 4651 (male), respectively. All regressions include a constant and the full set of controls, $Z^{W}_{i,99}$ and $Z^{F}_{i,99}$ except the dummy variable for gender as the regressions are ran within the same gender group samples. Data Source: Statistics Denmark.

Table 15: Workers' Adjustment By Initial Firm Size, 2002-2010

Workers with primary occupation in T&C sector in 1999						
	(a)	(b)	(c)	(d)	(e)	(f)
	All	Initial Firm	other T&C	other Manuf	Service	The Rest
	A. Cumulative Earnings 2002-2010 (in initial annual wage)					
Above Median	-0.166	-1.550***	0.265***	0.012	1.073***	0.033
	(0.207)	(0.100)	(0.067)	(0.136)	(0.176)	(0.063)
Below Median	-0.716**	-0.342***	0.026	-0.207	-0.063	-0.129*
	(0.276)	(0.101)	(0.099)	(0.126)	(0.259)	(0.058)
	B. Cumulative Employment 2002-2010					
Above Median	0.004	-1.419***	0.302***	0.114	0.959***	0.048
	(0.070)	(0.082)	(0.052)	(0.065)	(0.077)	(0.030)
Below Median	-0.010	-0.260**	0.052	-0.017	0.260**	-0.046
	(0.075)	(0.085)	(0.061)	(0.055)	(0.083)	(0.024)
	A. Cumulative Hours Worked 2002-2010 (in initial annual hours worked)					
Above Median	-0.316*	-1.452***	0.306***	-0.017	0.807***	0.041
	(0.153)	(0.088)	(0.059)	(0.119)	(0.125)	(0.042)
Below Median	-0.542**	-0.326***	0.017	-0.159	0.031	-0.106**
	(0.184)	(0.090)	(0.076)	(0.108)	(0.160)	(0.039)

Notes: The number of observations are 6025, and 5360 respectively for above median and below median groups in all panels. Above median group consists of workers who had been employed in initial workplace with total wages that is above the median across all workplaces in the sample in 1999. Below median group consists of workers who had been employed in initial workplace with total wages that is below the median across all workplaces in the sample in 1999. All regressions include a constant and the full set of controls, $Z^W_{i,99}$ and $Z^F_{i,99}$. Data Source: Statistics Denmark.

Appendix A

Table A-1: Worker Characteristics in 1999: Demographics

	AffW	Age	Female	Immigrant	Experience
Whole Sample: All T&C workers employed in 1999					
Mean	0.446	39.987	0.557	0.063	13.855
N	13008	13008	13008	13008	13008
Restricted Sample: Full-Time T&C workers employed in 1999					
Mean	0.475	40.813	0.549	0.065	14.938
N	10985	10985	10985	10985	10985
Restricted Sample: Full-Time, more than 1 year continuous tenure					
Mean	0.471	42.006	0.523	0.055	15.740
N	7829	7829	7829	7829	7829

Variables AffW, Female, and Immigrant are worker-level indicator variables. The variable AffW takes value 1 when a worker's primary employer domestically produces an MFA good. The variable Experience shows the number of years since 1980 that a worker worked as an employee (paid ATP). Data Source: Statistics Denmark.

Table A-2: Worker Characteristics in 1999: Occupation, Education and Wages I

	High-Level Occupations	Mid-Level Occupations	Base-Level Occupations	Log Hourly Wage
Whole Sample: All T&C workers employed in 1999				
Mean	0.087	0.118	0.610	4.970
N	13008	13008	13008	11833
Restricted Sample: Full-Time T&C workers employed in 1999				
Mean	0.070	0.133	0.656	4.991
N	10985	10985	10985	10849
Restricted Sample: Full-Time, more than 1 year continuous tenure				
Mean	0.083	0.143	0.637	5.006
N	7829	7829	7829	7819

Variables High-Level, Mid-Level and Base-level Occupations are worker-level indicator variables that take value 1 if a worker's primary employment is classified under the respective occupation category. The variable Hourly Wage is only calculated for individuals with high quality data as indicated by Statistics Denmark. Values are expressed in constant year 2000 Danish Kroner. Data Source: Statistics Denmark.

Table A-3: Worker Characteristics in 1999: Occupation, Education and Wages II

	College + Education	Vocational Education	High School − Education	Log Annual Salary
Whole Sample: All T&C workers employed in 1999				
Mean	0.105	0.341	0.529	11.973
N	13008	13008	13008	12686
Restricted Sample: Full-Time T&C workers employed in 1999				
Mean	0.113	0.362	0.499	12.172
N	10985	10985	10985	10985
Restricted Sample: Full-Time, more than 1 year continuous tenure				
Mean	0.116	0.373	0.487	12.373
N	7829	7829	7829	7829

Variables College +, Vocational and High School − Education are worker-level indicator variables that take value 1 if a worker's highest educational attainment is classified under the respective category. Values are expressed in constant year 2000 Danish Kroner. Data Source: Statistics Denmark.

Table A-4: Workplace Characteristics in 1999

Whole Sample: All T&C workers employed in 1999					
	No. of Employees	Log Avg. Hourly Wage	Negative Trend	Positive Trend	Separation Rate
Mean	114.918	5.027	0.441	0.236	27.227
N	12949	12770	12709	12709	12935
Restricted Sample: Full-Time T&C workers employed in 1999					
Mean	122.387	5.038	0.449	0.222	25.829
N	10942	10908	10819	10819	10942
Restricted Sample: Full-Time, more than 1 year continuous tenure					
Mean	126.316	5.041	0.471	0.204	24.257
N	7829	7827	7789	7789	7829

Variables Negative Trend and Positive Trend are indicator variables. The variable Negative Trend takes value 1 if a worker's main employer's size has decreased more than 5 percent relative to November 1998. Similarly, the variable Positive Trend takes value 1 if a worker's main employer's size has increased more than 5 percent relative to November 1998. The variable Separation Rate is the rate at which employees leave a worker's main workplace (defined as percentages). The variable No. of Employees is the number of people that have been employed by a worker's employer during the year. Values are expressed in constant year 2000 Danish Kroner. Data Source: Statistics Denmark.

Appendix B

Table B-1: MFA Quota Abolishment and Total Labor Earnings, 2002-2010

Workers with primary occupation in T&C sector in 1999						
	(a)	(b)	(c)	(d)	(e)	(f)
	All	Initial Firm	other T&C	other Manuf	Service	The Rest
	A. Cumulative Earnings 2002-2010 (in initial annual wage)					
AffW ($\widehat{\beta_1}$)	-0.519***	-0.949***	0.058	0.006	0.419***	-0.054
	(0.136)	(0.066)	(0.055)	(0.068)	(0.123)	(0.042)
	B. Cumulative Employment 2002-2010					
AffW ($\widehat{\beta_1}$)	0.042	-0.870***	0.130***	0.078	0.661***	0.043
	(0.045)	(0.056)	(0.038)	(0.041)	(0.055)	(0.026)
	C. Earnings per year of Employment 2002-2010 (in initial annual wage)					
AffW ($\widehat{\beta_1}$)	-0.086***	-0.026**	-0.037	-0.067	-0.110***	-0.058**
	(0.016)	(0.009)	(0.028)	(0.042)	(0.031)	(0.021)
	D. Cumulative Hours Worked 2002-2010 (in initial annual hours worked)					
AffW ($\widehat{\beta_1}$)	-2.146***	-0.782*	0.019	-0.515*	-0.725*	-0.143
	(0.579)	(0.332)	(0.144)	(0.263)	(0.348)	(0.083)
	E. Hours Worked per year of Employment 2002-2010 (in initial annual hours)					
AffW ($\widehat{\beta_1}$)	-0.456***	-0.076	-0.030	-0.479*	-0.926***	-0.198
	(0.114)	(0.140)	(0.142)	(0.202)	(0.224)	(0.171)
	F. Hourly Rate per year of Employment 2002-2010 (in initial hourly rate)					
AffW ($\widehat{\beta_1}$)	0.006	-0.003	-0.006	-0.008	0.026	-0.009
	(0.007)	(0.007)	(0.014)	(0.015)	(0.013)	(0.015)

Notes: In Panels A and B the number of observations are 11385. In Panel D the number of observations are 7602. In Panels C, E, and F, the number of observations are decreasing from 10935, 6859, and 6859 respectively in columns a through f. All regressions include the full set of controls and a constant. The full set of controls includes demographic controls, occupation types, education levels, unemployment history, initial wage and initial workplace controls. Demographic controls are gender dummy, immigration status dummy, and age quartiles. Occupation types are indicator variables whether an individual was employed in 1999 having a high-level, intermediate-level, base-level and auxiliary/unspecified occupation (outside category). Education levels are dummy variables indicating whether an individual has at most high school degree, vocational training (after high school) or college and above degree in 1999. Unemployment history is the number of years between 1980-1999 that the individual spent as an unemployed person. Initial wage is the logarithm of the average hourly wage of an individual (from his/her primary occupation in T&C) in 1999 and 2000. Initial workplace controls are the logarithm of the average hourly wage in the workplace in 1999, and the separation rate in 1999 (percentage of employees that left the workplace). Data Source: Statistics Denmark.

Table B-2: MFA Quota Abolishment and Total Labor Earnings, 2002-2010

Workers with full-time primary occupation in T&C sector in 1999 with more than one year tenure						
	(a)	(b)	(c)	(d)	(e)	(f)
	All	Initial Firm	other T&C	other Manuf	Service	The Rest
	A. Cumulative Earnings 2002-2010 (in initial annual wage)					
AffW ($\widehat{\beta_1}$)	-0.211	-1.151***	0.093	0.080	0.744***	0.023
	(0.109)	(0.082)	(0.055)	(0.067)	(0.099)	(0.029)
	B. Cumulative Employment 2002-2010					
AffW ($\widehat{\beta_1}$)	-0.036	-1.049***	0.117*	0.081	0.764***	0.052
	(0.055)	(0.074)	(0.048)	(0.049)	(0.066)	(0.030)
	C. Earnings per year of Employment 2002-2010 (in initial annual wage)					
AffW ($\widehat{\beta_1}$)	-0.029*	-0.020**	0.013	-0.022	0.003	0.010
	(0.012)	(0.007)	(0.017)	(0.035)	(0.022)	(0.017)
	D. Cumulative Hours Worked 2002-2010 (in initial annual hours worked)					
AffW ($\widehat{\beta_1}$)	-1.734**	-0.927	0.086	-0.156	-0.673	-0.066
	(0.673)	(0.511)	(0.064)	(0.173)	(0.377)	(0.037)
	E. Hours Worked per year of Employment 2002-2010 (in initial annual hours)					
AffW ($\widehat{\beta_1}$)	-0.293*	-0.093	0.065	-0.237	-0.853**	-0.171*
	(0.127)	(0.178)	(0.053)	(0.155)	(0.270)	(0.080)
	F. Hourly Rate per year of Employment 2002-2010 (in initial hourly rate)					
AffW ($\widehat{\beta_1}$)	0.016*	0.000	0.006	0.013	0.038*	0.010
	(0.008)	(0.007)	(0.016)	(0.017)	(0.018)	(0.019)

Notes: In Panels A and B the number of observations are 7465. In Panel D, the number of observations are 5097. In Panels C, E, and F, the number of observations are decreasing from 7184, 4635, and 4635 respectively in columns a through f. All regressions include the full set of controls and a constant. The full set of controls includes demographic controls, occupation types, education levels, unemployment history, initial wage and initial workplace controls. Demographic controls are gender dummy, immigration status dummy, and age quartiles. Occupation types are indicator variables whether an individual was employed in 1999 having a high-level, intermediate-level, base-level and auxiliary/unspecified occupation (outside category). Education levels are dummy variables indicating whether an individual has at most high school degree, vocational training (after high school) or college and above degree in 1999. Unemployment history is the number of years between 1980-1999 that the individual spent as an unemployed person. Initial wage is the logarithm of the average hourly wage of an individual (from his/her primary occupation in T&C) in 1999 and 2000. Initial workplace controls are the logarithm of the average hourly wage in the workplace in 1999, and the separation rate in 1999 (percentage of employees that left the workplace). Data Source: Statistics Denmark.