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Abstract

This paper proposes an empirical investigation of the effect of different trade barriers on wages in Egypt. The effect of trade barriers on wage disparity has been widely discussed at both empirical and public policy levels. This debate mainly dealt with traditional tariff barriers. Less attention has been attributed to other barriers such as non-tariff measures and red tape costs. However, these barriers, and in particular red tape costs, are more impeding than tariffs in developing countries. Thus, using a microeconomic dataset, an assessment to what extent different trade barriers affected wage disparity and employment in Egypt will be made. This disparity is studied in three dimensions: on gender (males vs. females), qualification (blue vs. white collar) and regional (urban vs. rural workers). The main findings show that both non-tariff measures and red tape barriers have a higher impact than traditional tariffs on wage disparity. Females, urban workers and blue-collar workers are more affected by such barriers. Finally, when the effects of observable worker characteristics are filtered out, the results are that wage premia are negatively affected by all trade barriers.

ملخص

تقترح هذه الورقة إجراء تحقيق تجريبي لتأثير الحواجز التجارية المختلفة على الأجور في مصر. وقد نوقش أثر الحواجز التجارية على التفاوت في الأجور على نطاق واسع على المستويين التجريبي والعام. هذه المناقشة تناولت أساسا الحواجز الجمركية التقليدية. وضعف الاهتمام بحواجز أخرى مثل التدابير غير الجمركية وتكاليف البيروقراطية. ومع ذلك، فإن هذه الحواجز، ولا سيما التكاليف البيروقراطية، هي التي تعوق أكثر من الرسوم الجمركية في البلدان النامية. وهكذا، سيتم تقييم مدى تأثير الحواجز التجارية المختلفة على التفاوت في الأجور والعمالة في مصر وذلك باستخدام مجموعة بيانات الاقتصاد الجزئي. تتم حاليا دراسة هذا التفاوت في ثلاثة أبعاد : على النوع (ذكور مقابل الإناث) والمؤهل (ذوي الياقات الزرقاء مقابل ذوي الياقات البيضاء) والإقليمية (العمال في المناطق الحضرية مقابل العمال الريفيين). وأظهرت النتائج الرئيسية أن كلا من التدابير غير الجمركية والحواجز البيروقراطية لديها تأثير أعلى من التعريفات التقليدية على التفاوت في الأجور. أكثر المتضررين هم من الإناث، والعمال في المناطق الحضرية والعمال ذوي الياقات الزرقاء من قبل مثل هذه الحواجز. أخيرا، عندما يتم تصفية آثار خصائص العامل بالعينة، تشير النتائج أن علاوات الأجور هي التي تتأثر سلبا من قبل جميع الحواجز التجارية.

1. Introduction

The effect of trade on wage disparity has been widely discussed at both empirical and public policy levels. Yet, the literature on developing countries or least developing ones, reached a quasi consensus that "trade per se" is not the main factor behind wage inequality which may be, at first sight, surprising. This debate mainly dealt with traditional tariff barriers. Less attention has been attributed to other barriers such as non-tariff measures and red tape costs. However, these barriers, and in particular red tape costs, are more impeding than tariffs in developing countries. The United Nations Commission on Trade and Development (UNCTAD, 2001) showed that customs procedures and transactions in developing countries involve between 20 to 30 parties, 27 to 30 stages through many intermediaries, 40 documents, 200 information elements of which 30 have to be repeated at least 30 times. Obviously, those figures show the magnitude and the cost of administrative barriers. The removal of such barriers is likely to have a significant impact on imports, exports, production, employment and hence wages. This is why it is worthwhile to examine whether considering non-tariff measures and administrative barriers could restore the intuitive expectation of a positive link between openness and wage inequality. This paper assesses the effect of administrative barriers along with tariffs and non-tariff measures on wage inequality. Such inequality will be assessed in three dimensions: gender (males vs. females), qualification (blue vs. white collar) and regional (urban vs. rural workers).

Likewise administrative barriers induce distortions on the market, removing them should affect the allocation of resources and/or terms of trade and increase the efficiency of the economy. Two main frameworks could be evoked. The Heckscher-Ohlin-Samuelson (1933 and 1941) model was one of the first attempts to determine the effect of trade on inequality. According to the *Stolper-Samuelson effect*, an increase in the relative price of a good (where the country has a comparative advantage) will lead to a more than proportional increase in the real returns of the factor which is intensively used in the production of that good, and conversely, to a fall in the real returns of the other factor. Such effects are valid when factors are assumed to be mobile between different sectors. Yet, inter-sectoral mobility of the factors of production is relatively low in the short run. This is why the *sector specific model* (Viner, 1931) assumes that one factor of production is specific to a particular industry. A movement towards free trade increases the price of the exportable goods and reduces that of importable ones. Hence, the return of the factors used in the exporting sectors will increase while factors used in the importing sectors will witness a decline of their revenues.

Besides these effects of trade barriers, a couple of remarks are of note with respect to administrative barriers or trade facilitation[1]. First, since these barriers hinder both exports and imports, removing red tape costs increases the terms of trade and welfare at the national level. Consequently, this will eliminate the anti-export bias as the cost of exporting should be lower. This is why, *per se*, workers in all sectors should benefit from such a process, which is not the case in trade liberalization. Yet, taking into account the sectoral second-round effects, some households may witness higher or lower gains (or eventually losses) according to the comparative advantage of the country. Second, trade facilitation encompasses investment in public goods, such as transport and communications infrastructure that improves the efficiency of the trading environment and thus all industries should benefit. A better infrastructure greatly enhances households' welfare, even if they are working in a declining sector. Considering these two points, the impact of trade facilitation is likely to be higher than that of trade liberalization. Moreover, while trade facilitation may amplify the positive effects

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[1]The definition of such a process splits trade facilitation aspects into four major parts: simplification of commercial procedures; harmonization of trade rules; transparent information and procedures and the recourse to new technologies allowing trade promotion (Zaki, 2008).

of trade liberalization, it may also attenuate its negative effects due to the effects mentioned above.

The empirical literature on trade and wage inequality is quite rich but has never considered red tape barriers[2]. This literature can be classified in four main groups. The first one assesses the effect of trade barriers on wage inequality and wage premia in general. Some seminal works are Gaston and Trefler (1994) who found, for the USA, a statistically significant negative effect of tariffs on relative wages and wage premia. Goh and Javorcik (2005) showed that in Poland, workers in sectors with the largest tariff declines experienced the highest increase in wages. In India, these workers suffered the highest relative decrease in wage premia (Dutta, 2007). Said and El Azzawi (2009) examined those issues in Egypt and found that export promotion had the most important effect on wage premia. That is why trade barriers may have a positive or negative effect on wages. The reason behind such different results depend upon the protection and the trade structure. Since barriers represent a distortion on the market, they are associated with an inefficiency and a lower productivity and hence lower wages. By contrast, as they protect workers from foreign competition, they results in higher wages.

The second group determined the relationship between trade policies and skill premium. Bontout and Jean (1998) showed, using a computable general equilibrium model, that sector-biased technical change and North-North trade can significantly increase skilled labor's relative wages. Moreover, Feenstra and Hanson (2001) developed a theoretical model showing that trade in inputs has the same impact on labor demand as does skill-biased technical change since both of these will shift demand away from low-skilled activities and raise relative demand and wages of the better-skilled. Meschi et al (2009) found in Turkey that firms belonging to the sectors that increased their imported inputs from more developed countries witnessed a higher increase in their share of skilled workers. While Blom et al (2004) concluded that trade liberalization in Brazil did not significantly contribute to increased wage inequality between the skilled and unskilled workers through changes in industry wage premia, Araújo et al. (2009) showed that Brazilian manufacturing firms raised their imports of capital goods involving a skill-biased technological change in this sector. Finally, Attanasio et al. (2004) proved that, in Colombia, the increase in the skill premium has been driven by skilled-biased technological change thanks to drastic liberalization.

The third group encompasses studies that assessed the effect of trade barriers on regional inequality. Puga (1999), Puga and Venables (1999) and Sutton (2002) examined the determinants of firms agglomeration and their effects on wage inequality. Paluzie (2001) found that regional inequality rises as international trade in manufacturing increases. Nicita (2004) found that, in Mexico, trade liberalization has contributed to increase in inequality between the south and the north of the country, urban and rural areas, and skilled and unskilled labor. While Goldberg and Pavnick (2007a) failed to find evidence between the trade reforms and the changes in urban poverty in Colombia, Topalova (2005) showed that the decline in tariffs as a result of the sharp trade liberalization appears to have led to a relative increase in the poverty rate and poverty gap in districts of which exposure to liberalization was more intense[3].

Finally, the fourth group includes studies that focused on the link between trade and gender inequality. Among the very first studies, Becker (1971) showed that, theoretically, free trade

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[2]For an extensive literature review, see Goldberg and Pavnick (2007b)

[3]The difference between the two papers lies in the liberalization of the agricultural sector that may have a significant effect on poverty in the short and medium run. While India experienced significant tariff reductions in the agricultural sector, agricultural trade liberalization in Colombia was limited. This is why Colombian poor in rural areas were not affected by the liberalization waves.

implies a more competitive environment and, consequently, a less discriminating economy. Artecona and Cunningham (2002) found that the gender wage gap fell in the industries that were forced to become competitive due to trade liberalization. Similarly, Klein et al. (2010) proved that an increase in exports increases wage inequality along the dimension of skill but in the meantime it reduces the wage inequality associated with gender and nationality differences. In Mexico, Aguayo-Tellez et al. (2010) found that women's relative wage remained stable while employment increased, leading to an increase in women's wage bill share.

In the case of Egypt, existing work has pointed out to persistent inequalities at these different levels. At the regional level, Said (2007) showed that living outside greater Cairo is associated with a wage disadvantage for all sector and gender groups. Concerning gender inequality, Said (2007) also found that, after correcting for productivity differences, the gap in favor of females is only 3% in government sectors and the one in favor of males is 21% in the private sector. El Hamidi (2008) argued that, during trade liberalization periods, the tradables sector experienced higher wage gaps between males and females than the non-tradables sector. Yet, the effect of trade policies and the skill premium has never been studied in the Egyptian case.

In all these studies, red tape barriers were never considered despite their highly negative impact. Therefore, this paper seeks to take a first step towards assessing the effect of different trade barriers on wages in Egypt. Being more affected by trade policies, wage inequality (real hourly wage) is selected rather than income inequality in order to assess the effect of different barriers[4]. This paper has two contributions. First, traditional tariffs, non-tariff measures and red tape barriers are simultaneously taken into account. Second, disparity is studied in three dimensions: gender (males vs. females), qualification (skilled vs. unskilled) and regional (urban vs. rural workers). This is why this paper combines both microeconomic (Egyptian Labor Market Panel Survey, 2006) and macroeconomic (for different types of barriers) datasets. The ad-valorem equivalents (AVEs) of red tape costs are estimated in a companion paper (Zaki, 2009).

The main findings show that non-tariff measures as well as red tape barriers have a higher impact than classic tariffs on wage disparity. Females, urban workers and blue- collar workers are more affected by such barriers. Finally, when the effects of observable worker characteristics are filtered out, the result is that wage premia are negatively affected by all trade barriers.

The paper is organized as follows: Section 2 presents some stylized facts regarding wage disparities. It also gives the main liberalization and facilitation changes that took place in the Egyptian economy. Section 3 displays the methodology. Section 4 is devoted to the data presentation. Section 5 presents the main results and Section 6 concludes.

2. Some Stylized Facts

2.1. Wage Disparities in Egypt

Wage disparities remain a serious issue in Egypt. Such disparity is observed at many levels: gender, qualification and geography. According to the World Bank (2005), the Gini index in Egypt is 32.1. More precisely, the income share held by the lowest 10% of the population is

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[4]According to Milanovic and Squire (2007), the link between policy reforms and wage inequality is likely to be stronger than the link between policy reforms and inequality in total income. The latter is affected by a number of other institutional factors such as the role of social transfers (pension spending or family benefits), demographics of the population and labor force participation. By contrast, wage inequality does not depend on such factors. Thus, the link between trade policy and wages must be stronger than that between trade policy and the distribution of total income.

3.7% and the one held by the lowest 20% is 9%. Those figures are much higher for the highest 20% and 10% (44% and 30% respectively).

Although women's situation has highly improved, they still earn less than men. Yet, as mentioned by Said (2007), the female relative rewards witnessed larger real wage improvements in comparison to their male counterparts between 1998 and 2006 (the gap in favor of females is only 3% in government sectors and the one in favor of males is 21% in the private sector). This is due to the fact that women are concentrated in the government sector that guarantees stability, suitable revenues, flexible maternity leaves and not requiring much time. In this sector, real wages increased by 40% as opposed to only 17% in the private sector. In addition, by observing the most important sectors need-intensive in female labor, textiles and garments, retail and trade; and education and health rank first. In particular, textiles and garments are witnessing a significant openness at both national and international levels. At the national level, import prohibitions were lifted on most textile and clothing products in 2004, through the ministerial decree 161/2004. Meanwhile, the imports of some products are subject to specific administrative formalities, inducing additional red tape costs. Even though quotas seem to have no effect on Egyptian trade, the trade facilitation issues still hinder some imports as well as exports. At the international level, the dismantlement of the Multi-Fiber Agreement (MFA) in January 2005 has put an end to all quota barriers impeding the textiles and garments trade. Consequently, Egypt should face a fierce competition coming from other countries, especially Asian ones whose exports are much more competitive. This, in turn, could have a negative effect on Egyptian exports, employment, wages and hence inequality.

As shown in Table 1, males are distributed in different manufacturing sectors while females are mainly working in textile, garments and food. Therefore, garments liberalization means more trade, higher expansion and greater wages for females who are working in these sectors.

Table 2 shows that almost all the manufacturing sectors (except garments) are more intensive in males than females. Females represent only some 13% of the labor force in the manufacturing sector in Egypt.

Regarding geographical inequality, urban areas and especially Greater Cairo represent a center attracting firms and educated persons to the detriment of other governorates[5]. Thus, workers in the latter will earn less than in the former. Said (2007) showed that living outside greater Cairo is associated with a wage disadvantage for all sector and gender groups. Many efforts have been deployed to reverse these trends in 1990 and succeeded to reduce such disadvantage in 2006, but according to her findings, urban and rural lower Egypt areas still suffer from the greatest disadvantage. Table 1 shows that the distribution of urban and rural workers is the same in different sectors except food and furniture where rural persons are mainly working. Yet, Table 2 points to the fact that urban employment represents 66% of the labor force in the manufacturing sector. Almost all sectors are more intensive in urban workers than rural ones. This shows to what extent the geographical location may affect employment and wages.

Finally, I distinguish skilled and unskilled workers according to their occupation. While the former are white–collar workers (technical and scientific; managers; clerical; sales and services), the latter are blue-collar workers (agriculture and production workers)[6]. Having a look at qualification in different sectors, it is quite clear that garments, textiles, food and beverages and furniture are intensive in unskilled labor or blue collar workers while

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[5]Egypt is divided into 29 governorates.

[6]For the sake of robustness check, skilled and unskilled workers have been distinguished on the basis of their education levels. These figures do not change.

machinery and equipment are more intensive in skilled labor. Unskilled employment represents 75% of the labor force in the manufacturing sector.

Combining these three criterion together (i.e. gender, qualification and region), Table 3 displays the number of workers by segment and by sector. The majority of unskilled females are working in garments (50.5% and 43% in urban and rural areas respectively). Concerning males, skilled ones in urban areas work mainly in machinery, chemicals and food (12.2%, 13.1% and 18.8% respectively).

In summary, all sectors are mainly intensive in urban and blue collar workers. Therefore, trade facilitation and liberalization will primarily benefit these workers as it is shown in Table 4.

After observing the labor market characteristics, Table 5 shows the wages landscape for each segment in Egypt. Since the median is a more robust measure of central tendency than mean, the median of wages for each segment will be used. The median of females wages is always lower than their male counterparts. The highest median wage is that of urban skilled males followed by rural skilled males, urban skilled females and urban unskilled males. On the other extreme, the lowest median wage is the one of rural skilled females, urban and rural unskilled females and rural unskilled males. Such an analysis shows that being a female, unskilled or a rural workers reduces wage. Interestingly, the effect of being a female reduces wages more since urban unskilled males are more paid than urban skilled females.

Bearing in mind these facts regarding the major characteristics of labor and wage disparity, it is important to determine to what extent trade policy affects wage disparities in Egypt. That is why the main characteristics of Egyptian trade policy will be presented.

2.2. Trade Liberalization and Facilitation in Egypt

Since the beginning of the 1990's, Egypt, witnessing both macro and microeconomic changes, has undertaken many trade liberalization policies, in particular through the Economic Reform and Structural Adjustment Program (ERSAP)[7]. The latter is aimed at increasing the private sector participation, opening the economy, privatizing some state owned firms and hence beginning the transition to a market economy. That is why Egypt's trade experienced an increase between 1990 and 2006 thanks to an important decline in tariffs. However, non-tariff measures as well as red tape barriers are still impeding trade as it will be shown below.

Over two decades, Egypt has significantly liberalized its external trade. The maximum tariff rate has decreased from 110% in the end of 1980's to reach 40% in the end of 1990's. In 2004, the government of Egypt launched the second wave of liberalization. Its objectives were twofold: first, to reduce tariffs and rationalize the tariff structure; and second, to reduce the number of products subject to non-tariff barriers. The number of tariff bands was narrowed from 27 tariff brackets to 6, tariff dispersion measured by standard deviation declined from 16.1 in 2000 to 12.7 in 2004 and tariff lines were reduced from 8000 to 6000. Both nominal and effective protection have declined in the manufacturing sector from 21.3% to 12.1% and from 23.3% to 14% respectively after the 2004 reform. All those measures should in turn simplify procedures, minimize tariff evasion, and remove possibilities of discretion and corruption. Figure 1 presents tariffs structure in manufacturing sectors. It is quite clear that tobacco, garments and leather products have a high tariff rate while paper manufacturing, basic metal and transport equipment are characterized by a low protection.

Having a glance on non-tariff measures, the picture is not the same. Figure 2 displays the frequency index of non-tariff measures in Egypt coming from the ``Trade and Production

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[7]For more details about the ERSAP effect, see Korayem (1997).

dataset". Food, beverages, textiles, garments and machinery suffer more than other sectors from such measures since they are subject to many sanitary and phyto-sanitary measures and technical barriers to trade.

Apart from the traditional tariff and non-tariff barriers, red tape procedures for exports and imports remain high and costly in Egypt. In 2007, the former requires 20 days costing U.S.$ 1,014 and the latter 25 days adding some U.S.$ 1,049 to the value of imported goods. Yet, between 2006 and 2009, number of documents to be filed for exports and imports decreased from 8 to 6 documents. The same pattern is observed for time since the number of days to export has fallen from 27 to 15 and from 29 to 18 for imports. Egypt still has a long way to reach better rankings in the ease of doing business or best practise countries in trade facilitation aspects. That is why such administrative barriers, such as tariffs, should obviously have an impact on wages. To better assess the effect of such barriers, I have estimated the ad-valorem equivalent (AVEs) of such barriers in Zaki (2009). Those AVEs take into account the effect of bureaucracy, the internet widespread, corruption and geographical impediments on the time to export and to import. Figure 3 and 4 display those AVEs. Perishable (food), seasonal (textiles and garments) and high value added products (medical equipment and machinery) have higher AVEs than tobacco, coke or wood products that are not sensitive to the transaction time of trade.

To determine which workers will be affected by trade facilitation or trade liberalization, it is important to have a view of the sectors where Egypt has a comparative advantage. As it was mentioned before, according to the sector specific model, individuals working in exporting sectors should benefit since their wages increase. Similarly, the ``Stolper-Samuelson'' model predicts that workers employed in the sectors where a country has a comparative advantage experience an increase of their wages. Figure 5 shows the revealed comparative advantage index for Egypt. The latter has a high comparative advantage in non-metallic products, metals, textiles and garments. Individuals working in these sectors should experience an increase in their wages once trade is facilitated or liberalized.

After analyzing trade policy issues, it is worthwhile to give a brief idea about the Egyptian labor market in order to find the nexus between trade policies and inequality. Table 6 shows that, between 1998 and 2006, the share of individuals working in manufacturing sector has increased from 7.7% to 8.7%. Agriculture share increased also with a similar pattern as industry. Finally, being the most important employer in Egypt, the share of services has significantly increased from 26.4% to 36%. Our focus will be only on the manufacturing sector because it has witnessed the most important liberalization during the last decade.

Taking all those barriers into account, their effect should not be inconsequential on trade, employment and therefore on wage disparity.

3. Methodology

3.1. A One-Step Analysis: the Human Capital Model

To directly assess the effect of trade policy on wage disparity, I use the human capital model (Mincer, 1974) to which different trade barriers are added. The natural logarithm of real hourly wage[8] $Log(w_{igs})$ of individual i living in region g and working in sector s is regressed on individual characteristics (education attainment and experience), other dummies capturing some specific individual f_i (membership in a trade union, working in public sector or being a production worker) and regional f_g characteristics and different trade policy

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[8]Hourly real wages are calculated as the sum of wages earned in the reference month from primary jobs, adjusted for average number of work days per month and average hours per day.

variables (tariffs Tar_s, non-tariff measures NTM_s, the AVEs of the time to export $TimX_s$ and that to import $TimM_s$ capturing the effect of red tape costs). It is also important to include industry indicators that control for non-observable industry characteristics α_{is}. The coefficient on the industry dummy, the wage premium, captures the part of the variation in wages that cannot be explained by worker characteristics, but explained by the workers' industry affiliation.

$$Log(w_{igs}) = \beta_{1i} + \beta_{2i}.X_i + \alpha_{is}wp_s + \gamma_{tar}Tar_s + \gamma_{ntm}NTM_s$$

$$+ \gamma_{tm}TimM_s + \gamma_{tx}TimX_s + \varepsilon_{igs} \qquad (1)$$

with ε_{igs} the discrepancy term.

3.2. A Two-Steps Analysis: the Wage Premia

In order to determine the impact of different trade barriers on wage premia, it was necessary to run the previous model without including trade barriers in it and then retrieve industry effects to be explained by trade barriers in a later stage. In other words, my first step will be as follows:

$$Log(w_{igs}) = \beta_{1i} + \beta_{2i}.X_i + \alpha_{is}wp_s + \varepsilon_{igs} \qquad (2)$$

As per the second step, according to Attanasio et al (2004)[9], since industry wage premia wp_s are obtained by filtering out the effects of observable worker characteristics, they are regressed on a vector of trade policy variables, namely tariffs Tar_s, non-tariff measures NTM_s, the AVEs of time to export $TimX_s$ and that to import $TimM_s$ as follows:

$$(wp_s) = \eta_s + \eta_{tar}Tar_s + \eta_{ntm}NTM_s + \eta_{tm}TimM_s + \eta_{tx}TimX_s + \varepsilon_s \qquad (3)$$

Therefore, it is possible to determine the effect of each barrier on the inter-industry wage premium[10].

Before presenting the data and the results, it is worth noting that one could expect that workers in an industry with high tariffs, non-tariff measures or red tape impediments are paid less than workers with identical characteristics in an industry with low tariffs. Heavily protected industries that are less productive employ also less productive workers who should earn lower wages. Thus, trade reform affects industry-level productivity which in turn boosts wages in these sectors thanks to trade liberalization or facilitation.

4. Data

4.1. Microeconomic Data: ELMPS 2006

Data used in this study are obtained from different sources. First, regarding microeconomic data,the Egyptian Labor Market Panel Survey (ELMPS 2006) is used. The latter is a

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[9]For more details about the wage premium estimation, see Gaston and Trefler (1994), Attanasio et al. (2004), Dutta (2007) and Said and El Azzawi (2009)

[10]To remedy for the sensitivity of the estimated wage premia with respect to the omitted industry dummy, I follow Haisken-DeNew and Schmidt (1997) who have calculated the wage premia as deviations from an employment weighted mean as follows $(wp_s^*) = [I - W]wp_s$ (4) where wp_s^* is the normalized wage differentials, I is an identity matrix and W is a matrix of industry employment weights with each element $w_s = \dfrac{n_s}{\sum_s n_s}$, where n is the number of workers in industry s. Thus, equation 3 is estimated using the normalized wage differentials not the estimated ones.

nationally-representative household survey that consists of a total of 8349 households distributed as follows: a total of 3684 households followed since the Egyptian Labor Market Survey 1998, 2176 new households that split from these households and a refresher sample consisting of 2498 households was also included to ensure that the data continue to be nationally-representative after the split of some households that were present in 1998. Both surveys' questionnaires (Barssoum, 2007) are composed of three major sections: (1) a household questionnaire administered to the head of household or the head's spouse that contains information on basic demographic characteristics of household members, movement of household members in and out of the household since 1998, ownership of durable goods and assets, and housing conditions, (2) an individual questionnaire administered to the individual containing information on parental background, detailed education histories, activity status, job search and unemployment, detailed employment characteristics, a module on women's work, migration histories, job histories, time use, earnings and fertility, (3) a household enterprise and income module that elicits information on all agricultural and non-agricultural enterprises operated by the household as well as all income sources, including remittances and transfers.

My sample is restricted to individuals who are in the working age, between 15 and 64 years old. Only those who are working in the manufacturing sector are taken into account with some 1176 individuals distributed among 20 manufacturing sectors[11] as it is shown in Table 1.

4.2. Macroeconomic Data: Trade Policy Variables

Trade policy variables have different sources. First, tariff data come from the World Trade Organization Tariffs Profile based on the Egyptian customs authority data. Those figures are applied tariffs in 2005 at the 2 digits level.

Second, non-tariff measures come from the CEPII's [12] ``Trade and Production" database that includes the frequency of many non-tariff barriers such as the frequency of quotas, sanitary and phytosanitary measures, technical barriers to trade, etc.

Finally, there is data from the AVEs of the administrative barriers that have been estimated in Zaki (2009)[13] through a theoretical gravity model using the Doing Business dataset (World Bank, 2007). Those estimations are made for the time to export and to import using various administrative barriers, namely bureaucracy, the internet widespread, corruption and geographical impediments (being landlocked or an island). This is why such AVEs can be perceived as an exhaustive measure of red tape costs.

5. Results

Results are organized in three parts. First, a determination will be estimated as to what extent trade barriers differently affect males vs. females, urban vs. rural workers and blue vs. white-collar workers. Moreover, quantile regressions, that are more robust to large outliers, are run to assess the effect of trade policy on different wage quantiles. Second, the effect of trade barriers on wage premia and on employment will be discussed. Finally, some sensitivity analysis will be presented.

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[11]Those sectors are: food and beverages, tobacco, textiles, garments, leather goods, wood products, paper, publishing, coke and petroleum, chemical product, rubber product, non-metallic, basic metal, metallic product, machinery and equipment, electrical equipment, radio and television, medical equipment, transport equipment and furniture.

[12]Centre d'Etudes Prospectives et d'Informations Internationales. They are available on CEPII's website

[13]To estimate the tariff equivalent of non-tariff and administrative barriers, the methodology of Olarreaga et al (2009) has been used.

The human capital model (Mincer, 1974) performs quite well since the findings are consistent with the classical results of the Mincerian equation. Experience has a positive effect and experience squared has a negative effect on wages. The more an individual is educated (captured by the number of years of schooling), the higher the earnings. Living outside Greater Cairo (rural and urban regions in upper and lower Egypt) reduces income significantly. This in turn shows to what extent geographical disparities are a crucial issue in Egypt. Being a member of a trade union is likely to increase the real hourly wage since firms may be willing to pay higher wages if there is a viable threat of collective action. By contrast, a production worker earns less than a non-production one since the coefficient associated with the fact of being a blue collar is negative and statistically significant. Finally, working in the public sector or being a female does not affect wages.

Moving to trade policy variables, tariffs and red tape costs have a negative impact on all workers as it is presented in Column 1 in Table 7. Workers in industries characterized by a high protection are paid less than workers with identical characteristics in an industry with low protection. Since tariffs and administrative barriers induce distortions on the market, they reduce the efficiency and the productivity of firms and thus reduce wages. This is why, once tariffs and red tape costs are eliminated, wages should increase. By contrast, non-tariff measures have a positive effect on all workers. This result is similar to what Jean and Nicoletti (2002) found for the effect of non-tariff barriers on relative wages in OECD countries. This can be explained by the fact that the lack of competition from imports due to high non-tariff barriers raises the demand for labor, which in turn raises wages. Column 2 shows that the interaction between being a female and the different barriers is also significant. Thus, females suffer more than males from trade protection. First, tariffs seem to have a highly significant and negative effect on females' wages. Moreover, and even more importantly, administrative barriers to trade, especially the time to export, have also a significant and negative effect on females. Column 3 displays the effect on males only[14]. While non-tariff measures do not affect males' wages, both tariffs and red tape costs have a negative impact on their wages.

As per the regional level (Table 8), while rural workers are more affected only by tariffs and the time to export, urban ones bear the cost of protection arising from all the barriers because tariffs, non-tariff measures and red tape costs have a negative effect on their wages. Hence, trade facilitation or liberalization should make urban workers better-off. By contrast, given the fact that the majority of rural individuals are working in the agriculture sector where Egypt does not have a comparative advantage, once trade is opened, farmers should be negatively affected which will increase the gap between rural and urban workers.

Turning to the effect of different barriers on blue vs. white-collar workers, Table 9 reveals that the former are much more affected by all trade barriers than the latter. Non-tariff measures and red tape barriers seem to be more onerous than tariffs for unskilled workers as they have a higher negative impact on their wages. This is in line with the sectors where Egypt has a comparative advantage and that are mainly intensive in blue-collar workers. Therefore, when trade is liberalized or facilitated, these sectors must expand, demand for blue-collar workers will increase and consequently their wages.

It is important to notice that tariffs have a negative impact on white-collar workers. More protected industries should witness less wages with respect to more opened ones. The link is as follows: the more the industry is open, the more firms will be productive so as to be able to export and to face fierce competition. Therefore they will hire skilled workers and their wages should increase. Such a result is consistent with the literature since it was stated that

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[14]I ran the regressions on males only since the number of females in my dataset is quite small (around 150 women).

the increase in the skill premium was primarily driven by skilled-biased technological change after periods of trade liberalization and the increased foreign competition to which the trade reform exposed domestic producers.

Table 9 shows also that experience and education matter more for white-collar workers than for blue-collar ones. This is explained by the skills that are acquired through education and on-the-job-training and that are required by highly-qualified occupations (such as managers, clerical, etc.). The membership in a trade union increases wages for both of the two groups.

Finally, in order to have a better investigation of the effect on skilled workers, quantile regressions should be observed since they provide a more precise picture of the wage distribution in the sample. Workers in the highest quantile ($90th$) are affected only by tariffs. This confirms the result obtained for white-collar workers that are only impacted by tariffs. Workers in the other quantiles are affected by either non-tariff measures or red tape costs or both of them. Concerning non-tariff measures, the higher the quantile, the higher the coefficient as they are -0.13, -0.18, -0.25 and -0.24 for the $10th$, $25th$, $50th$ and $75th$ quantiles respectively. In addition, the time to export is highly significant for the $75th$ and the $90th$ quantiles. Such a point proves that Egypt has to consider those implicit barriers to trade because they have a more important effect on wages. Finally, the coefficients of regional dummies are also negative and significant showing that an individual working in upper or lower Egypt earns less than the one working in Cairo with the same characteristics.

To conclude, it is important to note that non-tariff measures as well as red tape barriers have a higher impact than classic tariffs on wages of females, urban workers and blue-collar workers. Therefore, the elimination of such barriers will primarily benefit those categories.

Moving to the wage premia, as it is shown in Table 11, tariffs, the time to export and non-tariff measures have a significantly negative effect on the wage premium. The time to import is not significant. This implies that increasing protection in a particular sector reduces wages in that sector. In other words, more trade liberalization and facilitation mean higher wages. Recall that those industry wage premia are conditioned on workers characteristics in the first stage, therefore, the relationship between different barriers and wage premia are not driven by observable differences in workers composition.

Finally, Table 12 presents the effect on employment. It indicates that the share of skilled workers in each industry is inversely related to tariffs showing that industries with larger tariff reductions experienced more rapid skilled-biased technological change, as measured by the proportion of skilled workers. This is consistent with the ``defensive innovation'': firms in sectors facing intensified import competition look for new methods of production that economize on unskilled labor (Thoenig and Verdier, 2003). Such a result confirms the fact that skilled workers are the most negatively affected by trade barriers. By contrast, unskilled workers are more affected by the time to export. These findings confirm the previous ones regarding blue vs. white–collar workers.

Whereas the time to import does not affect any type of employment, that to export seems to have a negative and significant effect on all workers, females, rural and unskilled workers. Non-tariff barriers have a highly positive and statistically significant effect on employment pointing to the fact that such barriers seem to protect workers from foreign competition and therefore thier employment.

Tables 13, 14 and 15 displays some robustness checks for results. First, the wage coming from all jobs is used as a dependant variable instead of the one coming from the primary job. It turns out that results remain the same (Tables 13) for different segments.

To control for trade shares, sector dummies are suppressed and exports and imports shares in total output are introduced. Figures 6 and 7 and Table 14 show that the higher the exports shares, the higher the negative effect of the ad-valorem equivalent of the time to export on wages. In addition, the higher the imports share, the higher the negative effect of tariffs on wages. This shows that the majority of exporting and importing sectors are the most affected by red tape costs and tariffs respectively.

Finally, skilled and unskilled workers were previously distinguished according to their occupation. Here, they are differentiated on the basis of their education level[15]. As it is shown in Table 15, unskilled workers (or blue collar) are more affected by all type of barriers.

6. Conclusion

This paper proposes an empirical investigation of the effect of different trade barriers on wages in Egypt. The effect of trade barriers on wage disparity has been widely discussed at both empirical and public policy levels. This debate mainly dealt with traditional tariff barriers. Less attention has been attributed to other barriers such as non-tariff measures and red tape costs. However, these barriers, and in particular red tape costs, are more impeding than tariffs in developing countries. Thus, using a microeconomic dataset, an assessment was made as to what extent different trade barriers affected wage disparities and employment in Egypt. These disparities are studied in three dimensions: on gender (males vs. females), qualification (skilled vs. unskilled) and regional (urban vs. rural workers). The main findings show that both non-tariff measures and red tape barriers have a higher impact than traditional tariffs on wage disparity. Females, urban workers and blue-collar workers are more affected by such barriers. Finally, when the effects of observable worker characteristics are filtered out, the results are that wage premia are negatively affected by all trade barriers.

From a policymaking standpoint, such a study points to some crucial implications. First, since barriers associated to trade facilitation are a deadweight loss, all agents and sectors should gain from such a process. That is why developing countries must pursue reforms in order to eliminate non-official (border-related procedures) barriers that are less transparent. Second, since administrative barriers have a higher adverse effect on wage disparity than traditional tariffs, the government of Egypt should focus on trade facilitation rather trade liberalization to boost trade, and consequently production, labor demand and wages. Third, as Egypt has a comparative advantage in sectors that are highly intensive in blue-collar workers, the government must put in place a policy aiming at liberalizing and developing these sectors in order to generate new employment opportunities and reducing unemployment among them. Providing technical training for these workers is crucial to increase their productivity in order to better face the fierce competition once the economy is more exposed to the rest of the world. Finally, for females in particular, since they are working in sectors characterized by a comparative advantage, the trade facilitation and liberalization of these sectors is likely to increase female's employment.

The findings of this study suggest three potential areas for future research. First, is that developing a theoretical model would be crucial in providing better insights of the trade facilitation effects on wage inequality. Moreover, it would be interesting to apply the same analysis for services and agriculture given the importance of the former and the high protection of the latter in Egypt. Last but not least, in order to determine the evolution of trade policy in Egypt, the panel dimension should be used. Clearly, this can be done once data for administrative and non-tariff barriers are available.

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[15]Skilled workers are those who have higher than intermediate level of education and unskilled ones have a lower than intermediate education.

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Figure 1: Tariff Barriers in Egypt
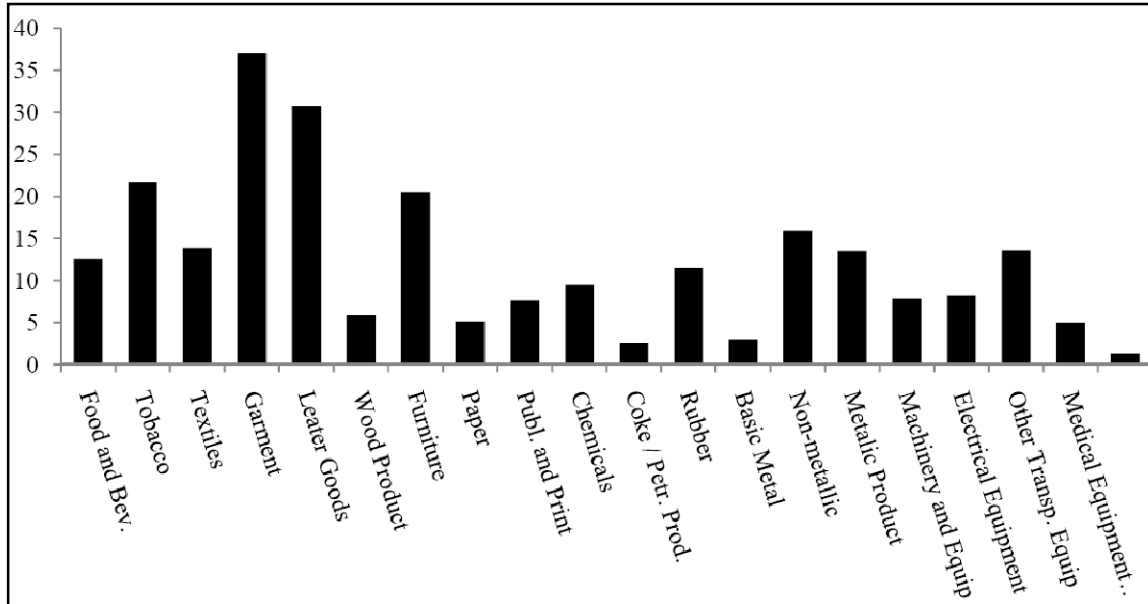
Note: Figures show the ad-valorem applied tariffs in percentage.
Source: Constructed by the author from the World Tariff Profile.

Figure 2: Non-Tariff Barriers in Egypt
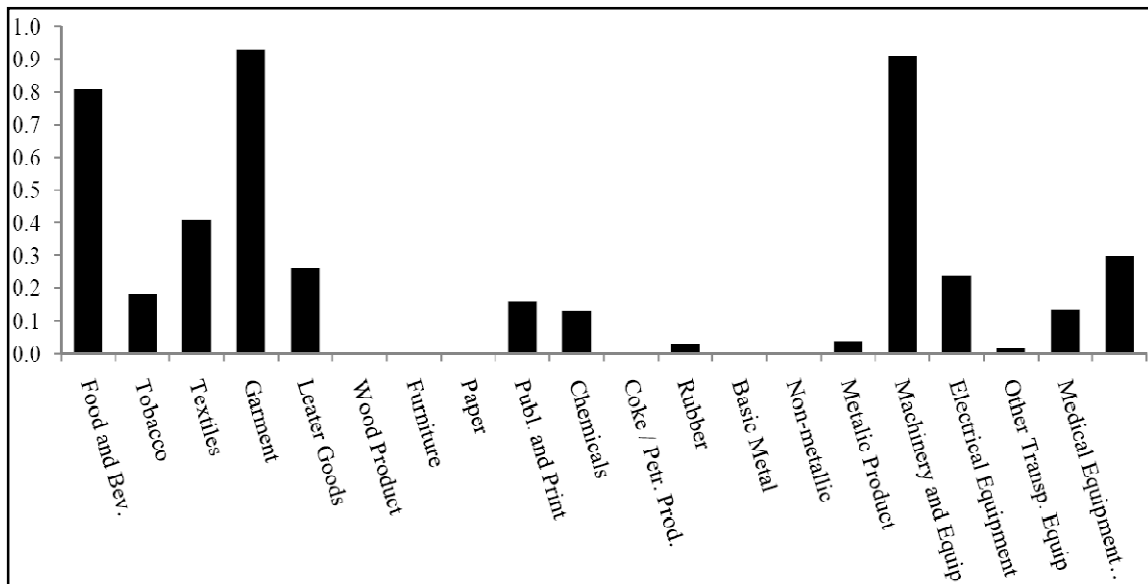
Note: Figures show the frequency index of non-tariff measures (scaled from 0 to 1. The higher the value of the index, the more frequent the non-tariff measures).
Source: Constructed by the author from the Trade and Production dataset.

Figure 3: Ad Valorem Equivalent of Time to Import
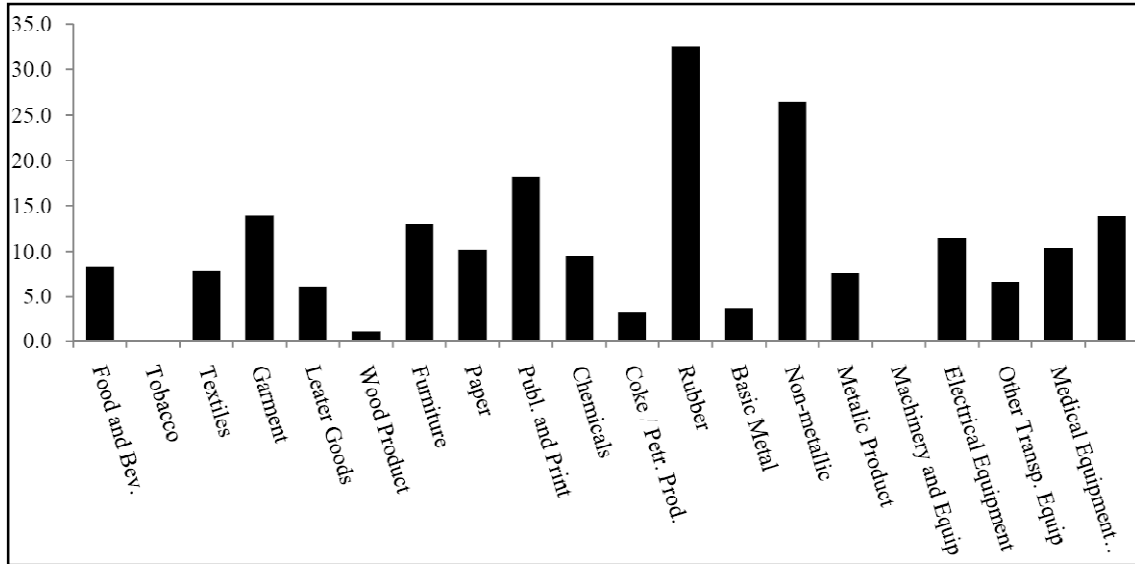
Note: Figures show the estimated ad-valorem equivalent of time to import in percentage.
Source: Constructed by the author.

Figure 4: Ad Valorem Equivalent of Time to Export
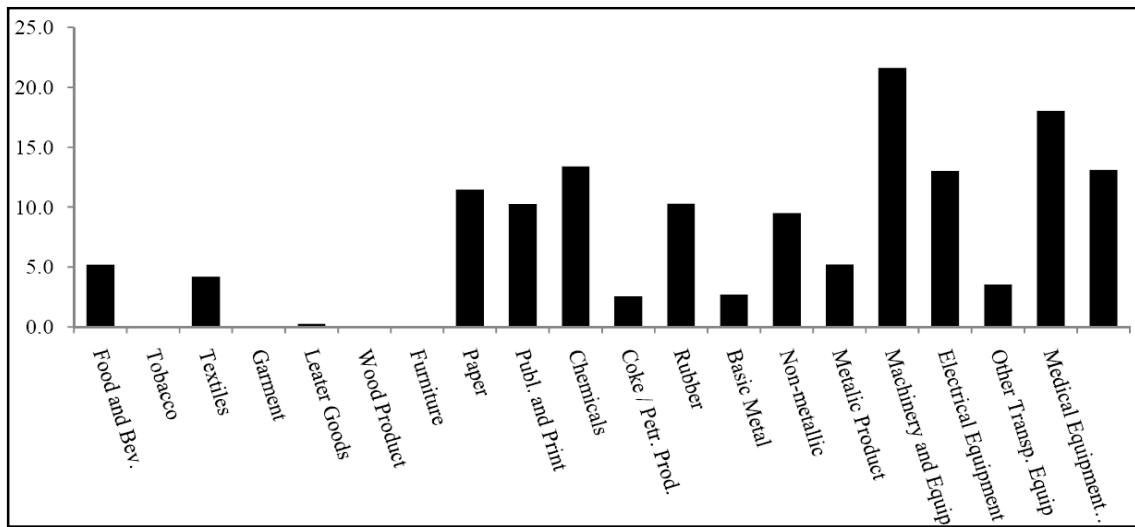
Note: Figures show the estimated ad-valorem equivalent of time to export in percentage.
Source: Constructed by the author.

Figure 5: Revealed Comparative Advantage in Egypt
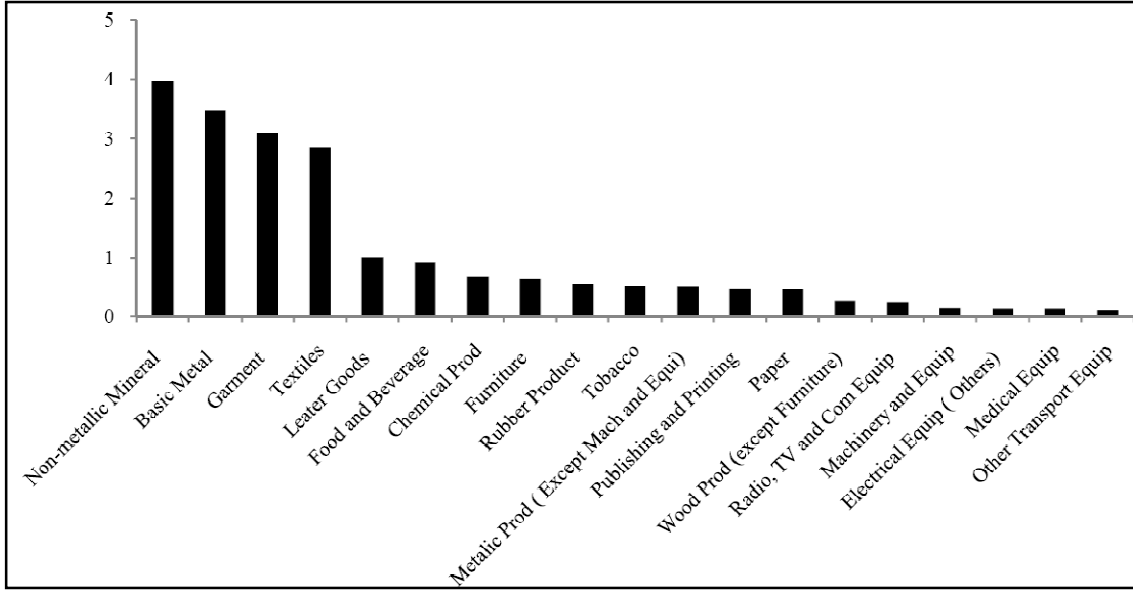
Note: Figures show the revealed comparative advantage index in Egypt computed as follows:

$$RCA = \frac{\dfrac{X_{ij}}{\sum_i X_j}}{\dfrac{X_{iw}}{\sum_i X_w}}$$ where X_{ij} and X_{iw} are the values of country j 's exports of product i and world exports of product

i and where $\sum_i X_j$ and $\sum_i X_w$ refer to the country j 's total exports and world total exports. If the index is higher than unity, the country has a revealed comparative advantage in the product.
Source: Constructed by the author from Trade and Production.

Figure 6: Interacting Trade Shares and Trade Barriers: Time to Export
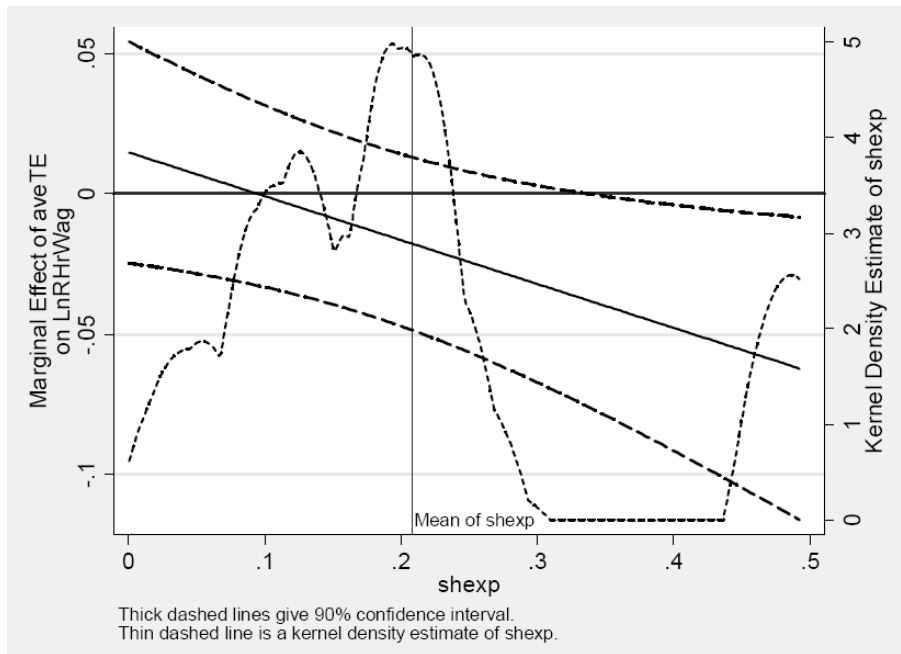
Source: Constructed by the author.

Figure 7: Interacting Trade Shares and Trade Barriers: Tariffs

Thick dashed lines give 90% confidence interval.
Thin dashed line is a kernel density estimate of shimp.
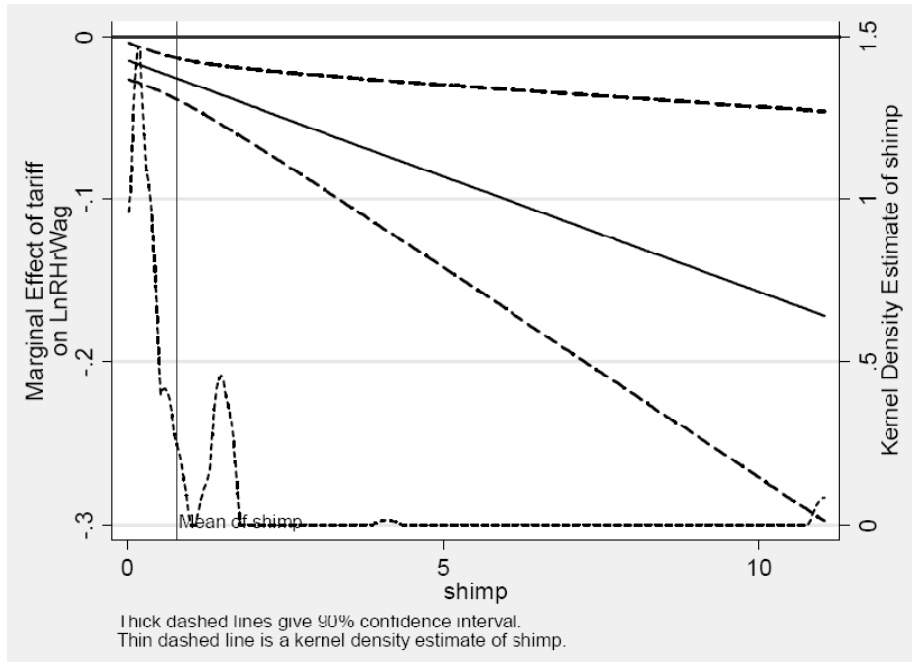
Source: Constructed by the author.

Table 1: Distribution of Labor in Manufacturing: by gender, qualification and regions, 2006

	Males (%)	Females (%)	Urban (%)	Rural (%)	Unskilled (%)	Skilled (%)	Total (%)
Food and Beverage	19.1	18.0	16.6	23.6	19.0	18.9	19.0
Tobacco	0.7	0.7	0.9	0.3	0.5	1.3	0.7
Textiles	9.8	14.0	10.6	10.0	10.4	10.3	10.4
Garment	6.5	39.3	12.6	7.0	12.5	5.6	10.7
Leather Goods	2.0	4.0	3.0	1.0	3.0	0.3	2.3
Wood Product (except furniture)	3.0	0.7	1.9	4.3	3.7	0.0	2.7
Paper	1.8	1.3	1.7	1.8	1.9	1.0	1.7
Publishing and Printing	3.4	2.0	3.7	2.3	2.4	5.6	3.2
Coke and Petroleum Products	4.6	4.0	5.5	2.5	2.4	10.6	4.5
Chemical Product	7.3	8.7	9.7	3.3	6.1	11.6	7.5
Rubber Product	1.2	0.0	0.8	1.5	1.0	1.0	1.0
Non-metallic Mineral	9.6	1.3	6.7	12.0	9.3	6.3	8.5
Basic Metal	2.6	0.7	2.4	2.3	2.1	3.3	2.4
Metallic Product	7.5	0.0	7.5	4.8	7.2	4.7	6.5
Machinery and Equipment	5.1	1.3	5.5	2.8	2.6	10.3	4.6
Electrical Equipment	0.5	1.3	0.5	0.8	0.3	1.3	0.6
Radio, TV and Com. Equip.	0.9	0.7	1.0	0.5	0.1	3.0	0.9
Medical Equipment	0.3	1.3	0.6	0.0	0.1	1.3	0.4
Other Transport Equipment	0.6	0.7	0.8	0.3	0.2	1.7	0.6
Furniture	13.5	0.0	8.0	19.3	15.3	1.7	11.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Constructed by the author from ELMPS, 2006.

Table 2: Distribution of Labor in Manufacturing: by gender, qualification and regions, 2006

	Males (%)	Females (%)	Urban (%)	Rural (%)	Unskilled (%)	Skilled (%)	Total (%)
Food and Beverage	87.9	12.1	57.9	42.2	74.4	25.6	100.0
Tobacco	87.5	12.5	87.5	12.5	50.0	50.0	100.0
Textiles	82.8	17.2	67.2	32.8	74.6	25.4	100.0
Garment	53.2	46.8	77.8	22.2	86.5	13.5	100.0
Leather Goods	77.8	22.2	85.2	14.8	96.3	3.7	100.0
Wood Product (exp Furnit)	96.9	3.1	46.9	53.1	100.0	0.0	100.0
Paper	90.0	10.0	65.0	35.0	85.0	15.0	100.0
Publishing and Printing	92.1	7.9	76.3	23.7	55.3	44.7	100.0
Coke and Petro. Products	88.7	11.3	81.1	18.9	39.6	60.4	100.0
Chemical Product	85.2	14.8	85.2	14.8	60.2	39.8	100.0
Rubber Product	100.0	0.0	50.0	50.0	75.0	25.0	100.0
Non-metallic Mineral	98.0	2.0	52.0	48.0	81.0	19.0	100.0
Basic Metal	96.4	3.6	67.9	32.1	64.3	35.7	100.0
Metallic Product	100.0	0.0	75.3	24.7	81.8	18.2	100.0
Machinery and Equipment	96.3	3.7	79.6	20.4	42.6	57.4	100.0
Electrical Equipment	71.4	28.6	57.1	42.9	42.9	57.1	100.0
Radio, TV and Com. Equip.	90.0	10.0	80.0	20.0	10.0	90.0	100.0
Medical Equipment	60.0	40.0	100.0	0.0	20.0	80.0	100.0
Other Transport Equipment	85.7	14.3	85.7	14.3	28.6	71.4	100.0
Furniture	100.0	0.0	44.6	55.4	96.4	3.6	100.0
Total	87.2	12.8	66.1	33.9	74.4	25.6	100.0

Source: Constructed by the author from ELMPS, 2006.

Table 3: Employment by Sector and by Segment, 2006

	Males				Females				
	Skilled		Unskilled		Skilled		Unskilled		
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Total
Food and beverage	40	11	76	69	5	1	8	13	223
Tobacco	3	0	3	1	1	0	0	0	8
Textiles	16	8	49	28	7	0	10	4	122
Garment	8	0	47	12	8	1	35	15	126
Leather	1	0	17	3	0	0	5	1	27
Wood prod (exp. furnit)	0	0	15	16	0	0	0	1	32
Paper	3	0	8	7	0	0	2	0	20
Publishing and printing	10	4	16	5	3	0	0	0	38
Coke and petrol. products.	23	3	15	6	5	1	0	0	53
Chemical products	28	1	35	11	6	0	6	1	88
Rubber products.	2	1	4	5	0	0	0	0	12
Non-metallic mineral	17	0	33	48	2	0	0	0	100
Basic metal	7	2	11	7	1	0	0	0	28
Metallic products	12	2	46	17	0	0	0	0	77
Machinery and	26	4	15	7	1	0	1	0	54
Electrical equip. (other)	1	2	1	1	1	0	1	0	7
Radio, TV and com. equip	7	1	0	1	1	0	0	0	10
Medical equip	2	0	1	0	2	0	0	0	5
Other transport equip	3	1	2	0	1	0	0	0	7
Furniture	4	1	58	76	0	0	0	0	139
Total	213	41	452	320	44	3	68	35	1176

Source: Constructed by the author from ELMPS, 2006.

Table 4: Employment by Sector and by Segment, 2006

	Males				Females				RCA
	White Collar		Blue Collar		White Collar		Blue Collar		
	Urban (%)	Rural (%)	Urban (%)	Rural (%)	Urban (%)	Rural (%)	Urban (%)	Rural (%)	
Coke and Petrol. Prod	43.4	5.7	28.3	11.3	9.4	1.9	0.0	0.0	25.44
Non-metallic Mineral	17.0	0.0	33.0	48.0	2.0	0.0	0.0	0.0	3.97
Basic Metal	25.0	7.1	39.3	25.0	3.6	0.0	0.0	0.0	3.47
Garment	6.3	0.0	37.3	9.5	6.3	0.8	27.8	11.9	3.09
Textiles	13.1	6.6	40.2	23.0	5.7	0.0	8.2	3.3	2.86
Leather Goods	3.7	0.0	63.0	11.1	0.0	0.0	18.5	3.7	1.01
Food and Beverage	17.9	4.9	34.1	30.9	2.2	0.4	3.6	5.8	0.92
Chemical Product	31.8	1.1	39.8	12.5	6.8	0.0	6.8	1.1	0.69
Furniture	2.9	0.7	41.7	54.7	0.0	0.0	0.0	0.0	0.65
Rubber Product	16.7	8.3	33.3	41.7	0.0	0.0	0.0	0.0	0.57
Tobacco	37.5	0.0	37.5	12.5	12.5	0.0	0.0	0.0	0.53
Metallic Prod	15.6	2.6	59.7	22.1	0.0	0.0	0.0	0.0	0.52
Publishing and Printing	26.3	10.5	42.1	13.2	7.9	0.0	0.0	0.0	0.49
Paper	15.0	0.0	40.0	35.0	0.0	0.0	10.0	0.0	0.47
Wood Product	0.0	0.0	46.9	50.0	0.0	0.0	0.0	3.1	0.26
Radio, TV and Com Equip.	70.0	10.0	0.0	10.0	10.0	0.0	0.0	0.0	0.24
Machine and Equip	48.1	7.4	27.8	13.0	1.9	0.0	1.9	0.0	0.14
Electrical Equip.	14.3	28.6	14.3	14.3	14.3	0.0	14.3	0.0	0.13
Medical Equip.	40.0	0.0	20.0	0.0	40.0	0.0	0.0	0.0	0.13
Other Transp. Equip.	42.9	14.3	28.6	0.0	14.3	0.0	0.0	0.0	0.10

Source: Constructed by the author from ELMPS, 2006.

Table 5: Wages by Segment, 2006

			Workers		Wages				
			Number	Share (%)	Mean	Median	Std Dev	Min	Max
Males	Skilled	Urban	213	18.11	5.59	3.12	10.91	0.80	137.88
		Rural	41	3.49	2.59	2.18	1.48	0.50	7.05
	Unskilled	Urban	452	38.44	2.81	1.92	4.95	0.27	76.70
		Rural	320	27.21	2.15	1.80	1.73	0.38	22.25
Females	Skilled	Urban	44	3.74	3.25	2.14	3.87	0.27	23.08
		Rural	3	0.26	13.64	0.86	22.16	0.83	39.23
	Unskilled	Urban	68	5.78	2.98	0.96	10.72	0.23	86.67
		Rural	35	2.98	3.41	1.00	8.44	0.60	48.27
Total			1176	100.00	3.20	2.00	6.59	0.23	137.88

Source: Constructed by the author from ELMPS, 2006.

Table 6: Distribution of Labor in Different sectors, 2006

Economic Activity	1998 (%)	2006 (%)
Agriculture & Fishing	6.34	8.62
Min., Manuf. & Electr.	7.66	8.67
Construction	2.75	3.76
Wholes., Hotels & Restaurants.	6.53	10.87
Transportation storage & communication.	2.85	3.94
Financial & business activity	0.95	1.75
Public Service	13.29	15.73
Other Econ. Activity	2.48	1.73
Other Status (unemployment, out of labor force)	57.15	44.93
Total	100	100

Source: Constructed by the author from ELMPS, 2006.

Table 7: Trade Policy and Wages by Gender, 2006

	1 All Ln (Hr. Wage)	2 All Ln (Hr. Wage)	3 Males Ln (Hr. Wage)
Tariff	-0.00701***	0.000610	-0.00593***
	(0.000769)	(0.00158)	(0.000857)
Non Tariff	0.0922***	0.0814	-2.49e-05
	(0.0198)	(0.0492)	(0.0174)
AVE Time Exp	-0.0118***	-0.00640**	-0.00843***
	(0.00240)	(0.00241)	(0.00182)
AVE Time Imp	-0.00376***	-0.00322*	-0.00521***
	(0.000392)	(0.00156)	(0.000459)
Public	0.0211	0.0204	0.00537
	(0.0416)	(0.0432)	(0.0441)
Experience	0.0370***	0.0368***	0.0360***
	(0.00577)	(0.00557)	(0.00624)
Experience Sq.	-0.000406***	-0.000395***	-0.000377**
	(0.000132)	(0.000128)	(0.000138)
Years of Schooling	0.0261***	0.0277***	0.0279***
	(0.00603)	(0.00590)	(0.00663)
Trade Union	0.394***	0.390***	0.372***
	(0.0512)	(0.0501)	(0.0624)
Not Cairo	-0.120**	-0.122***	-0.131***
	(0.0427)	(0.0424)	(0.0433)
Blue Collar	-0.133***	-0.131**	-0.158***
	(0.0461)	(0.0466)	(0.0540)
Female	-0.166	0.455	
	(0.132)	(0.307)	
Female*AVE TE		-0.0525***	
		(0.0148)	
Female*AVE TM		-0.00413	
		(0.0114)	
Female*Tariff		-0.0329***	
		(0.00769)	
Female*NTB		0.542**	
		(0.220)	
Constant	0.295***	0.120	0.320**
	(0.0943)	(0.100)	(0.124)
Industry dummies	YES	YES	YES
Observations	1176	1176	1026
R-squared	0.320	0.331	0.326

Notes: (i.)Standard errors in parentheses. (ii.)Standard errors are clustered by industries. (iii.) ***, ** and * represent respectively statistical significance at the 1%, 5% and 10% levels.

Table 8: Trade Policy and Wages by Region, 2006

	1 Urban Ln (Hr. Wage)	2 Rural Ln (Hr. Wage)
Tariff	-0.00613***	-0.0164***
	(0.00111)	(0.00430)
Non Tariff	-0.0652**	0.164
	(0.0260)	(0.140)
AVE Time Exp	-0.00472***	-0.0171***
	(0.00157)	(0.00202)
AVE Time Imp	-0.00729***	-0.00227
	(0.000722)	(0.00340)
Public	-0.0548	0.125*
	(0.0433)	(0.0647)
Experience	0.0515***	0.0197**
	(0.00726)	(0.00882)
Experience Sq.	-0.000604***	-0.000179
	(0.000195)	(0.000181)
Years of Schooling	0.0421***	0.00774
	(0.00574)	(0.00782)
Trade Union	0.386***	0.380**
	(0.0761)	(0.132)
Blue Collar	-0.0275	-0.281***
	(0.0415)	(0.0827)
Female	-0.302***	0.112
	(0.0870)	(0.340)
Constant	-0.0498	0.654**
	(0.0991)	(0.229)
Industry dummies	YES	YES
Observations	777	399
R-squared	0.403	0.186

Notes: (i.)Standard errors in parentheses. (ii.)Standard errors are clustered by industries. (iii.) ***, ** and * represent respectively statistical significance at the 1%, 5% and 10% levels.

Table 9: Trade Policy and Wages by Qualification, 2006

	1 Blue Collar Ln (Hr. Wage)	2 White Collar Ln (Hr. Wage)
Tariff	-0.0182***	-0.00781**
	(0.000832)	(0.00318)
Non Tariff	-0.124**	-0.0403
	(0.0446)	(0.0549)
AVE Time Exp	-0.0203***	-0.00137
	(0.00233)	(0.00158)
AVE Time Imp	-0.0132***	0.00425
	(0.000771)	(0.00275)
Public	0.0962***	-0.0518
	(0.0277)	(0.0804)
Experience	0.0300***	0.0570***
	(0.00610)	(0.0154)
Experience Sq.	-0.000302**	-0.000796*
	(0.000139)	(0.000399)
Years of Schooling	0.0145***	0.0562***
	(0.00426)	(0.0130)
Trade Union	0.371***	0.316***
	(0.0598)	(0.0968)
Not Cairo	-0.151***	-0.0619
	(0.0503)	(0.0671)
Female	-0.147	-0.256
	(0.173)	(0.165)
Constant	0.771***	-0.273
	(0.0869)	(0.291)
Industry dummies	YES	YES
Observations	824	352
R-squared	0.222	0.367

Notes: (i.)Standard errors in parentheses. (ii.)Standard errors are clustered by industries. (iii.) ***, ** and * represent respectively statistical significance at the 1%, 5% and 10% levels.

Table 10: Trade Policy and Wages by Quantiles, 2006

	10th	25th	50th	75th	90th
	Ln (Hr. Wage)	Ln (Hr. Wage)	Ln (Hr. Wage)	Ln (Hr. Wage)	Ln (Hr. Wage)
Tariff	0.00212	0.00120	3.28e-05	-0.00555	-0.0147**
	(0.00422)	(0.00296)	(0.00407)	(0.00349)	(0.00738)
Non Tariff	-0.134*	-0.182**	-0.255***	-0.237***	0.0207
	(0.0737)	(0.0747)	(0.0732)	(0.0627)	(0.136)
AVE Time Exp	-0.00436	-0.00972**	-0.00976***	-0.0173***	-0.0377***
	(0.00570)	(0.00473)	(0.00378)	(0.00474)	(0.00961)
AVE Time Imp	-0.00564	-0.00134	-0.00599*	-0.00909***	0.00374
	(0.00503)	(0.00304)	(0.00341)	(0.00273)	(0.00653)
Public	0.0261	0.0484	-0.000850	-0.00114	0.0870
	(0.0671)	(0.0640)	(0.0577)	(0.0598)	(0.119)
Experience	0.0443***	0.0412***	0.0436***	0.0406***	0.0323***
	(0.00880)	(0.00683)	(0.00499)	(0.00498)	(0.00889)
Experience Sq.	-0.000648***	-0.000540***	-0.000580***	-0.000480***	-0.000224
	(0.000213)	(0.000181)	(0.000121)	(9.26e-05)	(0.000182)
Years of School	0.0265***	0.0211***	0.0235***	0.0277***	0.0341***
	(0.00697)	(0.00587)	(0.00547)	(0.00568)	(0.00893)
Trade Union	0.250***	0.318***	0.332***	0.374***	0.392**
	(0.0725)	(0.0643)	(0.0476)	(0.0494)	(0.200)
Not Cairo	-0.127**	-0.0700	-0.0434	-0.0728*	-0.253*
	(0.0505)	(0.0498)	(0.0533)	(0.0397)	(0.132)
Prod. Work	-0.170*	-0.181***	-0.173***	-0.132**	-0.280*
	(0.0936)	(0.0653)	(0.0385)	(0.0601)	(0.170)
Female	-0.325***	-0.309***	-0.365***	-0.290***	-0.213
	(0.0983)	(0.0892)	(0.0600)	(0.0600)	(0.406)
Constant	-0.336**	-0.0113	0.385***	0.828***	1.417***
	(0.160)	(0.143)	(0.0836)	(0.0987)	(0.360)
Observations	1176	1176	1176	1176	1176

Notes: (i.)Standard errors in parentheses. (ii.) ***, ** and * represent respectively statistical significance at the 1%, 5% and 10% levels.

Table 11: Trade Policy and Wage Premium, 2006

	Wage Premium
Tariff	-0.0756***
	(0.00763)
Time to Imp.	-0.00146
	(0.00523)
Time to Exp.	-0.0220*
	(0.0103)
Non-Tariff	-0.355*
	(0.174)
Share of females	0.620
	(0.712)
Constant	1.300***
	(0.198)
Observations	20
R-squared	0.941

Notes: (i.)Robust standard errors in parentheses. (ii.) ***, ** and * represent respectively statistical significance at the 1%, 5% and 10% levels.

Table 12: Trade Policy and Employment, 2006

	Shr. of Emp.	Shr. of Rural	Shr. of Urban	Shr. of Males	Shr. of Females	Shr. of Unskilled	Shr. of Skilled
Tariff	-0.00134	-0.00227	-0.000855	-0.00157	0.000285	-0.000733	-0.00309*
	(0.00161)	(0.00229)	(0.00144)	(0.00182)	(0.00218)	(0.00177)	(0.00161)
Time to Imp.	0.00196	0.00317	0.00133	0.00181	0.00293	0.00233	0.000863
	(0.00137)	(0.00195)	(0.00123)	(0.00154)	(0.00185)	(0.00151)	(0.00137)
Time to Exp.	-0.00439*	-0.00638*	-0.00338	-0.00410	-0.00643**	-0.00503*	-0.00256
	(0.00223)	(0.00317)	(0.00199)	(0.00251)	(0.00300)	(0.00245)	(0.00223)
Non-Tariff	0.117**	0.124*	0.113***	0.0977*	0.249***	0.111**	0.135***
	(0.0420)	(0.0597)	(0.0375)	(0.0473)	(0.0566)	(0.0461)	(0.0420)
Constant	0.0516*	0.0634	0.0455*	0.0582*	0.00636	0.0463	0.0669**
	(0.0272)	(0.0387)	(0.0243)	(0.0307)	(0.0367)	(0.0299)	(0.0272)
Observations	20	20	20	20	20	20	20
R-squared	0.425	0.322	0.465	0.276	0.709	0.440	0.434

Notes: (i.)Robust standard errors in parentheses. (ii.) ***, ** and * represent respectively statistical significance at the 1%, 5% and 10% levels.

Table 13: Robustness Check 1: Wages from all Jobs

	All	All	Males	Urban	Rural	Blue Collar	White Collar
Tariff	-0.00691***	0.000954	-0.00579***	-0.00623***	-0.0158***	-0.0181***	-0.00748**
	(0.000770)	(0.00156)	(0.000857)	(0.00110)	(0.00438)	(0.000841)	(0.00317)
Non Tariff	0.0848***	0.0764	-0.00807	-0.0581**	0.152	-0.127***	-0.0448
	(0.0196)	(0.0475)	(0.0177)	(0.0263)	(0.143)	(0.0426)	(0.0552)
AVE Time Exp	-0.0116***	-0.00612**	-0.00822***	-0.00518***	-0.0164***	-0.0205***	-0.000829
	(0.00237)	(0.00239)	(0.00178)	(0.00157)	(0.00200)	(0.00232)	(0.00159)
AVE Time Imp	-0.00384***	-0.00322**	-0.00530***	-0.00713***	-0.00247	-0.0131***	0.00391
	(0.000387)	(0.00150)	(0.000457)	(0.000722)	(0.00348)	(0.000741)	(0.00270)
Public	0.0230	0.0222	0.00734	-0.0537	0.129*	0.103***	-0.0548
	(0.0410)	(0.0425)	(0.0444)	(0.0433)	(0.0656)	(0.0296)	(0.0806)
Experience	0.0361***	0.0360***	0.0350***	0.0513***	0.0181*	0.0295***	0.0550***
	(0.00581)	(0.00562)	(0.00621)	(0.00723)	(0.00909)	(0.00603)	(0.0151)
Experience Sq.	-0.00039***	-0.00038***	-0.000357**	-0.00060***	-0.000147	-0.00029**	-0.000752*
	(0.000132)	(0.000128)	(0.000136)	(0.000194)	(0.000187)	(0.000138)	(0.000393)
Years of School	0.0258***	0.0274***	0.0276***	0.0424***	0.00669	0.0138***	0.0568***
	(0.00619)	(0.00603)	(0.00680)	(0.00564)	(0.00793)	(0.00436)	(0.0127)
Trade Union	0.396***	0.392***	0.375***	0.389***	0.379**	0.371***	0.317***
	(0.0511)	(0.0500)	(0.0612)	(0.0756)	(0.136)	(0.0599)	(0.0968)
Not Cairo	-0.116**	-0.118**	-0.126***			-0.151***	-0.0490
	(0.0421)	(0.0420)	(0.0424)			(0.0500)	(0.0634)
Blue Collar	-0.136**	-0.134**	-0.161***	-0.0211	-0.295***		
	(0.0476)	(0.0482)	(0.0559)	(0.0432)	(0.0870)		
Female	-0.166	0.456		-0.302***	0.113	-0.146	-0.257
	(0.133)	(0.307)		(0.0870)	(0.343)	(0.173)	(0.165)
Fem*AVE TE		-0.0524***					
		(0.0147)					
Fem*AVE TM		-0.00445					
		(0.0113)					
Female*Tariff		-0.0331***					
		(0.00766)					
Female*NTB		0.549**					
		(0.221)					
Constant	0.301***	0.120	0.327**	-0.0568	0.678**	0.775***	-0.279
	(0.0991)	(0.104)	(0.130)	(0.100)	(0.239)	(0.0851)	(0.292)
Ind. dummies	YES	YES	YES	YES	YES	YES	YES
Observations	1176	1176	1027	777	399	824	352
R-squared	0.319	0.331	0.325	0.405	0.184	0.222	0.369

Notes: (i.) The dependent variable is the total wage coming from all the jobs. (ii.) Robust standard errors in parentheses. (iii.) ***, ** and * represent respectively statistical significance at the 1%, 5% and 10% levels.

Table 14: Robustness Check 2: Imports and Exports Shares

	All	Males	Urban	Rural	White Collar	Blue Collar
	Ln (Hr. Wage)	Ln (Hr. Wage)	Ln (Hr. Wage)	Ln (Hr. Wage)	Ln (Hr. Wage)	Ln (Hr. Wage)
Tariff	-0.00658**	-0.00635**	-0.00544	-0.0168**	-0.0182**	-0.00863**
	(0.00282)	(0.00274)	(0.00340)	(0.00586)	(0.00723)	(0.00375)
Non Tariff	0.00198	0.0141	-0.0518	0.0956	0.0615	-0.0436
	(0.115)	(0.119)	(0.142)	(0.155)	(0.213)	(0.133)
AVE Time Exp	0.00520	0.00277	0.0208	-0.0272	0.0172	-0.0252
	(0.0127)	(0.0125)	(0.0151)	(0.0205)	(0.0231)	(0.0205)
AVE Time Imp	0.00371	0.00326	-9.09e-05	0.0117**	0.00742	0.00638
	(0.00381)	(0.00342)	(0.00401)	(0.00492)	(0.00949)	(0.00403)
Public	0.00621	-0.000708	-0.0311	0.0594	-0.0304	0.0657
	(0.0413)	(0.0442)	(0.0434)	(0.0548)	(0.0797)	(0.0390)
Experience	0.0363***	0.0357***	0.0508***	0.0200**	0.0551***	0.0298***
	(0.00541)	(0.00616)	(0.00703)	(0.00835)	(0.0145)	(0.00611)
Experience Sq.	-0.000377***	-0.000369**	-0.000586***	-0.000182	-0.000758*	-0.000284*
	(0.000126)	(0.000138)	(0.000189)	(0.000169)	(0.000374)	(0.000140)
Years of Schooling	0.0283***	0.0284***	0.0424***	0.00772	0.0585***	0.0150***
	(0.00609)	(0.00663)	(0.00559)	(0.00772)	(0.0132)	(0.00439)
Trade Union	0.395***	0.376***	0.393***	0.331**	0.315***	0.360***
	(0.0477)	(0.0610)	(0.0726)	(0.132)	(0.0956)	(0.0544)
Exp. Share	1.378***	1.339***	1.676***	0.646	1.889***	0.845**
	(0.338)	(0.275)	(0.352)	(0.521)	(0.390)	(0.343)
Imp. Share	0.0712**	0.0728***	0.128***	-0.0499	-0.0437	0.0570
	(0.0259)	(0.0205)	(0.0210)	(0.0741)	(0.261)	(0.0417)
Exp. Sh*AVE TE	-0.0931**	-0.0710	-0.190***	0.0969	-0.154	3.08e-05
	(0.0402)	(0.0424)	(0.0525)	(0.0688)	(0.102)	(0.0776)
Imp. Sh* NTB	0.0116	0.0201	-0.173	0.396	-0.0716	0.430
	(0.221)	(0.222)	(0.264)	(0.348)	(0.519)	(0.354)
Imp. Sh* AVE TM	0.000687	0.00198	-0.00537*	0.00299	5.26e-05	0.00648
	(0.00332)	(0.00320)	(0.00300)	(0.0126)	(0.0199)	(0.00964)
Imp. Sh*Tariff	-0.0105**	-0.0107***	-0.0195***	0.00973	-0.00151	-0.0107
	(0.00427)	(0.00366)	(0.00357)	(0.0137)	(0.00480)	(0.00855)
Blue Collar	-0.150***	-0.176***	-0.0611	-0.280***		
	(0.0402)	(0.0471)	(0.0378)	(0.0844)		
Not Cairo	-0.132***	-0.136***			-0.0818	-0.140***
	(0.0444)	(0.0443)			(0.0637)	(0.0473)
Female	0.349		-0.300***	0.101	-0.245	-0.142
	(0.364)		(0.0863)	(0.333)	(0.163)	(0.171)
Female*AVE TE	-0.0471**					
	(0.0165)					
Female*AVE TM	-0.00266					
	(0.0116)					
Female*Tariff	-0.0302***					
	(0.00850)					
Female*NTB	0.576**					
	(0.235)					
Constant	0.0571	0.0837	-0.264	0.375	-0.464	0.214
	(0.202)	(0.207)	(0.178)	(0.261)	(0.340)	(0.165)
Industry dummies	NO	NO	NO	NO	NO	NO
Observations	1176	1026	777	399	352	824
R-squared	0.318	0.315	0.389	0.165	0.344	0.206

Notes: (i.)Robust standard errors in parentheses. (ii.) ***, ** and * represent respectively statistical significance at the 1%, 5% and 10% levels.

Table 15: Robustness Check 3: by Education Level

	Low Educ Ln (Hr. Wage)	High Educ Ln (Hr. Wage)
Tariff	-0.0141***	-0.00362
	(0.00107)	(0.00213)
Non Tariff	-0.109**	0.150
	(0.0419)	(0.123)
AVE Time Exp	-0.0109***	-0.00862
	(0.00268)	(0.00502)
AVE Time Imp	-0.0108***	0.0174***
	(0.000748)	(0.00175)
Public	0.103***	-0.0151
	(0.0347)	(0.0933)
Experience	0.0347***	0.0481
	(0.00579)	(0.0289)
Experience Sq.	-0.000387***	-0.000464
	(0.000126)	(0.000813)
Years of Schooling	0.0206***	0.0741**
	(0.00611)	(0.0290)
Trade Union	0.325***	0.460**
	(0.0545)	(0.179)
Not Cairo	-0.0834	-0.213*
	(0.0524)	(0.102)
Female	-0.123	-0.380**
	(0.151)	(0.144)
Industry dummies	YES	YES
Constant	0.513***	-0.861
	(0.0970)	(0.652)
Observations	974	202
R-squared	0.246	0.443

Notes: (i.)Robust standard errors in parentheses. (ii.) ***, ** and * represent respectively statistical significance at the 1%, 5% and 10% levels