

Workers beneath the Floodgates: Impact of Low-Wage Import Competition and Workers' Adjustment

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I analyze the impact of a low-wage trade shock on manufacturing workers in a high-wage country, Denmark, and their subsequent adjustment to the shock. Employing a comprehensive person-level panel dataset matched with workplace-level employer data for the period 1999 to 2010, I exploit the dismantling of import quotas on Chinese textile and clothing products in conjunction with China's accession to the WTO as a quasi-natural experiment and utilize 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 main channels through which the trade shock affects workers are shortened employment at the firm that was exposed to the competition shock and subsequent difficulty in maintaining stable employment. The abolishment of quotas also leads to higher likelihood of unemployment. The service sector is the main absorber of exposed workers of all types, but the success of recovery from the shock in subsequent service sector jobs varies greatly across workers depending on initial occupation, education and age. Less-educated, older and workers who had occupations with a high industry-specific skill content at the exposed firms had the worst adjustment experience. The results show that trade-induced adjustment costs are substantial and heterogeneous across different types of workers and highlight the nature of adjustment frictions by showing that, for some, challenges remain even after transitioning to full-time jobs outside of manufacturing.

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1 Introduction

A negative economic shock to an industry can have long lasting consequences for its employees. It has been shown that involuntary job displacement due to plant downsizing can have lasting negative effect on workers' earnings for years after the event and can even have non-pecuniary negative effects such as reduced life expectancy.¹ Many observers today ask whether the recent rise of China in global trade which coincides with a decline in labor-intensive manufacturing in advanced countries, is a shock that will have similar consequences, and how workers and society can best adjust to the shock individually and in terms of policy. China's rapid integration to the world economy fortified by its WTO accession has played a major role in a general dramatic increase in trade between advanced and developing countries over the last two decades. From 1999 to 2011 China's share in external imports of the EU-15 grew from 6 % to 14 %, and in 2006 China replaced the US as the most important import supplier to the EU-15.²

Recent research has made great strides in understanding the consequences of raising trade with low-wage countries, particularly with China, on firms and industries and documented significant labor reallocation as a result (e.g. Bernard, Jensen, Schott (2006), Bloom, Draca, Van Reenen (2011), Autor, Dorn, Hanson (2013), Utar and Torres-Ruiz (2013), Utar (2014), Pierce and Schott (2014)). However these studies do not address how manufacturing workers adjust when they are displaced from their workplaces due to competition with China. If workers can efficiently switch to another job within the same industry, the earnings consequences (and broader welfare consequences) are small. But what are the options available to workers and what are their adjustment costs in reality when facing low-wage import competition? How do adjustment strategies and costs differ across workers with different educations and occupations or different personal characteristics such as age? And to what degree can social and labor market policies facilitate workers' adjustment and cushion the impact of the import shock?

¹Jacobson, LaLonde and Sullivan (1993) finds that workers involuntarily displaced by plant downsizing in Pennsylvania during the recession of the early 1980s suffered annual average earnings losses of 25 percent, even six years following displacement. Sullivan and von Wachter (2009) finds that the short-term mortality rates of involuntarily displaced workers approximately doubled and their life expectancy was reduced by one to one and a half years on average.

²Author's calculation based on EuroStat trade database.

The answer to these questions not only inform public debate but also helps policy makers pursue pro-globalization policies that are sustainable in the long run.³ Very recently Autor, Dorn, Hanson and Song (2014) made significant progress on this and 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.⁴ Contributing to the literature on workers' adjustment to trade shocks, in this paper I analyze the effects 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 in conjunction with its accession to the WTO 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, income and employment trajectories. Focusing on the expiration of the MFA quotas in the textile and clothing industry (T&C) not only provides a clear experiment, but the T&C industry, as a classic labor-intensive manufacturing industry, is also very suitable for studying the import shock from China (Bloom, Draca, and Van Reenen (2011), Utar (2014)).

I follow workers employed in the T&C sector in 1999 over the period 2002 to 2010, and examine how they adjust to the globalization shock due to the removal of MFA quotas for China. Using domestic production data at the detailed product level, 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

³Recently it has been argued that Europeans are doing better at easing the burden on the most exposed to Chinese competition in comparison to the US. (NYTimes, Feb 2, 2012, Chrystia Freeland)

⁴For a recent empirical contribution on workers' adjustment see also Menezes-Filho and Muendler (2011)'s analysis on Brazilian workers' response to trade liberalization.

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 and within-industry heterogeneity in exposure to the resulting import competition. By using a comparison group of workers employed, ex-ante, in the same industry with similar characteristics and facing the same technological and demand shocks, this study is able to disentangle the impact of the trade shock on workers' outcomes from potentially important other forces, such as technological progress, and thus to derive causal implications.

The MFA quotas, while economically important and substantial (Khandelwal, Schott and Wei (2013), Bloom, Draca, Van Reenen (2011), Brambilla, Khandelwal and Schott (2010), Utar (2014)), concern only textile and clothing products. The empirical literature on labor reallocation in response to trade shocks mostly focus on economy-wide trade liberalization episodes.⁵ When examining labor reallocation following general trade liberalization episodes, general equilibrium effects and spill-overs from other industries normally convolute results.⁶ In addition to helping establish causality, utilizing removal of MFA quotas to examine workers' adjustment to a low-wage import shock also helps relieving such concerns.

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. Earnings losses amount to on average 70 % of an initial annual wage after 9 years of the post-WTO period. 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 employment spells 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 shorter employment at the firm that was exposed to the competition shock and subsequent difficulty in maintaining stable employment.

⁵Among the notable examples in this literature see, for example, Wacziarg and Wallack (2004) for a cross-country study of labor reallocation that uses aggregate data and Menezes-Filho and Muendler (2011) that uses worker-level data from Brazil.

⁶In the context of developing countries, Goldberg and Pavcnik (2007) also points out that most governments often implement trade reforms concurrent with other economy-wide policy changes, making it even harder to isolate the effects of trade.

The results presented in this paper provide a point of comparison to the adjustment of American workers to the Chinese trade shock described by Autor, Dorn, Hanson, and Song (2014), from another advanced country with a Nordic social system. 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 the reductions in per year earnings, they document, 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 liberal hiring-firing regulations (as in the US) with a high degree of unionization⁷ and allow an informed discussion of whether institutional differences play an important role in shaping the adjustment mechanism.

Earlier literature investigating the question of whether trade with lower wage countries was an important factor in driving the increase in income inequality observed in many advanced countries in the 1980s and 1990s did not find strong empirical support in comparison to alternative explanations such as technology factors.⁸ Studies in this literature mostly focus on wage changes within the manufacturing sector, 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.⁹

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

⁷The 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.

⁸In 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)).

⁹Contribution to this literature includes Revenga (1992), Hanson and Harrison (1999) among others. Among the recent contributions on trade's impact on workers' wages, Ebenstein, Harrison, McMillan and Phillips (2014) examines the wage effect of trade across occupations and arrive the same conclusion.

by the import shock via their employment at a firm exposed to the competition. However, adjustment to the shock after displacement was found to differ significantly depending on worker characteristics. Particularly college educated workers have an easier time finding alternative jobs in the service sector that 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 successful in finding and, more importantly, 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 fare better in subsequent service sector jobs compared to older cohorts. These results elucidate the importance of short-to-medium-run adjustment costs of globalization and inform policy makers about the most vulnerable.

Danish workers were relatively mobile between jobs and sectors, and jobs in the service sector proved to be important for recovering from the initial loss of earnings and employment. Yet for mid-aged and older workers, unskilled workers and skilled workers with industry-specific occupational human capital the earnings recovery was slow and incomplete throughout the nine post-shock years. Autor, Dorn, Hanson and Song (2014) show that low-wage workers tend to stay within manufacturing where they were repeatedly exposed to the import shock and identify being able to move out of manufacturing jobs as an important factor in determining the success of American workers' adjustment to the Chinese import shock. What is found to be critical in Danish workers' adjustment process was not inability to move to service sector jobs but rather inability to keep/have stable employment there. The active labor market policies in Denmark may be one reason behind relatively mobile Danish workers. But these results also show that being able to move to the service sector, which is relatively protected from trade shocks, is not enough to secure smooth recovery, especially for workers who would need to make a substantial change in their human capital to function in the new environment.

This paper complements studies that use a structural approach to workers' adjustment to trade shocks. Using structural empirical models some studies aim at recovering trade adjustment costs that workers face (e.g. Artuc, Chaudhuri and McLaren (2010), Dix-Carneiro (2014)) or focus on efficiency implications of labor market frictions (e.g. Utar (2009) and Cosar (2013)), and others

analyze 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 empirically inform structural studies in modeling workers’ adjustment. In particular, they show that adjustment costs differ substantially across workers with different age, education and occupation and the costs that workers face are not limited to difficulty or slowness in getting into other jobs in growing sectors. Workers face substantial adjustment costs in their new environment as they try to adjust to their new jobs and sectors. This study also helps to shed lights on the influence of different labor market institutions on workers’ adjustment.

The paper is organized as follows. In the next section, I describe data used in this study and lay out the framework of the empirical analyses with background information on the MFA quotas and Danish social and labor market institutions. A description of the empirical strategy is provided in section 3. I present and discuss my results on the impact of the trade shock on workers’ earnings, employment and income and their subsequent adjustment to the shock in section 4. Section 5 looks at possible contributions from self-employment, government transfers and movement outside of the labor market, followed by concluding remarks in section 6. Supplemental analyses to the ones presented in the paper and a more detailed description of the data-sets are provided in an online appendix.

2 Data and Empirical Framework

2.1 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 working age 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 salary, hourly salary, hours worked, industry code for their primary employment, the occupational status in the primary employment, education level, demographic characteristics such as age, gender and immigration status, and total salaries obtained from all jobs held within a year. VARES is used to identify firms with domestic production in one or more of the goods that were subject to the MFA quotas for China. This survey aims at providing information on industrial goods (at the 8 digit Combined Nomenclature (CN) level) that are produced within the country and is collected as part of the industrial commodity production statistics (PRODCOM). Firms that in 1999 produce 8-digit CN level goods that are subject to the MFA quota removal for China are identified and through FIDA, the firm identification numbers are mapped with worker-level information.

The IDA database provides information on hours worked as well as detailed occupation and education levels of employees. This facilitates an analysis that disentangles the effect of changes in hours worked from the effect of changes in hourly wages on workers' per year earnings. It also allows me to carefully examine the adjustment experience in relation to workers' initial occupation and education. The fact that the IDA database contains information on everybody in the labor force gives substantial advantages over random samples or matched employee-employer data limited to workers who are formally employed. It allows me to conduct a detailed study of the effect of a policy change on the workers of a single industry and their adjustment to the change as they move into other jobs, industries and in and out of the labor market. Arguably, this provides the most true to life look at how people are affected and adjust, when the environment in which they make their living is substantially transformed by globalization.

The IDA database contains information on every person regardless of their labor market status as long as they are between 15 and 74 years old. There are around 13,000 workers employed in the T&C sector in 1999. For the purpose of this study I select all workers with primary employment in the T&C sector in 1999 who were of working age throughout the sample period. That is, only workers who were between 20 and 67 years old throughout the 2002-2010 period are considered. Table A-1 presents sample information from the 1999-cross section of workers'

demographic, education, occupation and workplace characteristics. The average worker was 39 years old in 1999. Immigrants constituted 7 % of the sample and female workers constituted 57 %. 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 steadily in Denmark as well as in other advanced countries since the 1980s, 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.

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 1999.¹⁰ After matching MFA quota information with worker-level information, 46 % of the sample were identified as employees of T&C firms that were domestically producing one or more products that were subject to MFA quotas for China in 1999.

2.2 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. Under this agreement a large portion of T&C export from low-wage developing countries to developed countries was subject to physical quotas. The arrangement provided 'temporary' protection for developed country T&C industry

¹⁰Annex 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 (2014) with a difference that quotas for China that were extended until the beginning of 2008 are also included in this study. See footnote 12.

against competition from low-wage country products.¹¹ 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 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 2005.¹²

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)). The exporting countries with the highest quota utilization were China, India, Pakistan and Indonesia. Among the major exporting countries facing MFA quotas neither India nor Indonesia had any quotas removed in Phase I or II.¹³ ¹⁴ No quota imposed on imports from Pakistan was removed under Phase II. Only one

¹¹The MFA was initially agreed on for four years, but it was extended several times until 1995 (Spinanger (1999)).

¹²Due 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.

¹³For Indonesia all active quotas imposed were subject to Phase IV removal except two quotas (category 21 and category 33) which were subject to Phase III removal and were removed in 2002. Also for India there were only two quota categories that were subject to Phase III removal in 2002 (category 24 and category 27). The remaining fifteen categories for India were removed in 2005.

¹⁴The exporting countries with the highest quota utilization were China, India, Pakistan and Indonesia (OETH, 2000).

quota category regulating imports from Pakistan was removed in Phase I, and it had a 0 percent utilization. Quotas covered a wide range of both textile and clothing products ranging from bed linens to synthetic filament yarns to shirts but at the same time coverage within each broad product category varied, making it important to utilize MFA quotas at a detailed product-level. See the online appendix for more details.

The abolishment of the quotas for China led to a dramatic surge in Chinese T&C imports into the formerly protected countries. 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. Figure A-1 in the appendix shows the evolution in T&C import shares of China compared to other developing countries subject to MFA quotas. By 2010 China's share reached 32 %, while the respective shares of India, Pakistan and Indonesia were 7 %, 1 %, and 0.3 %. The image of floodgates opening is an apt one. Using transaction-level import data, Utar (2014) 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. Khandelwal, Schott, and Wei (2013) shows that the abolishment of quotas for China lead to an efficiency gain in Chinese exports finds that misallocation of the MFA quotas by the Chinese government during the quota regime played an important role in the resulting surge of lower priced Chinese goods in response to the removal of these quotas for China.

2.3 Labor Market

The labor market in Denmark is characterized by liberal hiring and firing regulations. Firms are not burdened by monetary compensation when firing. In case of lay-offs they are not required to give advance notification to workers paid on an hourly basis regardless of their tenure.¹⁵ 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

¹⁵For hourly paid workers employed under collective bargaining agreements, in principle such agreements may contain provisions for tenure dependent advance notification.

are respected, there are no restrictions regarding weekend or night work.¹⁶ 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 to 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)).

The social protection that workers enjoy is managed by two parallel administrative systems; one governs unemployment insurance and active labor market policies (ALMP) 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 (UI), 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). 87 % of the workers in the sample were members of the unemployment insurance fund in 1999 (Table A-1). 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. In Denmark the union density rate, defined as the number of union members as a ratio of all wage and salary earners, was 72 % in 2004 (Visser, 2013). The unionization rate in the sample was 76 % in 1999 (Table A-1). While there is no minimum wage requirement in Denmark, wages are to a great extent determined by collective wage bargaining agreements. The coverage of collective wage bargaining agreements over all wage and salary earners in Denmark was 85 % in 2004. (Visser, 2013)

¹⁶Denmark 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.

3 Empirical Strategy

While the ATC provided a schedule for gradual dismantling of MFA quotas already in 1995, removal of MFA quotas for China depended on whether and when it would join the WTO.¹⁷ 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 (2014) shows that removal of these quotas cause a substantial decline in employment at Danish firms producing MFA goods. Following Utar (2014) 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 in labor earnings, income, hours and days worked, hourly wages and unemployment among these workers in comparison to other textile and clothing workers using a simple difference in difference (DID) 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 ≥ 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.¹⁸ The aggregate trends in the industry and in the labor market are

¹⁷During the long period of China's negotiation for WTO membership, mainly with the US and EU, there was a great deal of uncertainty about the membership and its timing. "China's entry into the WTO is far from a foregone conclusion. It has been trying to join the multilateral trading system since 1986. Its hopes have been disappointed many times before."—quoted from an article titled "China and WTO" published in the Economist on April 1, 1999. This uncertainty was a recurring theme in articles in the Economist from 1999 until the end of 2001. See also The Economist (2000a) and The Economist (2000b).

¹⁸Utar (2014) 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

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 from other T&C firms. All 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 for China starting with its entry into the WTO in 2002.

An important challenge for empirical strategies 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. For example, advances in communication technology or in transportation that lower the cost of offshoring would affect labor-intensive industries more, driving up their import from China disproportionately. The empirical strategy here is free from this potential contamination because I focus on a single industry and utilize within-industry 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 workers 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 the T&C industry even if this is partly caused by trade factors.

Utar (2014) shows that the MFA quota removal for China leads to a significant decline in employment in firms producing MFA goods. In the presence of labor market frictions, the displaced workers from these firms are likely the ones who experience disproportionate decline in their earnings. But they will also switch 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 (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.

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 (2014), I use their baseline regression in my context:

$$\tilde{X}_{iT} = \beta_0 + \beta_1 AffW_{i,99} + Z_{i,99}^W + Z_{i,99}^F + \epsilon_{iT} \quad (2)$$

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, 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, labor market experience, union membership, unemployment insurance membership and the unemployment history of the worker since 1980 until 1999.¹⁹ 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 contains 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} .²⁰ 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

¹⁹Occupation 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 (non-technical) high school degree. The labor market experience variable is the number of years the worker has been in the labor market since 1980. The unemployment history of the worker is the cumulative sum of the percentage of working time spent as unemployed within each year since 1980.

²⁰To reduce measurement errors, I normalize it using the 1999-2000 average of the relevant outcome variable.

history, and workplace characteristics before the quota abolishment period. I will then examine workers' adjustment by decomposing the cumulative effect captured by β_1 across different jobs that workers hold subsequently.

The treatment variable is a zero-one dummy which gives equal weight to workers as long as their initial workplaces were producing any 8-digit MFA-quota goods. But many firms are multi-product firms. It is possible that some firms produce some quota goods domestically while offshoring others. Utar (2014) shows that such firms are less negatively affected by the removal of quotas for China. Some firms may have an insignificant revenue share in quota products. To address this I also construct a continuous treatment variable using the revenue share of domestically produced MFA quota goods. Let $CAffW_{i99}$ be the revenue share of domestically produced MFA goods of worker i 's employer in 1999 and estimate equation 1 and equation 2 using $CAffW_{i99}$ as a treatment variable. This way, exposed workers employed in firms domestically producing a quota product that does not constitute a significant revenue share will be given less weight than exposed workers whose workplaces concentrate heavily on domestic MFA good production.

4 Results

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

4.1.1 Average Effects

Table 1 column (a) presents results from estimating equation 1 for earnings, income and employment measures. The estimation sample in column (a) consists of all employees of the textile and clothing sector in 1999 who were born between 1943 and 1982 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 other

T&C workers. The coefficient estimate in Panel A in column (a) indicates an about 5 % decline in annual salary from the primary employment. In Panel B the dependent variable is total labor income, which is defined as the summation of all wages earned from all occupations held within a year. The impact is only a bit less, it is about 4.2 % and significant at the 1 percent. The salary information is typically reported by the employer. As a robustness check, I also used total salaries information which is directly reported by the person to the tax authorities. The DID coefficient estimate obtained using this alternative total salaries measure (panel C of Table 1 column (a)) shows an about 6.6 % disproportionate decline in affected workers' total salaries. The last income measure considered is the personal income that includes labor income as well as income from self-employment, personal business income, pension income, unemployment insurance, government transfers, and other cash benefits excluding wealth/capital income. Unemployed workers receive compensating benefits from their unions and from the government, and the adjustment could also involve working as a self-employed, or going into early retirement. The results for annual personal income shows no significant effect and indicates that these potentially compensating benefits, on average, cover the loss in annual labor earnings that was caused by the MFA trade shock.²¹

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 column (a) of Panel I and J show that workers who are directly exposed to the import shock also experience a significant disproportionate decline in the average number of days worked within a year²² and the reduction in the number of days worked not a voluntary development as evidenced by

²¹While the number of observations vary due to varying number of observations with zero values as well as due to availabilities due to different sources, when income measures are run on a sample where all other income variables are available (N=109701), the respective coefficients of column (a) from Panel A through Panel D are: -0.050^{***} , -0.035^{***} , -0.032^{***} , and -0.012^* .

²²While 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. Conducting the same analysis over the dependent variable measuring the number of days worked for the most important job (in terms of time spent) within a year provides the estimate of α_1 as -0.044^{***} .

Table 1: Impact of MFA Quota Abolishment on Earnings, Income, Employment, and Unemployment

Workers with primary employment in the T&C sector in 1999 sampled by education				
Sample Period: 1999-2010	(a)	(b)	(c)	(d)
	All	College Education	Vocational Education	at most High School Diploma
	$\hat{\alpha}_1$	$\hat{\alpha}_1$	$\hat{\alpha}_1$	$\hat{\alpha}_1$
A Annual Salary (primary employment)	-0.051*** (0.011)	-0.049 (0.030)	-0.028 (0.015)	-0.066*** (0.016)
B Total Salaries	-0.043*** (0.011)	-0.007 (0.031)	-0.035* (0.017)	-0.057** (0.017)
C Total Salaries - personal tax records	-0.068*** (0.016)	0.017 (0.037)	-0.056* (0.023)	-0.111*** (0.025)
D Personal Income incl. unemployment insurance	-0.007 (0.007)	0.019 (0.021)	0.005 (0.010)	-0.020 (0.010)
E Total Annual Hours Worked (primary employment)	-0.044*** (0.007)	-0.039* (0.035)	-0.036*** (0.022)	-0.052*** (0.022)
F Total Annual Hours Worked (all occupations)	-0.081*** (0.014)	-0.058 (0.035)	-0.080*** (0.022)	-0.095*** (0.022)
G Hourly Wage (primary employment)	0.008 (0.004)	0.012 (0.014)	0.004 (0.007)	0.013* (0.006)
H Hourly Wage (avg. across all occupations)	0.010* (0.005)	0.019 (0.015)	0.011 (0.007)	0.006 (0.006)
I No of Days Worked Within a Year	-0.047*** (0.010)	-0.019 (0.028)	-0.064*** (0.016)	-0.046** (0.015)
J Cumulative Unemployment Measure	0.106*** (0.012)	0.019 (0.033)	0.084*** (0.021)	0.150*** (0.017)

Notes: Estimation of equation 1. All regressions include year and person fixed effects. Dependent variables are listed in the table. All dependent variables are in logarithmic form. A constant is included but not reported. The cumulative unemployment index, in Panel J, is defined as the cumulative sum of the percentage of working time spent as unemployed within each year since 1980. Due to differences in data sources and the logarithmic transformation, the number of observations vary. The number of observations from Panel A through Panel J in column (a) are 109839, 119482, 120998, 135374, 106066, 69289, 106066, 69289, 112719 respectively. The number of observations from Panel A through Panel J in column (b) are 13231, 14039, 14099, 15059, 12870, 8474, 12870, 8474, 8472, 12117 respectively. The number of observations from Panel A through Panel J in column (c) are 38875, 41857, 42288, 46970, 37939, 24447, 37939, 24447, 24438, 38041 respectively. The number of observations from Panel A through Panel J in column (d) are 55304, 60891, 61855, 70136, 52914, 34784, 34768, 59699 respectively. Data Source: Statistics Denmark.

the significant increase in the unemployment measure.²³ On average 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.

Columns (b) through (d) in Table 1 present the estimation results for equation 1 among workers with primary occupations in the T&C sector in 1999 separately across workers with different educational backgrounds: among workers with college education, with vocational education and among workers with at most a (non-technical) high school degree. The results reveal that the average 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 labor earnings among workers with at most a high school diploma is negative and significant. For these workers the results show an about 6.4 % decline in primary annual salary. The results on annual hours worked, hourly wages 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. It is important to remember that these magnitudes are relative to other textile workers with the same educational backgrounds, so the impact found here can be regarded as a lower bound of the full 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 effect throughout the 9 year period becomes insignificant. I will return to this below.

With a long time dimension of data, possible serial correlations in the dependent variables may

²³The dependent variable in Panel J of Table 1, the cumulative unemployment index, is defined as the cumulative sum of the percentage of working time spent as unemployed within each year since 1980.

lead to under-estimation of standard errors in a difference-in-difference setting (Bertrand, et al. (2004)). To address this potential problem, the analysis is also conducted with data which is aggregated into two periods: pre-and post-WTO. These results, which are presented in the online appendix (Table 1), agree with the results presented in Table 1.

The analysis is also conducted using the continuous treatment variable, *CAffW*, where workers are assigned weight in the treatment group proportional to the degree of exposure of the firm of their initial employment. Results from this analysis are presented in Table 2 in the online appendix. Utilizing additional cross-sectional variation in the degree of exposure to the shock at the initial firm results in larger magnitudes of coefficient estimates.

4.1.2 Cumulative Effects

For each worker cumulative variables are constructed using workers' annual earnings, employment, and annual hours worked in their primary employment. Table 2 presents estimation results of equation 2 for workers' cumulative earnings, cumulative employment and cumulative hours worked among workers who were born between 1943 and 1982 with their primary occupation within the T&C sector in 1999.²⁴ The cumulative employment variable is simply the number of years employed with positive wage earnings between 2002 and 2010. Any worker who has an employment at the end of November with positive salary is regarded as 'employed' for that year regardless of the length of that employment relationship. The cumulative earnings and cumulative hours variables are normalized by the 1999-2000 average value of the respective measure: annual earnings and the annual hours worked.

Column (a) of Table 2 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 63 % 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 over 2002-2010. Results in Panel C, column (a) show a negative and significant effect of the trade shock on workers' annual hours worked. Workers exposed to the trade shock may be systematically different from other textile workers and these

²⁴Descriptive statistics of these variables are presented in Table A-3.

potential differences may cause divergent patterns in their future labor market performance. After controlling for workers' demographic (age, gender, immigration status) differences the results presented in column (b) of Table 2 for cumulative earnings and cumulative hours are still negative and significant with very similar magnitudes. Additionally controlling for occupational, educational differences, initial wage, their past performance (unemployment history and labor market experience), union membership, UI membership and initial workplace characteristics that may have an affect on workers' accumulation of knowledge and experience, the coefficient estimates for cumulative earnings and cumulative hours regressions are still significant at the 1 percent level with bigger magnitudes and the coefficient estimate of cumulative employment stay insignificant.

Confirming the results obtained with the fixed effects model, these results show that workers that were under direct threat from the MFA removals experienced a significant decline in their earnings compared to other observationally similar workers. The effect on their cumulative earnings amounts to 70 % of a pre-MFA abolishment annual wage (column (d)). The results show no significant effect on the number of post-shock years worked. The results on the hours worked, on the other hand, show a significant effect that amounts to 55 % of pre-MFA abolishment annual hours worked. Measuring employment as the number of years worked with positive earnings may be too crude a measure to capture the potential effect of the trade shock on employment. In line with the fixed effects results presented before, these results imply that the earnings losses were mainly driven by decline in hours worked.

Table 3 in the online appendix presents estimation results of equation 2 for earnings and employment with the alternative treatment variable, *CAffW*. Using the continuous treatment results in larger magnitudes of coefficient estimates and the results are robust. The coefficient estimate for cumulative earnings imply that the differential earnings loss between a worker in the 75th percentile of exposure to competition and a worker in the 25th percentile of exposure is 64 % of an initial salary. Reported coefficient estimates for control variables indicate that male, older, non-immigrant workers, workers with higher-level initial occupation, and workers with a high wage initial workplace have higher cumulative earnings. Workers with higher level of experience and better unemployment history, and college educated workers have

higher cumulative employment.

In order to get a more complete picture of the effect of the MFA shock on workers' cumulative outcomes as well as to confirm the source of the earnings effect, Table 3 presents the estimation of equation 2 including additional workers' outcomes: earnings per year of employment, hours worked per year of employment and hourly rate per year of employment. The results presented on Panels A, B and C of Table 3 are quite similar to the results obtained in Autor, Dorn, Hanson and Song (2014) for American workers. That is, the Chinese import shock causes significant reductions in earnings of workers and the declines in earnings occur mainly within years with employment as opposed to reductions in the number of years employed. Results presented on Panels D, E and F show that per year reductions in earnings are due to reductions in hours worked as opposed to in hourly wages. The effect on earnings per year of employment amounts to close to 12 % of a pre-MFA abolishment annual wage and the effect on hours worked per year of employment amounts to more than 8 % of pre-MFA abolishment annual hours worked. The effect on hourly rate per year of employment shows no significance. 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. These results are in line with the general structure of the Danish labor market where collective bargaining of wages causes downwardly inflexible wages.

These results do not address whether the initial trade shock had any effect on workers' employment. It is possible that workers that were under direct threat of the competition experienced reductions in their hours worked without losing their jobs. But the fixed effects results from Table 1 reveal significant negative effect of the Chinese import shock on workers' time spent as unemployed within a year. So it is more likely that workers fully compensated for the initial employment loss caused by the Chinese import shock. Next the impact of the initial trade shock will be disentangled from the subsequent adjustment of workers to this shock.

4.2 Workers' Adjustment by Moving across Jobs within and between Sectors

Workers are selected as 'affected' because of 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' adjustment, 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, mining, and construction. These results are presented in Table 4. In column (a) estimates of the cumulative effect are presented and in columns (b) through (f) they are decomposed into different channels.²⁵

Results in Panel A of Table 4 show that a substantial negative effect on earnings was experienced at the initial employer amounting to 110 % of an initial annual salary. This loss was partially compensated for over the 9 following years, such that the overall impact is 70 % of an initial annual salary. The results in Panel A show that this partial recovery happened mainly by workers' movement to service sector jobs. Affected workers had 42 % of a pre-MFA abolishment annual wage more earnings in subsequent service sector jobs in comparison to other workers with similar characteristics initially employed in the same industry. Earnings recovery within the T&C sector is found to be quite limited; the coefficient estimate for the earnings obtained in subsequent jobs within the initial sector is small at 4.8 % of an initial annual wage and statistically insignificant. Similarly, coefficient estimates in panel B of Table 4 show that the MFA removal caused a significant loss of employment of workers at their initial (exposed) employers amounting to one year's work. The positive and significant coefficients of columns (c) and (e) in Panel B also show that affected workers offset their employment loss at the initial firm by moving across jobs within T&C, and to a much larger extent by moving to service sector jobs. Despite having higher likelihood of switching to other jobs in the same sector, affected workers

²⁵Due to the nature of the analysis, the number of observations will vary for earnings, hours, and hourly wage per year of employment. For example, earnings/hours/hourly wage per year of employment at jobs in service sector is not defined for workers who never had a primary employment in the service sector throughout 2002-2010. Hence only the decomposition of the cumulative outcome variables across different jobs that workers had during the period will sum to the estimates in column (a).

are not found to significantly recover their initial loss in these T&C jobs.

Coefficient estimates in Panel C show that workers 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. Actually the reduction in per year earnings is only 2 % at the exposed firm, and weakly significant, but it is 11 % at subsequent service sector jobs. That is, manufacturing workers affected by the Chinese import shock are found to move disproportionately to a less well paying situation in the service sector, but this move is also the main source of recovery from their initial employment and earnings loss.

Per year earnings reductions in subsequent service jobs could be because these jobs offer less per hour. It could also be that workers work less hours, maybe because these jobs are mostly part-time or short-term jobs in the service sector. Another possibility is that affected workers have frequent disruptions in these jobs and difficulty in maintaining their employment.

The results presented in Panel D of Table 4 on cumulative hours worked confirm that employment has been shortened significantly at the initial firm. Affected workers experience a decline in hours worked at the initial (exposed) firms amounting to one pre-abolishment year of hours worked. Confirming the finding with the employment measure, affected workers are also found to work relatively more hours in service sector jobs following the trade shock. But comparing the estimates in column (e) between Panel B and Panel D implies that affected workers work less hours per year of employment in the service sector. Results presented in Panel E on hours worked per year of employment confirm this. More specifically, the MFA shock causes an increase in cumulative hours worked in service sector jobs by about 44 % of pre-abolishment annual hours worked. At the same time, affected workers work 10 % less hours per year in these service sector jobs in comparison to observationally similar workers that were initially employed by non-exposed T&C firms. Results on the hourly wage per year of employment (normalized by the initial hourly wage) presented in Panel F show only a weakly significant minor effect of the trade shock at the initial firm and show no significant effect on hourly wages at the subsequent jobs.

These results show that the decline in average earnings observed in the service sector is not

because that affected workers move to less well-paid (per hour) service sector jobs or because affected workers experience subsequent reductions in their hourly rates, but because they work less hours. Affected workers may have difficulty in finding full-time or longer-term service sector occupations or occupations that are suitable to them, and hence they may have a higher likelihood of leaving or losing their employment and so spending time as unemployed within a year. This is also in line with the significant increase in workers' time spent as unemployed due to the import shock from China as presented in the previous section.

Table 4 in the online appendix presents the same analysis with the alternative treatment variable, *CAffW* and the results are similar. The cumulative workers' outcome variables are based on the workers' primary employment.²⁶ An alternative definition of the cumulative earnings can be inclusive of all occupations held by workers within a year. If workers change their employment within a year or hold several part-time jobs in the service sector, then the earnings compensation at the service sector is expected to be higher when one considers all labor earnings. Corresponding results for the cumulative earnings, cumulative employment and earnings per year of employment that are based on all occupations, primary or not, held by a worker within a year are presented in the online appendix (Table 5). Since industry information is not available for all jobs that workers hold, the decomposition exercise in this analysis is still based on workers' primary industry affiliation. The results are similar and show a negative and significant effect of the trade shock on workers' cumulative total earnings, amounting to 48 % of an initial annual total earnings. While the total recovery in the subsequent service jobs is found to be 51 % of an initial annual total earnings, the results also show that even when one considers earnings from additional jobs, the reduction in per year earnings in subsequent service jobs amount to 10 % of initial annual total earnings. These results confirm that workers face adjustment problems even after finding employment in the service sector.

Table 6 in the online appendix presents the analysis for a sub-sample of workers with more than one year continuous full-time tenure in the initial T&C workplace in 1999. These results show that workers with higher tenure and full-time attachment at the initial workplace experienced

²⁶Since IDA provides information on workers' hours worked, job types, occupational position, industry affiliation, etc.. associated with workers' primary employment, in this setting the cumulative earnings from a primary employment in this setting is the most appropriate choice of earnings measure for this analysis.

somewhat bigger reductions in their cumulative earnings in the initial workplace, amounting to close to 130 % of an initial annual salary. But these workers did better at partially compensating afterwards in service sector jobs, as they are found to move to better paying service jobs (Panel F of Table 6 in the online appendix). In the service sector they recover a little over 75 % of a pre-abolishment annual wage. These findings imply that the trade shock had a stronger effect on lower tenured workers and those with lower attachment to their primary employment, not because of a stronger effect of the initial shock, but because of the more painful adjustment process that these workers experienced. The result that the initial negative shock was felt stronger for higher tenure, higher attachment workers is in line with the general structure of the Danish labor market with very liberal rules for firing. It is also in line with the notion that workers with longer term positions are the ones most likely to have accumulated substantial firm-specific human capital (Kletzer (1998)), and should have earned a return on that capital, had they not been exposed to the trade shock.

4.2.1 Dynamics of Workers' Adjustment to Trade Shock

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 ($\hat{\beta}_1$) and the confidence interval from the year by year regressions of cumulative earnings. The negative impact of the MFA shock on earnings in 2002 is found to be significant.²⁷ The negative impact on earnings increases quite rapidly, with a slight inflection point in 2006. The earnings differential between affected workers and other T&C workers with similar characteristics increases by 10 % of an initial wage from 2004 to 2005. After that the rate of increase decreases a bit. Figure 1-(b) shows the coefficient estimates from the decomposition exercise of the cumulative earnings effect.

²⁷The 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. Consequently, the impact measured in 2002 measures the impact for the whole year 2002.

The negative impact at the initial firm increases quite rapidly until 2008.²⁸ The 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 sector of initial employment decreases through time. From 2004 earnings recovery from employment in other T&C jobs becomes negligible and the earnings differential between affected and non-affected workers in other T&C jobs starts declining after 2005. In 2005, the positive cumulative earnings impact at other T&C jobs reaches 10 % of 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 manufacturing jobs outside of the T&C sector are not found to be an important source of earnings compensation.

Figure 2 and Figure 3 show the coefficient estimates ($\hat{\beta}_1$) 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 by the annual hours worked in the initial primary employment. The impact of the Chinese import shock on employment worsens in the first three years; after that it settles down. The impact is found to be significant on the number of years employed until 2008. After that there is no significant effect found on employment.

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 and occupation specific human capital, but as the industry is shrinking they take employment in the growing service sector. Service sector employment emerges as the only driver for the employment recovery after 2004.

Figure 3 shows that the cumulative hours differential between affected workers and others follow a similar pattern. The differential in the cumulative hours worked flattened a bit after 2005, but it still continued to increase afterwards. The decomposition analysis in Figure 3-(b) reveals that affected workers' shorter employment spells or reduced hours in subsequent service jobs

²⁸The additional few quotas that were retained by the EU in 2005 as part of the "Bra War" were dismantled in 2008, starting the quota-free regime with China.

contributed to this.

4.2.2 Part-Time Jobs or Frequent Disruptions in the Service Sector?

An important part of the adjustment costs to the trade shock is identified as a lower number of worked hours in subsequent service sector jobs. This could be either because workers who were under direct exposure to the trade shock disproportionately move to part-time jobs or because they experience difficulty in keeping stable employment in the service sector.²⁹ Utilizing information on job types provided by IDA, I decompose the cumulative earnings, the cumulative employment and the cumulative total labor income recovery obtained in the service sector into full-time service jobs, part-time or side service jobs or jobs with no type information available. The results, presented in Table 5, show that affected workers do not disproportionately take part-time or side jobs in the service sector. Almost all of their earnings as well as employment recovery come from full-time jobs there. These results indicate that affected workers have difficulty in keeping stable employment in the service sector. This finding puts a spotlight on the adjustment frictions faced by workers, as they seek to adapt to a new type of work in the service sector following a trade shock, and highlights the difficulty or slowness in making such a transition even in an environment with a relatively low unemployment rate and full-time jobs available.³⁰

²⁹Using the US Displaced Workers Survey, Farber (2005) documents that during 2001-2003, 13 % of workers displaced from full-time jobs were reemployed in part-time jobs.

³⁰Throughout the 2006-2008 period the unemployment rate in Denmark was under 4 %. In 2008 it was 3.5 % and increased to 6.1 % in 2009 (OECD Employment Database 2013).

Table 5: Service Sector–Part-Time Jobs or Disruptions?

	(a)	(b)	(c)	(d)
	All Service Jobs	Full-time Service Jobs	Part-Time Service Jobs	Unknown
Cumulative Earnings				
	0.425*	0.455**	-0.031	0.001
	(0.167)	(0.160)	(0.027)	(0.001)
Cumulative Employment				
	0.707***	0.681***	0.023	0.003*
	(0.059)	(0.056)	(0.016)	(0.001)
Cumulative Total Labor Earnings				
	0.515***	0.521***	-0.024	0.009
	(0.130)	(0.123)	(0.027)	(0.006)

Notes: The number of observations are 10521 in all columns and panels. All regressions include a constant and the full set of controls, $Z_{i,99}^W$ and $Z_{i,99}^F$. Data Source: Statistics Denmark.

4.3 Heterogeneity in Workers' Adjustment to Trade Shock

4.3.1 Education

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 effect across the 9 year period. It is possible that while college educated workers are in fact hit by the trade shock, they have fully recovered through subsequent adjustment by the end of the period.

To investigate potentially divergent patterns of adjustment to the shock by workers with different skill levels, workers are sampled according to their highest attained education and the cumulative measures are decomposed into a set of mutually exclusive channels of adjustment separately for college educated workers, for workers with vocational education and for workers with at most a (non-technical) high school degree. The results are presented in Table 6 and in Table 7. These results show that college educated workers were at least as heavily hit at the initial employer

as workers with lower levels of education. Column (b) of Panel A in Table 6 shows that college educated workers would have earned an additional 110 % of an initial annual wage at their initial firms if they were not exposed to the shock. The impact of the import shock was felt to a similar degree at the initial firm among workers with vocational education and among workers with at most a high school diploma, amounting 120 % and 100 % of a pre-MFA abolishment annual wage. Results presented in column (b) of Panel B in Table 6 on cumulative employment as well as in column (b) of Panel A in Table 7 on cumulative hours worked reveal that for all workers regardless of their education, the main source of the negative wage effect of the MFA shock at the initial firm was shortened tenure there.

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. All affected workers regardless of their education are found to have higher likelihood of switching to service sector jobs (column (e) of Panel B in Table 6), but the results show that 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 (column (e) of Panel A in Table 6). College educated workers, on the other hand, are able to fully compensate for the initial earnings losses in subsequent service sector jobs (comparing coefficients in columns (b) and (e) at the first row of Panel A). 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 6 show that the import shock causes significant decline in earnings per year of employment among workers with vocational education (8 % of an initial annual wage) and among workers with at most a high school degree (17 % of an initial annual wage). These reductions are due to reductions in per year earnings at their subsequent employment. Results presented in Panel B and C in Table 7 on hours worked and hourly rate per year of employment show that non-college educated workers' failure in recovering from their initial earnings loss at the subsequent service jobs are related to lower hours worked there.

Using aggregate data Autor, Dorn, and Hanson (forthcoming) show that the effect of Chinese imports on local labor markets tends to be stronger for non-college educated employment. Utar (2014) also finds the negative effect of the import shock to be concentrated on non-college

educated employees at the firm-level. The findings presented in this paper show that results at the region, industry and firm-level can (mis)lead to the conclusion that college educated workers are immune from the negative employment effect of trade shocks. The findings here suggest that successful adjustment to the shock is an important determinant of the different aggregate outcome of employment between college and non-college educated workers.

Results on cumulative employment in Panel B of Table 6 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. These results indicate that affected unskilled workers (workers with at most a high school diploma) not only have difficulty in getting or keeping 'good' jobs in the service sector, but their future employment opportunities within their initial industry are also worse relative to affected workers with college and vocational education. These results are in line with Utar (2014) 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 concentrated on non-production activities. The restructuring was also found to be associated with a modest increase in hourly wages at the firm-level to college educated workers. Affected workers who were able to switch to jobs in such restructured firms, were probably better able to utilize their already accumulated industry-occupation specific knowledge.³¹ Results on hourly rates in Panel C of Table 7 show that affected workers with college education receive slightly higher hourly wages on average in these T&C jobs. Part of the move to other T&C jobs could be voluntary or self-initiated for college educated workers. However, all together results also indicate that restructuring within T&C firms was too limited to provide increased demand for college educated workers, and that the service sector arose as the main absorber for these workers.

Panel A of Table 7 shows that the MFA shock causes an increase in the cumulative hours worked in the service sector of about one year's initial annual hours worked for college educated workers, and of about 35 % and 39 % of initial annual hours worked for workers with vocational and at most high school education respectively. For the latter two groups of workers, however, the shock causes a significant decline in the hours worked per year of employment in these service

³¹These results are also in line with Hummels, Jørgensen, Munch and Xiang (2014) that shows that offshoring is associated with an increased wage premium for high-skilled workers in Denmark.

jobs amounting to 9 % and 10 % of initial annual hours worked respectively as shown in Panel B of Table 7.

The results suggest that affected workers with lower level of education face worse future employment opportunities within their initial industry 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 and keeping 'good' jobs in the service sector compared to their college educated colleagues. The results suggest that affected workers with lower education are not as well matched with these jobs, or for other reasons they have a higher likelihood of leaving or losing the jobs.³²

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.

4.3.2 Occupation

Table 8 and Table 9 present the decomposition analysis separately for workers with different occupations at their initial employers.³³ Results presented in Panel A of Table 8 show that over the 2002-2010 period workers with elementary occupations who were exposed to the shock experienced a significant decline in their cumulative earnings that amounts to two annual salaries (in initial salary) relative to other observationally similar T&C workers with elementary occupations. Affected operators and assemblers experienced a significant decline in their cumulative earnings relative to other T&C operators and assemblers that amounts to about one annual salary. The impact of the import shock on the cumulative earnings of managers, professionals

³²Corresponding results on cumulative earnings, cumulative employment, and earnings per year of employment that are based on all occupations held by a worker within a year are presented in the online appendix (Table 7), and the results are similar.

³³Occupation classifications follow International Standard Occupational Classification (ISCO-88) major groupings. Details are provided in the online appendix.

and technicians, clerks and other service workers as well as craft 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.

Comparing the overall effect of the import shock on cumulative earnings with the impact at the initial firm (columns (a) and (b) of Panel A in Table 8) it is revealed that the divergent adjustment paths of workers with different occupations are an important driver of the heterogeneity in the impact of the Chinese import shock. The initial impact of the shock ranges between 77 % to 146 % of an initial annual wage across all occupations. The effects of the shock experienced by managers, clerks and service workers as well as operators and assemblers at their initial exposed workplaces were, for example, all almost the same, around 115 % of a pre-abolishment annual wage.

Managers include corporate managers, executives, production and operations department managers and general managers. Clerks and service workers include secretaries, office clerks and security service personnel. Operators and assemblers include weaving and knitting operators, other machine operators and assemblers. If a significant part of the human capital accumulated through work experience is specific to a firm or an industry, then workers displaced from their jobs are likely to experience larger losses. Panel B of Table 9 shows that exposed operators had a higher likelihood of moving on to other manufacturing jobs as well as to service sector jobs. The increase in their cumulative employment in other manufacturing jobs and in service jobs amounts to 34 % and 54 % of a year respectively and they are statistically significant. 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 knowledge 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. 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 almost no effect on the cumulative earnings. Workers with elementary occupations (manufacturing labourers) fare even worse and experience an additional decline in earnings in

subsequent manufacturing or service jobs, of close to 70 % of an initial annual wage, although not statistically significant. These results are in line with Kambourov and Manovskii (2009) and highlight the importance of occupational tenure in trade-induced adjustment costs.

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 workers with elementary occupations, both overall and especially at subsequent service sector jobs. Results on the cumulative hours worked presented in Table 9 also suggest that the main margin for the decline in earnings per year is the decline in the number of hours worked.

Results presented in Table 8 and Table 9 show that handcraft workers were the least negatively affected group at their exposed workplaces compared to other occupations. 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 (2014) documented restructuring in line with this idea in the Danish textile and clothing industry in response to the intensified competition from China. 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 and assemblers. Yet their abilities to recover subsequently were very good as workers of this group are observed to compensate for their initial loss similarly well in other T&C jobs, other manufacturing firms or in the service sector (Panel A of Table 8 in columns (c)-(e)). This is most probably because the occupation specific human capital of this group requires the least industry and employer specific knowledge, for example compared to being a machine operator in the T&C sector or being a production department manager, hence they are more likely to

retain their occupational skills across industries.

The import shock is found to trigger movement to service jobs among workers across all occupations (column (e) of Panel B in Table 8 and of Panel A in Table 9). Results on cumulative employment and cumulative hours worked presented in column (e) imply that managers and craft workers were relatively better at keeping full-time employment there compared to, for example, machine operators or workers with elementary occupations.³⁴ Note also that we are focusing on differences across occupations controlling for other worker characteristics such as education levels.

Autor, Dorn, Hanson and Song (2014) show that low-wage workers tend to stay within manufacturing where they were repeatedly exposed to the import shock and identify being able to move out of manufacturing jobs as an important factor in determining the success of American workers' adjustment to the Chinese import shock. The results presented here show that in addition to being able to move to the service sector, workers' occupation specific skill-match in subsequent service jobs is a very important determinant of success and speed of recovery from the trade shock. The results suggest that policies that could lower the adjustment costs for workers associated with switching sectors, such as ALMP, may not be enough to provide smooth adjustments for all workers.

These findings also highlight that both firm and industry specific components of occupational human capital are important aspects of trade adjustment³⁵, but the extent to which these two components play a role in workers' adjustment costs depends on the type of occupation.

³⁴The results presented in Table 5 shows that in general workers move to full-time service sector jobs. To investigate whether a particular group of worker has a higher likelihood of moving to part-time jobs, the analysis presented in Table 5 is also conducted separately depending on workers' characteristics. These results are presented in the online appendix (Tables 11 through 13) and show that regardless of workers' education or initial occupation, jobs, that they move to in the service sector, are predominantly full-time.

³⁵See Topel (1991) that emphasizes the importance of firm-specific human capital and Neal (1995) that finds industry-specific knowledge to be an important part of human capital.

4.3.3 Age

Tables 10-11 present the analysis of workers' adjustment to the low-wage import shock separately for workers with different age groups. 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 between 50 and 56 years old.³⁶

Results in Panel A of Table 10 show that the Chinese import causes cumulative earnings of late-career (50+) workers to decrease significantly by about one pre-MFA abolishment annual salary. For mid-career workers (36-49) the impact is around 60 % of a pre-MFA abolishment annual salary and the impact on the cumulative earnings of the younger cohort (22-35) is not found to be statistically significant. 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 10 show that the impact on the cumulative earnings at the MFA shock exposed workplace was strongest for mid career workers (1.4 initial annual salary), compared to early and late career workers (1 initial annual salary). As mentioned in the previous section, Denmark is among the most liberal countries in terms of firing regulations as firms are not burdened by monetary compensation or advance notifications in case of lay-offs regardless of the tenure of the employees.³⁷ 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 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 10). For mid career workers the number of years spent in other jobs in the same sector

³⁶The age group 'youth' who were between 17 and 22 years old in 1999 are not included in this analysis as the number of observations were too low to make a meaningful decomposition analysis.

³⁷In 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.

as well as in other manufacturing jobs increases significantly as well by about 1/4 and 1/5 of a year respectively. Early career workers have relatively better earning potentials in service sector jobs, and are able to compensate for 74 % (0.704/0.946) of their initial earning loss in subsequent service sector jobs while mid- and late career workers can only compensate for 26 % and 13 % of their initial losses respectively in service sector jobs, although none is statistically significant. 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 11. The results in Panel B show that mid- and late career workers experience significant reductions in their cumulative hours worked and hours worked per year of employment. The significant reductions in hours worked are due to a combination of shortened tenure at the initial firms and also reductions in hours worked throughout the adjustment process. The reductions in hours worked per year of employment, on the other hand, are driven solely by reductions in hours worked per year of subsequent service employment. These results indicate that mid- and late career T&C workers had a harder time keeping stable employment in the service sector. The results on hourly wage per year of employment also show a weakly significant negative effect on hourly wages of older cohorts in their initial firms, suggesting that older cohorts may be more willing to accept pay reductions if this would delay their lay-off.

Additional analysis of workers' heterogeneity in adjusting to the trade shock depending on characteristics of the initial employer are presented and discussed in the online appendix.

5 Self-Employment, Early Retirement and Government Transfers

5.1 Moving Outside of Labor Market?

So far the analysis does not address 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 60.³⁸ 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: being employed at the initial employer, other manufacturing jobs (including other T&C jobs), non-manufacturing jobs (mainly in the service sector), as self-employed, being unemployed, or being outside of the labor market.³⁹ These labor market positions are positions of workers at November of each year as recorded by Statistics Denmark. Results of this analysis are presented in Table 12. Results on the 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, by about a year, and their likelihood of switching to other manufacturing jobs increases and to service sector jobs even more so. While 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 12 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 if s/he is unemployed in November and receives unemployment benefit from the UI, but is still actively looking for a job.^{40 41} Unemployment benefit is typically administered by the respective

³⁸In 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.

³⁹Treated as a separate category, in this partition the specific industry affiliation (manufacturing or non-manufacturing) of the self-employed is not considered.

⁴⁰Receiving unemployment benefit from the UI is conditional on being actively looking for a job. This requires registering with the recognized employment office, maintaining a current CV in a publicly available online database, actively applying for jobs, being ready to take an employment with one day's notice and participating in active labor market activities.

⁴¹The unemployment status in Table 12 is more strict in comparison to the unemployment measure used in the fixed effects model as a worker who was unemployed within a year is not counted as having unemployed status as long as s/he was employed in the last week of November in a given year, or if s/he was unemployed for a prolonged time or uninsured.

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 insurance through his/her union anymore.⁴² Finally, results presented in Panel F of Table 12 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 regarding American workers' experience by Autor, Dorn, Hanson and Song (2014). The active labor market policies used in Denmark together with generous unemployment insurance may be one reason behind this difference in outcome.

Table 12: MFA Quota Abolishment and Labor Market Positions over 2002-2010

Number of years		AffW ($\widehat{\beta}_1$)
A.	at Initial Employer	-1.006*** (0.059)
B.	at Other Manufacturing Jobs	0.196*** (0.056)
C.	at Non-Manufacturing Jobs	0.708*** (0.060)
D.	as Self-Employed	-0.011 (0.016)
E.	as Unemployed	0.068*** (0.017)
F.	Outside of the Labor Market	0.054 (0.039)

Notes: The number of observations in all panels are 10521. All regressions include a constant and the full set of controls, $Z_{i,99}^W$ and $Z_{i,99}^F$. Data Source: Statistics Denmark.

5.2 Recovery via Transfers?

Results presented in section 4.3 show that the import shock caused by removal of MFA quotas increases workers' likelihood of having primary employment in the service sector. However the results also show that on average workers were not found to significantly recover from their initial

⁴²After four years of unemployment, unemployed people are covered by social assistance benefits specifically for unemployed people which are publicly funded and not as generous.

earning losses at the service sector despite having higher likelihood of moving to service sector jobs in comparison to other observationally similar T&C workers. The results presented so far showed that on average workers have lower working hours in the service sector. Together with the results on part-time jobs and unemployment, these results suggest that workers experience frequent disruptions in the subsequent service sector jobs.

ALMP in Denmark may have played a role in allowing workers to move from the shrinking T&C sector to the growing service sector relatively quickly. However, while ALMP can help workers find and take jobs relatively quickly, they may not be effective in making workers maintain stable employment especially in the presence of generous unemployment insurance. If workers move to service sector jobs as part of ALMP they will continue to receive unemployment benefit whenever these jobs are terminated involuntarily. If so, for these workers, their initial earnings losses may also be recovered via 'benefits and transfers' while their primary attachment to the labor market continues to be in the service sector.

To analyze this a cumulative personal income measure is constructed for each worker (measured in initial annual personal income). In addition to labor earnings and self-employment income, the personal income measure includes unemployment benefit, pension income and welfare transfers. The overall effect of the import shock on personal income is estimated using equation 2 and it is decomposed over the mutually exclusive labor market positions of workers. Table 13 presents these results. Similar to the results on wages, affected workers' initial loss at the initial employer amounts to close to 110 % of a pre-MFA abolishment annual income. Unlike the results on wages, personal income results reveal that workers significantly compensate for their initial earnings losses while their primary attachment to the labor market is in the service sector. Comparing the estimate in Panel C of Table 12 with the estimate in Panel D of Table 13 shows that recovery in income happens to the same extent as recovery in employment in the service sector.

The results presented in section 4.3 show that challenges in earnings recovery in the service sector are concentrated among workers with no college education, mid-age or older workers or workers with industry specific initial occupation or elementary-level initial occupation. Table 14 presents the analysis on personal income separately for workers with different education levels. These results show that recovery in personal income in the non-manufacturing (service) jobs

amounts to 68 % of a pre-MFA annual personal income for workers with vocational education, which is higher than their employment compensation (60 % of a year). Exposed workers with at most a high school degree also recover significantly from their initial loss in non-manufacturing jobs amounting to 58 % of a pre-MFA abolishment annual personal income. If workers switch to the service sector but can not maintain continuous, stable employment there, they will continue to receive unemployment insurance during the time they are unemployed within a year. These results suggest that the recovery of skilled workers with vocational training and unskilled workers' recovery in service sector jobs are not through earnings but through transfers and benefits. These results also show that despite that the import shock is not found to cause workers to move to outside of the labor market on average, among workers with vocational education it does.

The analysis is also done separately for workers with different age groups and with different initial occupations. These results, which are presented in the online appendix (Tables 14-16), show that unemployment is concentrated among managers, operators and assemblers, but for example not among clerks, craft workers or among professionals. These results highlight once again the nature of the adjustment frictions that workers face, and show that workers' initial occupations are a significant factor in determining their success of recovery. These results also show that the groups of workers who had insignificant earnings recovery in subsequent service jobs, do recover their initial earnings' loss fairly well over 9 years once transfers and benefits are taken into account.

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 import shock 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. The 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. The impact on earnings amounts to 70 % of an initial annual earnings over 9 years. These results suggest that trade with low-wage countries could be an important factor in shaping the income distribution in advanced countries.

A number of interesting features of workers' adjustment to trade shocks are documented which shed light into the nature adjustment frictions. 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, 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' initial occupation, age, and education.

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. 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.

Shorter employment spells at the initial firm and unstable subsequent employment disrupted with frequent unemployment 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 or inability to move to growing sectors. The quota removal causes a higher likelihood of unemployment, but does not appear to drive self-employment or drive workers out of the

labor market altogether. The ALMP combined with a relatively well functioning unemployment insurance system may be one reason behind mobile Danish workers, who do not easily leave the labor market. These results allow an informed discussion of whether institutional differences play an important role in shaping the adjustment mechanism. By showing substantial adjustment frictions that workers experience even after moving to full-time service sector jobs, the results also suggest that effective ALMPs may ensure faster movement towards growing sectors, but this itself does not provide for a smooth adjustment experience, as workers still face challenges in adapting to the new environment.

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Table 2: Cumulative Impact of MFA Quota Abolishment over 2002-2010

Workers with primary employment in the T&C sector in 1999				
	(a)	(b)	(c)	(d)
A. Cumulative Earnings 2002-2010 (in multiples of initial annual wage)				
AffW ($\hat{\beta}_1$)	-0.628*** (0.186)	-0.629*** (0.181)	-0.656*** (0.179)	-0.700*** (0.180)
Demographic Controls	no	yes	yes	yes
Occupation Types	no	no	yes	yes
Education Levels	no	no	yes	yes
Labor Market History	no	no	yes	yes
Initial Hourly Wage	no	no	yes	yes
Union Membership	no	no	yes	yes
UI Membership	no	no	yes	yes
Initial Workplace Controls	no	no	no	yes
B. Cumulative Employment 2002-2010				
AffW ($\hat{\beta}_1$)	-0.023 (0.051)	0.056 (0.049)	-0.091 (0.048)	-0.082 (0.048)
Demographic Controls	no	yes	yes	yes
Occupation Types	no	no	yes	yes
Education Levels	no	no	yes	yes
Labor Market History	no	no	yes	yes
Union Membership	no	no	yes	yes
UI Membership	no	no	yes	yes
Initial Hourly Wage	no	no	yes	yes
Initial Workplace Controls	no	no	no	yes
C. Cumulative Hours Worked 2002-2010 (in multiples of initial annual hours worked)				
AffW ($\hat{\beta}_1$)	-0.495*** (0.116)	-0.495*** (0.116)	-0.519*** (0.114)	-0.553*** (0.115)
Demographic Controls	no	yes	yes	yes
Occupation Types	no	no	yes	yes
Education Levels	no	no	yes	yes
Labor Market History	no	no	yes	yes
Initial Hourly Wage	no	no	yes	yes
Union Membership	no	no	yes	yes
UI Membership	no	no	yes	yes
Initial Workplace Controls	no	no	no	yes

Notes: In all columns across Panel A, B, and C the number of observations are 10521. A constant is included but not reported. Demographic controls are age, gender dummy, and immigration status dummy. 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 education or college and above degree in 1999. Labor Market History variables are unemployment history and experience variables. The unemployment history of the worker is the cumulative sum of the percentage of working time spent as unemployed within each year between 1980-1999. Experience is the number of years person was in the labor market between 1980-1999. 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. Union membership is a dummy variable indicating if the individual is a member of a labor union. UI membership is a dummy variable indicating if the individual is a member of the (voluntary) Unemployment Insurance Fund. 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 since the previous year). Data Source: Statistics Denmark.

Table 3: Cumulative Impact of MFA Quota Abolishment on Workers' Earnings, Income and Employment over 2002-2010

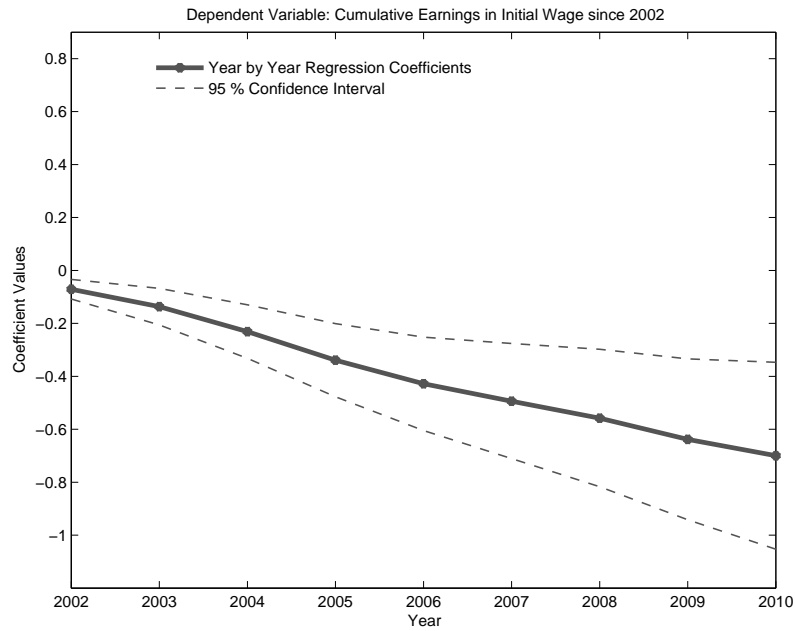
Panel A.	
Cumulative Earnings 2002-2010 (in initial annual wage)	-0.700*** (0.180)
Panel B.	
Cumulative Employment 2002-2010	-0.082 (0.048)
Panel C.	
Earnings per year of employment 2002-2010 (in initial annual wage)	-0.116*** (0.024)
Panel D.	
Cumulative Hours Worked 2002-2010 (in initial annual hours worked)	-0.553*** (0.115)
Panel E.	
Hours Worked per year of Employment 2002-2010 (in initial annual hours worked)	-0.084*** (0.015)
Panel F.	
Hourly Rate per year of Employment 2002-2010 (in initial hourly rate)	-0.007 (0.007)

Notes: The number of observations in Panels A through G are 10521, 10521, 10101, 10521, 10042, 10042, and 10520 respectively. A constant is included but not reported. All regressions include the full set of controls. The full set of controls are demographic controls (age, gender, immigration status), occupation types, education levels, experience, unemployment history, initial hourly wage, union membership, UI membership, and the initial workplace controls as described in tablenotes of Table 2. Data Source: Statistics Denmark.

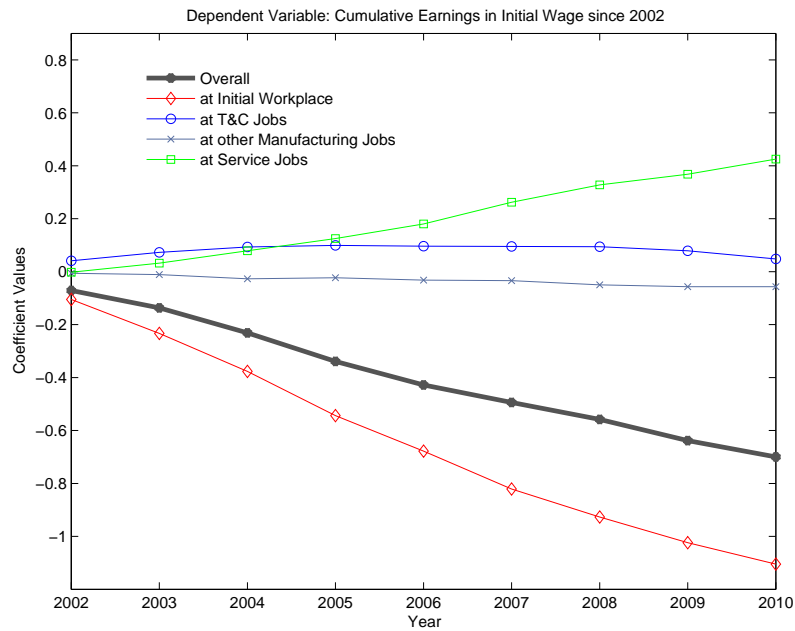
Table 4: Workers' Recovery across Jobs within and between Sectors

	(a)	(b)	(c)	(d)	(e)	(f)
All		Initial Firm	other T&C	other Manuf	Service	Other
A. Cumulative Earnings 2002-2010 (in initial annual wage)						
AffW ($\hat{\beta}_1$)	-0.700*** (0.180)	-1.105*** (0.070)	0.048 (0.063)	-0.057 (0.094)	0.425* (0.167)	-0.011 (0.044)
B. Cumulative Employment 2002-2010						
AffW ($\hat{\beta}_1$)	-0.082 (0.048)	-1.006*** (0.059)	0.123** (0.041)	0.087 (0.044)	0.707*** (0.059)	0.008 (0.020)
C. Earnings per year of Employment 2002-2010 (in initial annual wage)						
AffW ($\hat{\beta}_1$)	-0.116*** (0.024)	-0.020* (0.009)	-0.050 (0.033)	-0.087 (0.066)	-0.109** (0.038)	0.021 (0.091)
D. Cumulative Hours Worked 2002-2010 (in initial annual hours worked)						
AffW ($\hat{\beta}_1$)	-0.553*** (0.115)	-1.046*** (0.063)	0.087 (0.051)	-0.018 (0.070)	0.440*** (0.106)	-0.015 (0.030)
E. Hours Worked per year of Employment 2002-2010 (in initial annual hours)						
AffW ($\hat{\beta}_1$)	-0.084*** (0.015)	-0.011 (0.006)	-0.039 (0.021)	-0.068 (0.038)	-0.096*** (0.024)	-0.037 (0.064)
F. Hourly Rate per year of Employment 2002-2010 (in initial hourly rate)						
AffW ($\hat{\beta}_1$)	-0.007 (0.007)	-0.013* (0.006)	0.014 (0.011)	-0.012 (0.015)	0.012 (0.011)	0.021 (0.025)

Notes: In Panels A, B and D, the number of observations are 10521. In Panels C, E, and F the number of observations are decreasing from 10101, 10042, and 10042 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, experience, unemployment history, initial hourly wage, union membership, UI membership, and the initial workplace controls as described in tablenotes of Table 2. Data Source: Statistics Denmark.



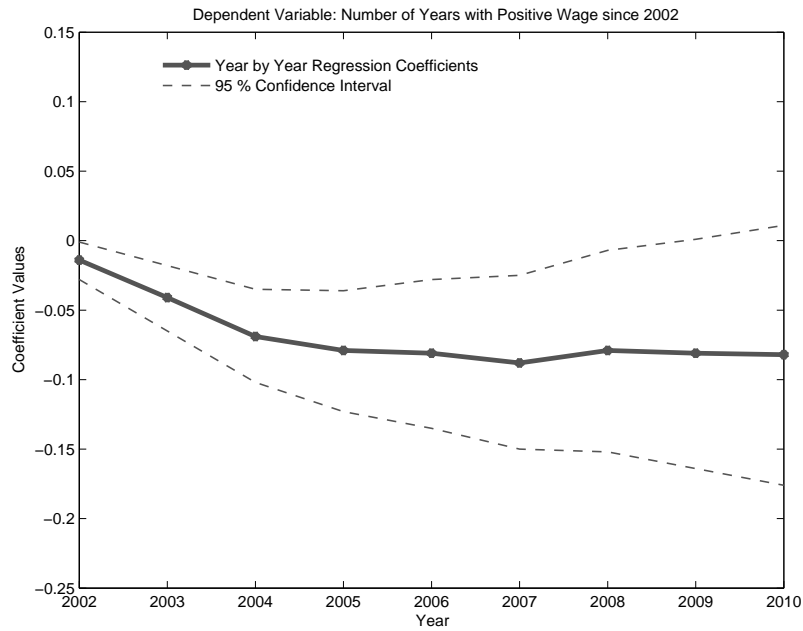
(a) Overall Impact



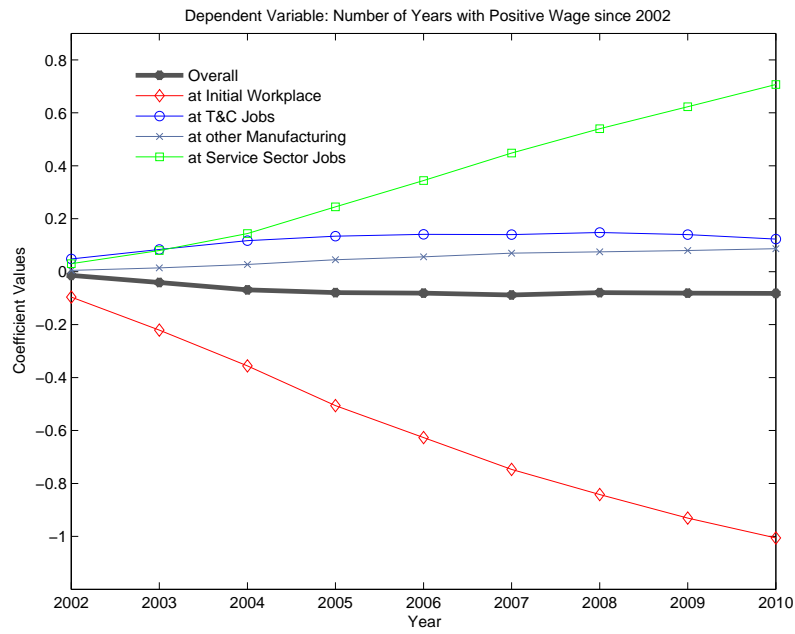
(b) Sectoral Decomposition

Figure 1: Year by Year Impact on the Cumulative Earnings

All regressions include a constant and the full set of controls, $Z_{i,99}^W$ and $Z_{i,99}^F$.

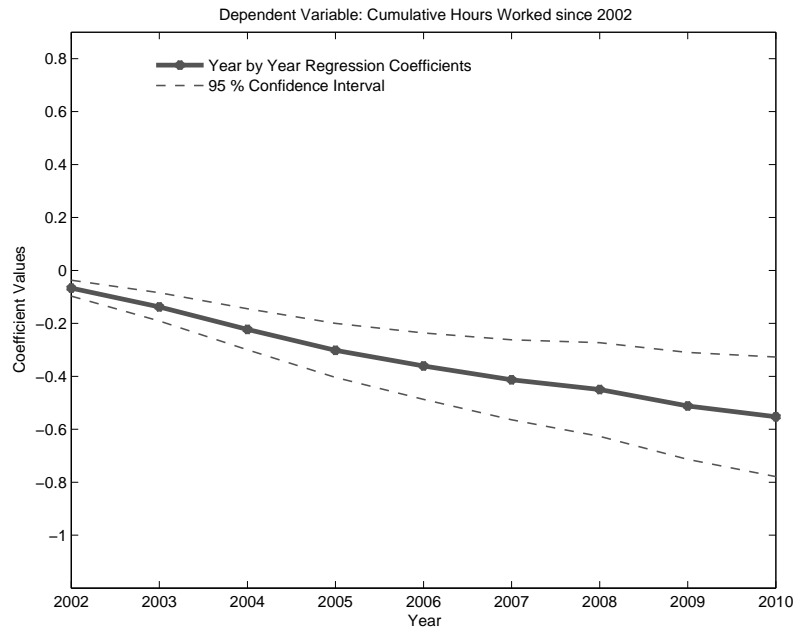


(a) Overall Impact

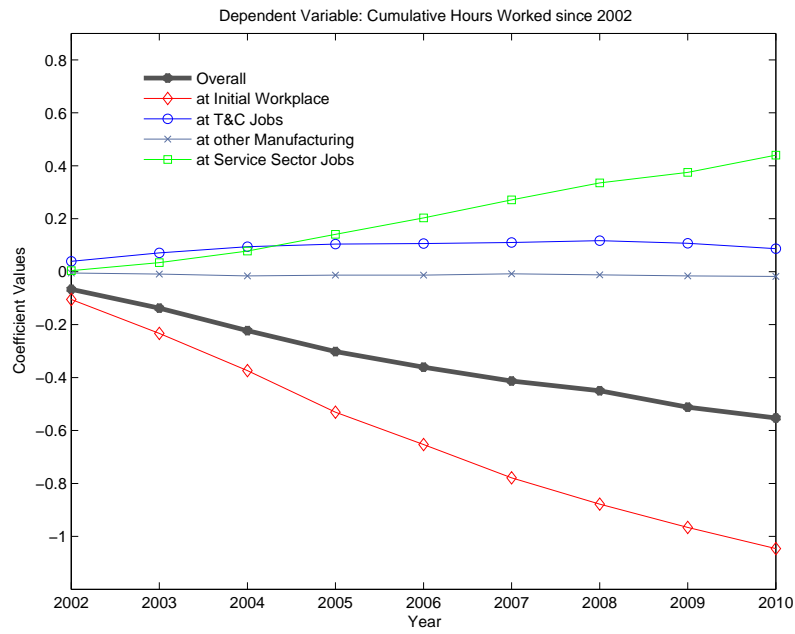


(b) Sectoral Decomposition

Figure 2: Year by Year Impact on the Cumulative Employment
 All regressions include a constant and the full set of controls, $Z_{i,99}^W$ and $Z_{i,99}^F$.



(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, $Z_{i,99}^W$ and $Z_{i,99}^F$.

Table 6: Workers' Adjustment by Education I, 2002-2010

(a)	(b)	(c)	(d)	(e)	(f)	
All	Initial Firm	other T&C	other Manuf	Service	Other	
A. Cumulative Earnings 2002-2010 (in initial annual wage)						
College	0.379 (0.523)	-1.106*** (0.234)	0.189 (0.263)	-0.291 (0.265)	1.522** (0.469)	0.064 (0.052)
Vocational	-0.655** (0.243)	-1.165*** (0.117)	0.121 (0.103)	0.051 (0.121)	0.364 (0.218)	-0.027 (0.085)
High School	-1.033*** (0.300)	-1.022*** (0.094)	-0.048 (0.087)	-0.114 (0.164)	0.166 (0.279)	-0.015 (0.062)
B. Cumulative Employment 2002-2010						
College	0.222 (0.124)	-0.946*** (0.188)	0.363** (0.127)	-0.364* (0.141)	1.111*** (0.178)	0.058 (0.049)
Vocational	-0.207** (0.078)	-1.080*** (0.102)	0.213** (0.070)	0.074 (0.073)	0.604*** (0.100)	-0.017 (0.036)
High School	-0.058 (0.070)	-0.938*** (0.080)	0.010 (0.057)	0.182** (0.063)	0.665*** (0.082)	0.022 (0.028)
C. Earnings per year of Employment 2002-2010 (in initial annual wage)						
College	-0.007 (0.061)	-0.021 (0.031)	-0.080 (0.113)	0.077 (0.144)	-0.031 (0.093)	-0.138 (0.200)
Vocational	-0.080** (0.030)	-0.009 (0.012)	-0.068 (0.060)	-0.024 (0.069)	-0.099* (0.050)	0.074 (0.181)
High School	-0.174*** (0.042)	-0.028 (0.015)	-0.037 (0.044)	-0.170 (0.112)	-0.148* (0.065)	-0.029 (0.116)

Notes: In Panels A and B, the number of observations are 1200, 3680 and 5392 respectively for college, vocational and high school rows. In Panel C, the number of observations are decreasing from 1173 (college), 3565 (vocational) and 5135 (high school) respectively. All regressions include a constant and the full set of controls, $Z_{i,99}^W$ and $Z_{i,99}^F$ except the controls for education levels as the regressions are ran within education levels samples. Data Source: Statistics Denmark.

Table 7: Workers' Adjustment by Education II, 2002-2010

(a)	(b)	(c)	(d)	(e)	(f)
All	Initial Firm	other T&C	other Manuf	Service	Other
A. Cumulative Hours Worked 2002-2010 (in initial annual hours worked)					
College	-1.005*** (0.359)	0.306 (0.201)	-0.265 (0.209)	0.993** (0.324)	0.062 (0.049)
Vocational	-1.127*** (0.177)	0.149 (0.087)	0.064 (0.098)	0.351* (0.168)	-0.047 (0.063)
High School	-0.961*** (0.171)	-0.004 (0.068)	-0.030 (0.111)	0.391* (0.154)	-0.006 (0.038)
B. Hours Worked per year of Employment 2002-2010 (in initial annual hours)					
College	-0.023 (0.043)	-0.089 (0.087)	0.062 (0.116)	-0.060 (0.067)	0.068 (0.160)
Vocational	-0.071** (0.023)	-0.075* (0.034)	-0.017 (0.048)	-0.094* (0.038)	-0.017 (0.122)
High School	-0.099*** (0.023)	-0.012 (0.029)	-0.112 (0.060)	-0.098** (0.036)	-0.085 (0.081)
C. Hourly Rate per year of Employment 2002-2010 (in initial hourly rate)					
College	0.020 (0.017)	0.033 (0.020)	-0.033 (0.044)	0.036 (0.026)	0.034 (0.088)
Vocational	-0.002 (0.008)	-0.008 (0.017)	-0.010 (0.018)	0.014 (0.014)	0.013 (0.035)
High School	-0.025* (0.012)	-0.027** (0.008)	-0.039 (0.028)	-0.008 (0.018)	0.014 (0.039)

Notes: In Panel A the number of observations are 1200, 3680 and 5392 respectively for college, vocational and high school rows. In Panels B and C the number of observations are decreasing from 1169(college), 3552 (vocational), and 5095 (high school), respectively. All regressions include a constant and the full set of controls, $Z_{i,99}^W$ and $Z_{i,99}^F$ except the controls for education levels as the regressions are ran within education levels samples. Data Source: Statistics Denmark.

Table 8: Workers' Adjustment by Occupation I, 2002-2010

(a)	(b)	(c)	(d)	(e)	(f)	
All	Initial Firm	other T&C	other Manuf	Service	Other	
A. Cumulative Earnings 2002-2010 (in initial annual wage)						
Managers	-0.447 (0.428)	-1.139*** (0.329)	0.112 (0.260)	-0.344 (0.285)	0.848* (0.339)	0.076 (0.073)
Professionals and Techs	-0.417 (0.422)	-0.919*** (0.214)	0.399* (0.188)	-0.578** (0.200)	0.621 (0.410)	0.061 (0.053)
Clerks and Service Workers	0.171 (0.613)	-1.149*** (0.220)	0.372* (0.146)	0.315 (0.211)	0.680 (0.619)	-0.047 (0.129)
Craft Workers	-0.282 (0.363)	-0.765** (0.270)	-0.131 (0.175)	0.058 (0.260)	0.618* (0.279)	-0.062 (0.110)
Operators and Assemblers	-1.056*** (0.221)	-1.159*** (0.100)	-0.155 (0.091)	0.228 (0.131)	0.016 (0.196)	0.013 (0.060)
Elementary Occupations	-2.034* (0.813)	-1.459*** (0.278)	0.478* (0.225)	-0.386 (0.392)	-0.693 (0.773)	0.025 (0.259)
B. Cumulative Employment 2002-2010						
Managers	-0.428 (0.226)	-1.114*** (0.295)	0.006 (0.203)	-0.164 (0.171)	0.809** (0.245)	0.035 (0.075)
Professionals and Techs	0.064 (0.116)	-0.836*** (0.175)	0.448*** (0.116)	-0.452*** (0.115)	0.848*** (0.171)	0.056 (0.038)
Clerks and Service Workers	0.174 (0.108)	-0.864*** (0.173)	0.298** (0.101)	0.171 (0.106)	0.567** (0.174)	0.002 (0.049)

Notes: The number of observations are 538 (managers), 1474 (professionals and technicians), 1366 (clerks and other service workers), 894 (craftsmen), 4553 (machine operators and assemblers), and 906 (elementary occupations) rows. All regressions include a constant and the full set of controls, $Z_{i,99}^W$ and $Z_{i,99}^F$ except the control for occupation categories as the regressions are run within occupation samples. Data Source: Statistics Denmark.

Table 9: Workers' Adjustment by Occupation II, 2002-2010

(a)	(b)	(c)	(d)	(e)	(f)	
All	Initial Firm	other T&C	other Manuf	Service	Other	
A. Cumulative Employment 2002-2010						
Craft Workers	0.096 (0.172)	-0.816*** (0.230)	0.051 (0.140)	0.217 (0.177)	0.667*** (0.180)	-0.023 (0.084)
Operators and Assemblers	-0.194* (0.079)	-1.087*** (0.088)	-0.038 (0.064)	0.342*** (0.075)	0.536*** (0.088)	0.053 (0.032)
Elementary Occupations	-0.116 (0.164)	-1.225*** (0.195)	0.461** (0.147)	-0.021 (0.142)	0.667** (0.204)	0.001 (0.079)
B. Cumulative Hours Worked 2002-2010 (in initial annual hours worked)						
Managers	-0.304 (0.355)	-1.168*** (0.304)	0.081 (0.259)	-0.130 (0.197)	0.854** (0.327)	0.060 (0.080)
Professionals and Techs	-0.487 (0.310)	-0.802*** (0.184)	0.427** (0.158)	-0.536*** (0.157)	0.379 (0.309)	0.045 (0.046)
Clerks and Service Workers	0.002 (0.357)	-0.992*** (0.189)	0.353** (0.124)	0.216 (0.159)	0.494 (0.363)	-0.068 (0.111)
Craft Workers	-0.271 (0.293)	-0.819*** (0.246)	-0.113 (0.169)	0.088 (0.222)	0.623** (0.229)	-0.051 (0.092)
Operators and Assemblers	-0.778*** (0.171)	-1.110*** (0.094)	-0.099 (0.080)	0.200 (0.123)	0.191 (0.143)	0.040 (0.043)
Elementary Occupations	-1.012* (0.468)	-1.295*** (0.212)	0.437* (0.171)	-0.379 (0.299)	0.208 (0.418)	0.017 (0.113)

Notes: The number of observations are 538 (managers), 1474 (professionals and technicians), 1366 (clerks and other service workers), 894 (craftsmen), 4553 (machine operators and assemblers), and 906 (elementary occupations) rows. All regressions include a constant and the full set of controls, $Z_{i,99}^W$ and $Z_{i,99}^F$ except the controls for occupation categories as the regressions are run within occupation samples. Data Source: Statistics Denmark.

Table 10: Workers' Adjustment By Age I, 2002-2010

	(a)	(b)	(c)	(d)	(e)	(f)
All		Initial Firm	other T&C	other Manuf	Service	Other
A. Cumulative Earnings 2002-2010 (in initial annual wage)						
Early Career	-0.380 (0.334)	-0.946*** (0.122)	0.060 (0.122)	-0.140 (0.189)	0.704* (0.309)	-0.058 (0.078)
Mid Career	-0.576** (0.206)	-1.358*** (0.116)	0.174 (0.091)	0.176 (0.119)	0.354 (0.191)	0.078 (0.046)
Late Career	-1.080*** (0.212)	-1.020*** (0.133)	-0.145 (0.115)	0.027 (0.095)	0.132 (0.134)	-0.074 (0.089)
B. Cumulative Employment 2002-2010						
Early Career	0.045 (0.069)	-0.821*** (0.096)	0.109 (0.069)	0.014 (0.082)	0.769*** (0.104)	-0.027 (0.038)
Mid Career	-0.059 (0.068)	-1.273*** (0.102)	0.233** (0.073)	0.208** (0.074)	0.742*** (0.095)	0.031 (0.029)
Late Career	-0.406** (0.130)	-0.950*** (0.125)	0.022 (0.077)	0.065 (0.067)	0.433*** (0.103)	0.023 (0.033)
C. Earnings per year of Employment 2002-2010 (in initial annual wage)						
Early Career	-0.077 (0.043)	-0.033 (0.021)	-0.022 (0.059)	-0.042 (0.102)	-0.077 (0.060)	0.005 (0.137)
Mid Career	-0.077** (0.024)	-0.001 (0.011)	-0.029 (0.032)	0.018 (0.052)	-0.085* (0.039)	0.148 (0.120)
Late Career	-0.136*** (0.028)	-0.030* (0.015)	-0.173 (0.103)	-0.034 (0.083)	-0.147* (0.064)	0.069 (0.188)

Notes: In Panels A and B, the number of observations are 3869, 4077 and 2120 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 1891 (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 between 50 and 56 years old. All regressions include a constant and the full set of controls, $Z_{i,99}^W$ and $Z_{i,99}^F$ except the age variable. Data Source: Statistics Denmark.

Table 11: Workers' Adjustment By Age II, 2002-2010

(a)	(b)	(c)	(d)	(e)	(f)
All	Initial Firm	other T&C	other Manuf	Service	Other
A. Cumulative Hours Worked 2002-2010 (in initial annual hours worked)					
Early Career	-0.203 (0.203)	-0.896*** (0.104)	-0.061 (0.123)	0.712*** (0.198)	-0.044 (0.054)
Mid Career	-0.499** (0.157)	-1.316*** (0.108)	0.146 (0.106)	0.432*** (0.149)	0.048 (0.037)
Late Career	-0.852*** (0.186)	-0.921*** (0.128)	0.007 (0.091)	0.179 (0.132)	-0.070 (0.081)
B. Hours Worked per year of Employment 2002-2010 (in initial annual hours)					
Early Career	-0.043 (0.028)	-0.032* (0.014)	-0.049 (0.055)	-0.050 (0.040)	-0.055 (0.085)
Mid Career	-0.065*** (0.018)	0.001 (0.009)	0.011 (0.044)	-0.074** (0.029)	0.059 (0.103)
Late Career	-0.111*** (0.021)	-0.003 (0.010)	-0.073 (0.081)	-0.146*** (0.054)	-0.049 (0.196)
C. Hourly Rate per year of Employment 2002-2010 (in initial hourly rate)					
Early Career	-0.017 (0.013)	0.004 (0.011)	-0.016 (0.027)	-0.012 (0.018)	-0.039 (0.035)
Mid Career	-0.000 (0.007)	-0.009 (0.007)	-0.007 (0.017)	0.013 (0.012)	0.086* (0.038)
Late Career	-0.016 (0.011)	-0.033* (0.014)	0.009 (0.032)	0.007 (0.024)	0.028 (0.076)

Notes: In Panel A the number of observations are 3869, 4077 and 2120 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 1868 (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 between 50 and 56 years old. All regressions include a constant and the full set of controls, $Z_{i,99}^W$ and $Z_{i,99}^F$ except the age variable. Data Source: Statistics Denmark.

Table 13: MFA Quota Abolishment and Personal Income, 2002-2010

Dep. Var: Cumulative Personal Income 2002-2010 (in initial annual personal income)	
Panel A.	
Cumulative Effect	-0.112 (0.082)
Panel B.	
Initial Firm	-1.071*** (0.066)
Panel C.	
other Manufacturing Jobs	0.203** (0.073)
Panel D.	
non-Manufacturing Jobs	0.716*** (0.099)
Panel E.	
Self-Employed	-0.009 (0.018)
Panel F.	
Unemployed	0.045** (0.016)
Panel G.	
Outside of Labor Market	0.004 (0.034)

Notes: All regressions include a constant and the full set of controls, $Z_{i,99}^W$ and $Z_{i,99}^F$. The number of observations in all panels is 10520. Data Source: Statistics Denmark.

Table 14: Recovery Via Transfers?

	(a)	(b)	(c)
	College	Vocational	High School and less
Panel A. Dep. Var: Cumulative Personal Income 2002-2010 (in initial annual personal income)			
at Initial Firm	-1.084*** (0.229)	-1.131*** (0.112)	-0.997*** (0.089)
at other Manufacturing Jobs	-0.070 (0.224)	0.303** (0.111)	0.143 (0.104)
at non-Manufacturing Jobs	1.413*** (0.263)	0.677*** (0.131)	0.579*** (0.166)
as Self-Employed	-0.057 (0.076)	-0.005 (0.032)	0.006 (0.023)
as Unemployed	0.021 (0.038)	0.065** (0.023)	0.047 (0.025)
Outside of Labor Market	-0.128 (0.071)	0.062 (0.047)	-0.027 (0.054)
Panel B. Dep. Var: Number of Post-WTO Years			
at Initial Firm	-0.946*** (0.188)	-1.080*** (0.102)	-0.938*** (0.080)
at other Manufacturing Jobs	-0.007 (0.174)	0.278** (0.095)	0.173* (0.079)
at non-Manufacturing Jobs	1.105*** (0.183)	0.597*** (0.103)	0.689*** (0.083)
as Self-Employed	-0.001 (0.059)	-0.024 (0.033)	-0.007 (0.018)
as Unemployed	0.038 (0.040)	0.076** (0.026)	0.075** (0.025)
Outside Labor Market	-0.202* (0.087)	0.169** (0.060)	0.018 (0.060)

Notes: All regressions include a constant and the full set of controls, $Z_{i,99}^W$ and $Z_{i,99}^F$, except the controls for education levels as the regressions are ran within education group samples. The number of observations are 1200, 3680, and 5391 respectively for columns (a)-(c). Data Source: Statistics Denmark.

Appendix A

Table A-1: Worker Characteristics in 1999: Demographics, Occupation, Education, Wage, Workplace

Workers with primary employment in T&C in 1999						
Panel A: Demographics						
	Age	Female	Immigrant	Experience	Union Membership	UI Membership
Mean	38.683	0.568	0.066	13.955	0.764	0.872
Std	10.523	0.495	0.249	6.192	0.425	0.334
N	11589	11589	11589	11589	11589	11589
Panel B: Occupation and Education						
	High-Level Occupations	Mid-Level Occupations	Base-Level Occupations	College Education	Vocational Education	High School or Less
Mean	0.082	0.123	0.628	0.113	0.346	0.516
Std	0.275	0.329	0.483	0.316	0.476	0.500
N	11589	11589	11589	11589	11589	11589
Panel C: Wage and Workplace						
	Log Hourly Wage	Log Annual Salary	Log Avg. Hourly Wage	Negative Trend	Positive Trend	Separation Rate
Mean	4.968	12.025	5.030	0.438	0.236	27.352
Std	0.359	0.800	0.181	0.496	0.425	22.163
N	10833	11327	11405	11328	11328	11534

Variables Female, Immigrant, Union Membership, UI Membership, High-Level, Mid-Level and Base-level Occupations, College, Vocational and High School or Less are worker-level indicator variables. Experience is the number of years that a worker has been in the labor market. The variables High-Level, Mid-Level and Base-level Occupations take value 1 if a worker's primary employment is classified under the respective occupation category. The outside category includes workers with auxiliary or unspecified occupations. Variables College, Vocational and High School or Less take value 1 if a worker's highest educational attainment is classified under the respective category. The outside category includes workers who have unspecified educational attainment. Log Hourly Wage is the logarithm of hourly wage of workers in their primary employment. Log Annual Salary is the logarithm of the annual salary of workers in their primary employment. Log Average Hourly Wage is the logarithm of average hourly wages paid in T&C workers' workplaces. 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). Values are expressed in constant year 2000 Danish Kroner. Data Source: Statistics Denmark.

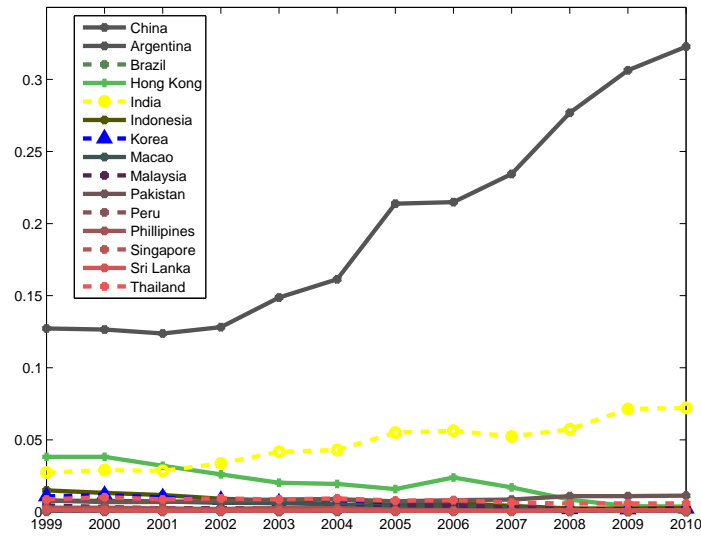


Figure A-1: Import shares of China and other developing countries subject to MFA quotas in Danish Textile and Clothing Imports 1999-2010 (Source: Statistics Denmark)

Table A-2: Worker Characteristics across treated versus untreated groups in 1999

	Age	Female	Immigrant	Experience	College Education	Vocational Education
Panel A: Workers employed in MFA quota producing T&C firms in 1999						
Mean	38.782	0.652	0.055	14.520	0.127	0.351
N	5211	5211	5211	5211	5211	5211
Panel B: Workers employed in non-MFA quota producing T&C firms in 1999						
Mean	38.602	0.500	0.075	13.493	0.101	0.342
N	6378	6378	6378	6378	6378	6378

Variables Female, Immigrant, College, and Vocational Education are worker-level indicator variables. Experience is the number of years that a worker is in the labor market. Variables College, and Vocational Education take value 1 if a worker's highest educational attainment is classified under the respective category. The outside category includes workers who have unspecified educational attainment. Data Source: Statistics Denmark.

Table A-3: Cumulative Worker Variables (2002-2010)

	Mean	Std	N
Cumulative Personal Income (in multiples of initial annual personal income)	9.783	4.941	10520
Cumulative Earnings (in multiples of initial annual earnings)	9.124	9.662	10521
Cumulative Employment	7.065	2.619	10521
Earnings Per Year of Employment (in multiples of initial annual earnings)	1.266	1.284	10101
Cumulative Hours (in multiples of initial annual hours worked)	7.794	5.987	10521
Hours Per Year of Employment (in multiples of initial annual hours worked)	1.124	0.750	10042
Hourly Wage Per Year of Employment (in multiples of initial hourly wage)	1.105	0.405	10042

Cumulative variables are defined over 2002-2010. Earnings, employment, hours worked, and hourly wages are all associated with workers' primary employment. Initial variables are the average across 1999-2000. Cumulative variables are calculated only for individuals who were still in the IDA database in 2010 as individuals may move out of Denmark or die and consequently no longer be in the database. Data Source: Statistics Denmark.