# INTERNATIONAL TRADE AND GENDER WAGE GAP: A DISTRIBUTIONAL ANALYSIS FOR TURKEY

**Nursel Aydiner-Avsar**

**University of Utah**

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## Abstract

This is the first study for Turkey to analyze how trade openness affects the gender wage gap along the wage distribution in Turkey. Trade policy affects men and women differently due to their different locations and command over resources in the economy. Contrary to the predictions of mainstream trade theory and Becker's theory of discrimination, feminist economists have argued that increased trade openness is unlikely to reduce the gender wage gap in developing countries or employers prejudice and gender wage discrimination. Feminist trade theorists argue that women are a source of competitive advantage for producers in labor-intensive sectors because of the uneven balance of power between men and women in both households and labor markets. Increased trade openness would widen gender wage differentials by increasing capital mobility and reducing the bargaining power of women more since women have fewer fall-back options in comparison to men. Moreover, women are segregated into a narrow range of occupations and industries, which help enhance the competitive advantage of firms due to women's restricted bargaining power. Based on this theoretical framework, this study examines the effect of increased trade openness on the gender wage gap and wage discrimination in Turkey using two empirical methodologies. The first is a quantile regression decomposition analysis to study how the gender wage gap and its discriminatory component differ between tradable and non-tradable sectors across the wage distribution. In the second step, two-stage regression analysis allows examination of how the residual gender gap, which is commonly used in the literature as a proxy for gender wage discrimination, is affected by trade openness measures in the manufacturing sector. The study uses individual level Household Labor Force Survey data for 2006 and trade statistics. Confirming the feminist analyses for other countries, there is a larger gender wage gap in tradable sectors in comparison to non-tradable sectors, which is mainly attributable to the unexplained (discriminatory) component of the wage gap.

## 1. INTRODUCTION

The impact of export-oriented growth strategies on gendered labor market outcomes has been on the agenda of feminist economics for a long time. Studies mainly focusing on the employment dimension showed that there is a feminization of employment in many countries during the export-oriented growth strategy era (Guy Standing, 1989; Çagatay and Günseli Berik 1990; Susan P. Joekes 1995; Sharon Stichter 1990; Sule Ozler 2000). However, relatively few studies looked at the issue of the gendered wage implications of increased trade openness mainly due to data limitations. Although the determinants of the gender wage gap in general have been studied for Turkey as will be discussed later, the implications of trade openness for the gender wage gap have not been the focus of earlier studies. This study will provide evidence on how trade openness affects the gender wage gap using both decomposition and regression-based methodologies. It also extends the discussion on international trade and the gender wage gap by going beyond the mean wage gap and discussing the different dynamics among low wage and high wage workers.

The contributions of this essay are twofold. First, I extend the discussion on trade and the gender wage gap to a distributional dimension by studying the whole wage distribution. Earlier studies mainly focused on how trade affects the average gender wage gap without investigating the differences across the wage distribution. This study also introduces a novel application of quantile regression decomposition analysis to answer a trade openness related question. Moreover, being a middle-income developing country, Turkey is an interesting case to study with broader implications for other countries at a similar stage of development. This study will add a new country case study to the relatively scarce literature on international trade and gender wage gap in developing countries. Second, this represents a contribution to the literature on Turkey. Studies on the gender wage gap in Turkey have not looked at the implications of trade openness for women's relative wage position before. This study is an attempt to close this gap in the literature on Turkey. Although Ilkkaracan and Selim (2007) provides a detailed analysis of the gender wage gap using data for 1994 and Susanli (2009) provides a more recent and distributional analysis of the gender wage gap in Turkey, none of these studies look at the issue of how gender wage gap differs across the distribution in open vs. closed sectors. Therefore, my study aims to shed light to the trade openness dimension in understanding the forces shaping the gender wage gap in Turkey. The second stage of the empirical analysis, based on a two-stage regression analysis, will provide a deeper understanding by studying how the residual gender gap is affected by regional variations in trade

openness in the manufacturing sector. The final draft will include the results from the two-stage regressions analysis, which is still in progress.

The paper is structured as follows. After this short introduction, Section 2 presents the theoretical framework regarding the impact of trade openness on the gender wage gap while Section 3 presents the empirical strategy. Section 4 presents the data and the descriptive statistics, Section 5 presents the empirical results and Section 6 concludes the paper.

## 2. THEORETICAL FRAMEWORK AND REVIEW OF THE EMPIRICAL LITERATURE

Although mainstream trade theory based on the H-O-S framework does not draw a direct relationship between trade flows and gender, its predictions have implications for gendered wage outcomes. According to H-O-S theorem, trade liberalization leads to an increase in relative returns to low-skilled labor in developing countries. Since unskilled labor constitute the main asset of women and women are more concentrated in unskilled jobs in comparison to men, mainstream trade theory predicts that trade liberalization would contribute to reducing gender inequality in developing countries (Diane Elson et al., 2007) [1]. The expectations of mainstream trade theory depend on various strict assumptions which may not hold in many cases (Davis and Mishra, 2007). Moreover, other factors independent of or induced by trade openness would also lead to an opposite outcome in which returns to skilled labor (mostly men) increase relative to unskilled labor (mostly women). Those factors include trade-induced skill-biased technological change, global production sharing as well as the shift in the comparative advantage of semi-industrialized countries towards more skill-intensive production after the entry of low wage countries especially China.

Heterodox economists, on the other hand, develop a more fundamental critique of the H-O-S model based on the view that production in a capitalist economy is an inherently monetary process and that unemployment and excess capacity are inherent characteristics of an economy rather than being transitory features. They argue that an initial trade imbalance will affect interest rates and income, not relative prices. In this framework, it is the differences in the money cost of production, thus the absolute advantage of countries governed by technology gaps, wage gaps and demand gaps

[1] Although it is beyond the scope of this essay, mainstream theory argues that trade openness also reduces gender wage disparities through the dynamic growth link if trade openness spurs economic growth which would make public services more available and help reduce gender disparities in education and other skill related attributes (World Bank, 2001). The empirical literature on the link between trade liberalization and economic growth usually relies on cross-country analysis and has been under intense criticism (Rodriguez and Rodrik, 2000). Thus this dynamic link and the resulting positive expectations have been criticized on both theoretical and empirical grounds.

that set the relative position of countries as opposed to the comparative advantage perspective of the mainstream trade theory (Diane Elson et al., 2007). Thus, countries' competitive advantage driven by differences in money cost of production shape the patterns of trade, and factor prices are shaped by these patterns and the institutional structure in place not by the relative endowments.

Besides the implications of H-O-S theorem for gender wage inequality, mainstream theorists points at another channel through which international trade is expected to reduce gender wage inequality. This framework depends on Gary Becker (1971)'s influential work on the economics of discrimination. Accordingly, increased competition in the product market reduces discrimination in the labor market as discrimination becomes more costly for employers. In that framework, employers' "taste" for discrimination is reduced by higher competition since a firm must forego profits to practice discrimination. Extending Gary Becker's theory (1971) on the economics of discrimination in the context of international trade, Bhagwati (2004) argues that trade openness will put pressure on domestic firms to abandon their prejudice against women since this prejudice increases their costs creating a disadvantage for them vis-à-vis foreign firms.

Heterodox trade theory focuses on the competitive advantage and the sources of competitive advantage in understanding the gendered implications of trade[2]. Feminist theorists emphasize that women are a source of competitive advantage for producers in labor-intensive sectors because of the uneven balance of power between men and women in both households and labor markets (Diane Elson et al., 2007). In contrast to the positive expectations based on Becker's theory of discrimination, crowding of women in a narrow range of occupations and industries would intensify discrimination that women are exposed to in the labor market. Especially segregation of women in relatively few industries which lead to oversupply or crowding of labor in those industries; segregation of women in less-capital intensives sectors with low productivity; a higher degree of concentration for men in comparison to women in efficiency wage paying industries or occupations are particularly important in the persistence of gender wage differentials (Stephanie Seguino, 1997).

Increased capital mobility also affects men and women differently as women have a restricted bargaining power and fewer fall-back options in comparison to men[3]. Because of women's restricted bargaining power, job segregation would enhance the competitive advantage of firms by reducing their money costs (Barbara Bergmann 1974; Stephanie Seguino 2000). High gender wage gaps would also promote the expansion of exports of labor-intensive products (Matthias Busse and

[2] See Irene van Staveren, Diane Elson, Caren Grown, and Nilufer Cagatay (2007) for a volume of articles on the feminist economics of trade.
[3] See Stephanie Seguino (2000) for evidence on Taiwan.

Christian Spielmann, 2006). This process may be enhanced by employer and government-sanctioned discrimination against women justifying women's concentration in low-skill, low-paying and high turnover jobs (Diane Elson, 1995; Stephanie Seguino, 1997; Gunseli Berik, 2000).

Besides their critique of the gender implications of the H-O-S framework, heterodox economists also criticize Gary Becker's (1971) theory of discrimination. They argue that persistent discrimination could be quite consistent with a competitive market structure based on a different interpretation of competition. In this framework, competition is interpreted as a tendency towards uniform rates of profit through the mobility of finance, and neither barriers or rigidities, nor number of producers in a given product market come into play (William Darity and Rhonda Williams, 1985). Competition gives rise to monopolies as winners consolidate and concentrate, excluding the losers. The same logic applies to labor markets where certain groups could insulate themselves from the rest (William Darity and Rhonda Williams, 1985; Rhonda Williams, 1987). Men could preserve their advantageous positions through their control on job definition, training or other job-related attributes and concentrating in those positions while leaving women with lower-paying and lower status jobs. Thus gender wage discrimination could persist under increased openness and benefit producers by providing a cost advantage to them.

While the impact of trade liberalization on gendered employment patterns have been discussed to a greater extent, studies on its gendered wage implications are relatively new. The most commonly adopted empirical methodology in country case studies is the two-stage approach. One estimates the residual gender wage gap, the most commonly used proxy for the discriminatory component, in the first stage. Then this industry-level measure of discrimination is regressed on various industry-level trade openness measures in the second stage. The key challenge in this type of analysis is isolating the impact of foreign competition from other factors that are unrelated to participation in international markets. Various studies adopted the empirical strategy of comparing the impact of trade openness on the residual gender wage gap in more concentrated industries to its impact in less concentrated industries based on the logic that the change in product market competition in more concentrated industries would mainly result from foreign trade. This methodology was first adopted by Sandra Black and Elizabeth Brainerd (2004). They empirically test the hypothesis that international trade would reduce the rents available in a sector that were enjoyed by men to a greater extent thus reduce gender wage discrimination as discrimination

becomes more costly, and find supporting evidence for the US. However, their findings and interpretation are criticized by Ebru Kongar (2007)[4].

The same empirical strategy has been applied to various developing country cases. Raquel Artecona and Wendy Cunningham (2002) also find a negative but statistically insignificant effect of increased foreign competition on the residual wage gap in the concentrated industries of Mexico. In contrast to the findings of Sandra Black and Elizabeth Brainerd (2004) that is consistent with the mainstream theory, Gunseli Berik et al. (2004) finds empirical evidence showing that foreign competition in concentrated industries has a positive impact on gender wage discrimination in the cases of S. Korea and Taiwan adopting the two-stage approach. In a recent study, Nidhiya Menon and Yana van Der Meulen Rodgers (2009) find empirical evidence that increased trade openness is associated with a larger residual gender wage gap in the concentrated manufacturing sectors of India[5]. On the other hand, Barry Reilly and Puja Dutta (2005) also studies the impact of trade liberalization on the gender wage gap in India using a two-stage approach but without focusing on the impact of trade in concentrated industries. They find a negative but relatively modest effect of a decline in tariff rates on the gender wage gap[6] [7]. Gautam Hazarika and Rafael Otero (2004) study the gender wage gap across maquiladora and non-maquiladora industries in Mexico. They find that the gender wage gap worsened over time in the maquiladora industry while it improved in the non-maquiladora industry[8].

There are also country case studies on trade and gender wage gap using macro data. Gunseli Berik (2000) is one of the first studies studying the impact of trade, capital flows and technological change on gender wage inequality using industry-level macro data. She finds that greater export orientation negatively affects both men and women although the gender wage inequality declines

[4] Ebru Kongar (2007) argues that it is not the decline in discriminatory wage differentials resulting from increased foreign competition but the disproportionate loss of employment for low-wage workers, which in turn increased the wages for the remaining female workers, that explains the decline in the gender wage gap in the United States over the last decades More specifically, she criticizes their findings arguing that Black and Brainerd (2004) interpret the residual gender wage gap as capturing gender differences in unobservable skills in competitive markets while as capturing discriminatory practices in concentrated industries.

[5] While both Gunseli Berik et al. (2004) and Nidhiya Menon and Yana van Der Meulen Rodgers (2009) use a similar methodology with Black and Brainerd (2004), they additionally introduce continuous measures of industrial concentration for robustness checks besides using a dummy variable for concentrated industries determined based on a certain criterion.

[6] Using trade shares, they find a positive and statistically significant impact of export share on gender wage gap while the impact of import share is negative and statistically significant as well. They employ a set of industry specific controls such as the share of casual workers, industry feminization rate, the share of skilled workers in the industry, a union density rate, the share of blue-collar workers in the industry, and industry policy measures.

[7] I follow a similar approach to Barry Reilly and Puja Dutta (2005) using region-level variations in gender wage discrimination and trade openness due to lack of data for the sub-sectors of manufacturing.

[8] However the gender wage gap is still lower in the maquiladora industries than it is in the non- maquiladora industries.

because of the higher penalty that male workers face. Findings of this study highlights the importance of not only studying the gender wage gap in closed vs. open sectors but also looking at the relative position of men and women in closed vs. open sectors which will be addressed in the empirical analysis section.

While most of the studies on this issue are country-specific analysis, cross-country studies try to come up with generalized findings. In a recent cross-country analysis, Remco Oostendorp (2009) studies the relationship between the occupational gender gap defined in four digit occupation categories and GDP per capita and its square, to check for the effect of development[9]; as well as measures of globalization defined as trade as a share of GDP and FDI net inflows as a percentage of GDP, distinguishing between high-income and low-income countries and high-skill and low-skill occupation groups in the regression analysis. He finds a negative impact of trade on the gender wage gap for low and high-skill occupations in richer countries while this impact is insignificant in poorer countries. FDI turns out to have an insignificant effect on low-skill occupations as well. He links this non-existence of a significant impact of trade and FDI on the gender wage gap in poor countries to the conjecture that further economic growth help close gender gaps only after reaching a certain development threshold *ala* Boserup (1970). However, it is not clear how this Kuznets-type relationship fit in the framework of mainstream trade theory that would expect a decline in gender wage gap as poor countries shift towards low-skill-intensive sectors that heavily employ women.

While all of the studies reviewed so far use regression analysis, there is only one study that adopt the wage decomposition analysis in studying the implications of trade openness for the gender wage gap. Fatma El-Hamidi (2008) studies gender wage gap in tradable and non-tradable sectors in 1998 and 2006 for the Egyptian labor market[10]. While there is a larger wage gap in non-tradable sectors than there is in tradable sectors in 1998, the gender wage gap widens in tradable sectors between 1998 and 2006 as opposed to the narrowing down observed in non-tradable sectors. In 2006, the tradable sector gender wage gap gets significantly above the gender wage gap in the non-tradable sectors. Using standard Oaxaca-Blinder decomposition, she finds that the unexplained component of the gender wage gap increases in tradable sectors while it declines in non-tradable sectors between 1998 and 2006. She also extends the analysis introducing across and within sectoral

[9] He finds a non-linear inverted U-type relationship with a positive effect of GDP per capita on the gender wage gap in poor countries and a negative effect in rich countries. However the negative effect observed in poor countries is not robust to the use of IV technique to account for potential endogeneity.

[10] She focuses on the non-agricultural, private segment of the labor market considering manufacturing and tourism as tradable sectors and the rest of the sectors as non-tradable.

wage differences, thus comparing average male workers with average female workers within and across economic sectors. The results show that the observed wage gap is mainly due to intra-sectoral differences in wages (which she refers as pure discrimination); wage discrimination increases in both sectors; and intra-sectoral wage gap that is unexplained by workers' productive characteristics is found to be higher in non-tradable sectors in comparison to tradable sectors.

While Fatma El-Hamidi (2008) studies gender wage gap across open and closed sectors in Egypt, William Horrace et al. (2006) studies gender wage gaps across knowledge-based[11] manufacturing, knowledge-based services, other manufacturing and other services in S. Korea adopting a modified version of the Oaxaca-Blinder decomposition methodology. They find that knowledge-based industries have lower discrimination than non-knowledge-based industries with a more pronounced impact in manufacturing; and services have lower discrimination than manufacturing. They conclude that gender discrimination is likely to be larger in sectors that require physical power where women have a disadvantage.

While most of the earlier studies focused on the mean gender wage gap, the recent literature on gender wage gap has moved beyond the mean gender wage gap, studying the gender wage gap along the entire wage distribution based on the expectation that gender wage gap might be different among low wage and high wage workers. While a "glass ceiling" effect refers to a significantly greater earnings gap at the upper tail of the distribution, a "sticky floor" effect refers to the case where the wage gap is much higher at the lower tail thus low wage women are at a more disadvantageous position. Although there is a growing empirical literature regarding the presence of a glass ceiling vs. sticky floor in many county case studies including Turkey (e.g. Ganguli and Katherine Terrell 2008, Bilgen Susanli 2009, Christophe Normand and Francois Wolff 2009, James Albrecht 2003 among others), no previous study studied the gender wage gap in relation to trade openness across the entire distribution[12].

There are only a few studies that study the extent and the causes of the gender wage gap in Turkey. The female-male raw wage ratio differs significantly across years and depending on the source of data. Meltem Dayioglu and Kasnakoglu (1997) report a ratio of 96 percent using the 1987 Household Income and Expenditure Survey while Dayioglu and Insan Tunali (2004) reports a raw gender wage ratio of 98 percent using the 1988 Household Labor Force Survey. For the year 1994, Aysit Tansel (2005) reports a ratio of 77 percent in the private sector and 84 percent in the public

[11] The term "knowledge-based" refers to the extent which industries produce or employ high-technology products.
[12] Many of the studies on the glass ceiling vs. sticky floor effect make the public-private sector distinction. Since our focus is on the influence of trade openness, we only study the private sector.

sector using the Household Income Distribution and Expenditure Survey. On the other hand, Meltem Dayioglu and Insan Tunali (2004) report a ratio of 85 percent for the same year. The most recent studies on the gender wage gap in Turkey are undertaken by Ipek Ilkkaracan and Raziye Selim (2007) and Bilgen Susanli (2009). Ipek Ilkkaracan and Raziye Selim (2007) use the 1994 Workplace and Employment Structure Survey and report a 71 percent female-male wage ratio. They find that 43 percent of the wage gap remains unexplained in the basic model and the unexplained portion drops to 22 percent when one controls for workplace related factors highlighting the importance of occupational and industrial gender segregation as well as gender differences in other labor market affiliations such as the size of the firm or the collective bargaining status.

Following this brief overview of the theoretical and empirical arguments, we aim to answer the following questions in the empirical analysis:

1. How does gender wage gap differ across tradable and non-tradable sectors in Turkey?
2. Is there a glass ceiling, a sticky floor or both in tradable and non-tradable sectors in Turkey? How high is the glass ceiling or how low is the sticky floor?
3. How does regional variation in trade openness affect the residual gender wage gap in the manufacturing sector in Turkey?

Based on the Feminist trade theory, one would expect that gender wage gap may increase in response to trade openness as female workers are crowded into low-skill, low-paying jobs due to their relatively low bargaining power in the labor market. Also competition would derive concentration and gender wage discrimination would persist even under increased foreign competition. On the other hand, mainstream theory would expect a lower gap in the tradable sectors of the economy.

## 3. EMPIRICAL STRATEGY

In the first stage of the analysis, we adopt a decomposition technique to answer the first tqo questions outlined above. There are alternative methodologies proposed to decompose the changes in the entire wage distribution. One such method was proposed by Dinardo, Fortin and Lemieux (1996) [DFL96] based on a semi-parametric weighted kernel methodology. They decompose the changes in wage density only into endowment or covariate effect and the remaining part is referred to as unexplained. Juhn, Murphy and Pierce (1993) also proposes a way of decomposing the

changes in wage density however their model is based on the assumption of homoskedascitiy and a single linear model that holds for the whole wage distribution. A more recent technique to decompose the changes in wage distribution is proposed by Machado and Mata (2005) [MM05 from here on] and later extended by Autor et al. (2005) and Melly (2005, 2006) [Melly06 from here on]. This approach is based on the extension of the famous Oaxaca (1973) and Blinder (1973) [OB from here on] decomposition of the mean of a distribution to the entire wage distribution through the use of quantile regression technique. MM05 enables one to decompose the differences in wage densities between two groups into both endowment/covariate and price/coefficient effects. Moreover, quantile regression technique accounts for heteroskedasticity. The MM05 methodology nests most of the earlier approaches as also highlighted by Autor et al. (2005). Due to these advantages, we use the quantile decomposition technique in our analysis.

The OB decomposition can be presented as follows where the first term refers to the characteristics effect and the second term refers to the coefficients effect.

$$\bar{W}_1 - \bar{W}_0 = (\bar{X}_1 - \bar{X}_0)\hat{\beta}_1 + (\hat{\beta}_1 - \hat{\beta}_0)\bar{X}_0 \qquad (1)$$

While the characteristics effect reflects differences in endowments in explaining the wage gap between the reference group and the treatment group, the coefficients effect reflects merely the differences in returns to the same characteristics, which is also referred to as discrimination in gender/race wage gap analysis. While the OB methodology is useful to analyze the factors determining the average wage gap between two groups, it doesn't provide any information regarding the whole distribution. Therefore, quantile regression (QR) decomposition technique provides a deeper analysis of the gender wage gap. Jose Machado and Jose Mata (2005) was the first study that extends the OB decomposition to QR framework. They generate the counterfactual distribution if women would have been paid according men's characteristics (assumed to be the competitive structure as conventional in the gender wage gap literature) based on a simulation technique. A similar approach is proposed by Blaise Melly (2006), which we adopt in our analysis.

Once one gets the counterfactual distribution that would have prevailed if women were paid according to the same return structure prevailing for male workers, then the decomposition would be written as follows for each quantile[13]:

[13] Albrecht (2009) finds that the results based on MM05 with asymptotic standard errors as derived in Albrecht et al. (2009) and the ones based on Melly06 with bootstrapped standard errors are essentially identical.

$$\hat{q}_W(\theta) - \hat{q}_M(\theta) = \hat{q}_1(X_i^W;\beta^W;\theta) - \hat{q}_0(X_i^M;\beta^M;\theta) + \hat{q}_c(X_i^W;\beta^M;\theta) - \hat{q}_c(X_i^W;\beta^M;\theta)$$

$$\hat{q}_W(\theta) - \hat{q}_M(\theta) = \underbrace{\left[\hat{q}_1(X_i^W;\beta^W;\theta) - \hat{q}_c(X_i^M;\beta^W;\theta)\right]}_{\text{Covariate effect}} + \underbrace{\left[\hat{q}_c(X_i^M;\beta^W;\theta) - \hat{q}_0(X_i^M;\beta^M;\theta)\right]}_{\text{Coefficient effect}} \quad (2)$$

We estimate standard wage regressions in our analysis. Our dependent variable is the natural logarithm of hourly wage. Wages represent the monthly cash income from the main occupation for those who listed their labor force status as wage and salary earners[14]. Wage data includes monthly payments of bonus and premiums. Hourly wage is equal to monthly wage divided by four times the regular weekly hours of work[15]. We estimate two alternative specifications of the wage regression, namely the basic and the expanded specifications. The basic specification is used to set an upper bound for gender discrimination and the expanded one is introduced to set a lower bound for gender discrimination[16].

We first estimate the basic wage regression in which log hourly wage is a function of age defined as dummies for age categories ranging from 20-24 to 60-64 where the age category of 15-19 is considered as the base group; tenure and its square in the current job to account for firm-specific experience; education level introduced as dummies for non-graduate but literate, primary school, secondary school, regular high school, technical high school and college or more while illiterates are considered as the base group; gender dummy for female workers to measure the gender wage gap; marriage dummy to measure the marriage wage gap; an urban dummy and eleven region dummies with Istanbul being the base category to control for regional differences that might affect the wage setting process:

$$\ln(\text{wage})_i = \beta_0 + \sum_{i=1}^{9}\beta_i \text{age}_i + \beta_{10}\text{tenure}_i + \beta_{11}\text{tenure}_i^2 + \sum_{i=12}^{17}\beta_i \text{educ}_i + \beta_{18}\text{female}_i + \beta_{19}\text{married}_i$$
$$+\beta_{20}\text{urban}_i + \sum_{i=21}^{31}\beta_i \text{region}_i \quad (3)$$

We then expand the basic model with a series of other individual and workplace related variables including eight occupation dummies with legislators and managers being the base category; a

[14] Wage data is also presented for casual workers however we exclude them since they don't have a regular flow of income unlike wage and salary earners.

[15] Both regular and actual weekly hours of work are reported. However hourly wages calculated using regular and actual hours are quite close to each other.

[16] Exclusion of controls such as industry and occupation is based on the idea that employers' discriminatory practices could be highly correlated with occupation and industry categories (Arrulampalam et al., 2007). On the other hand, exclusion of these factors might lead to an overestimation of the gender wage gap as also evidenced by Ilkkaracan and Selim (2007) for the Turkish case based on Oaxaca-Blinder decompositions for the manufacturing sector in 1994.

dummy for social security coverage; five firm size dummies with workplaces employing less than 10 workers being the base category and two sector dummies for the tradable group (five dummies for the non-tradable group). While agriculture is the base category in the tradable group wage regressions; electricity, gas and water is the base category in the non-tradable group wage regressions:

$$\ln(\text{wage})_i = \beta_0 + \sum_{i=1}^{9}\beta_i \text{age}_i + \beta_{10}\text{tenure}_i + \beta_{11}\text{tenure}_i^2 + \sum_{i=12}^{17}\beta_i \text{educ}_i + \beta_{18}\text{female}_i + \beta_{19}\text{married}_i$$
$$+\beta_{20}\text{urban}_i + \sum_{i=21}^{31}\beta_i \text{region}_i + \sum_{i=32}^{39}\beta_i \text{occup}_i + \beta_{40}\text{soc.sec}_i + \sum_{i=41}^{45}\beta_i \text{fsize}_i + \sum_{i=46}^{(48 or 50)}\beta_i \text{sector}_i \quad (4)$$

We analyze the gender wage gap through the female dummy in each sector group by estimating both the basic and the expanded wage regressions (equation 3 and 4 respectively). In the second stage of the empirical analysis, we extend the wage regression in equation (4) with region-level measures of trade openness and other manufacturing industry related variables to study how gender wage discrimination, measured as the residual gender gap is affected by trade openness. The results for that part of the analysis are not presented in this current draft but will be included in the final draft.

## 4. DATA AND DESCRIPTIVE STATISTICS

We use the Household Labor Force Survey data for 2006 in our analysis. We focus on the private segment of the labor market[17]. We restrict our sample to wage and salary earners, who are between the ages of 15 and 65 and earning a positive monthly wage income, excluding casual workers who don't have proper flow of wage income. These restrictions leave us with 46,484 observations. Besides this base sample, we also undertake our analysis using an alternative sample where we further restrict our sample to those that work for at least 30 hours a week and earn a minimum monthly wage income of 100 TL to get rid of outliers[18]. Our second sample, the restricted sample, consists of 45,754 observations. Table 1 presents the descriptive statistics for average

[17] Although interesting, public sector has a very different wage setting dynamic in Turkey and therefore is excluded from our working sample to avoid potential bias that might result from the inclusion of public sector workers. Public sector is usually known to be more egalitarian in terms of gender wage differentials in comparison to private sector. Since our objective is to capture the differences in gender wage gap with respect to the openness status of sectors, we solely focus on the private sector of the economy. Public sector constitutes 30.25% of the overall economy, 41.87% of the non-tradable sectors and 5.64% of the tradable sectors.

[18] The reason behind setting these limits is that, though a few, there are observations that earn near to zero income while working for at least 30 hours a week. This way we aim to alleviate the bias that might result from misreporting of data. We discuss our results for both samples in the empirical results part.

monthly wage, log monthly wage and log hourly wage for total workers, male workers and female workers in the total private, tradable private and non-tradable private sectors respectively based on the unrestricted sample.

[Insert Table 1 here]

While the average monthly wage is 618 TL in the non-tradable sector, it is 587 TL in the tradable sector. A much higher gap between tradable and non-tradable sectors exists for women with women in tradable sector earning 591 TL on average while women in tradable sector earn 502 TL on average. The same figures are 626 TL and 606 TL for men respectively. However, once one takes into account hours of work per week, these figures point at an opposite outcome for total workers and male workers while the wage advantage of non-tradable sector workers vis-à-vis tradable sector still continues for women as can be seen in log hourly wage figures. Indeed these results show that studies relying on annual or monthly figures might be misleading due to the divergence in weekly hours of work in the labor force and the resulting need for correcting for the effect of hours of work. When one looks at the hourly wage figures across the quantiles, it turns out that only workers at the very high end of the distribution ($90^{th}$ percentile) earn more in non-tradable sectors than they do in tradable sectors. This is also valid for men. However, women start enjoying higher wages in non-tradable sectors relative to tradable ones at both the middle and the upper end of the distribution.

The relatively advantageous wage position of women in non-tradable sectors also show itself in the raw gender wage gap figures across tradable and non-tradable sectors. While the ratio of average monthly wage of women to that of men is 83% in tradable sectors, it is 94% in non-tradable sectors. The figures for non-tradable sectors are quite distinctive reflecting, to some extent, the relatively high education level of female workers working in non-tradable sectors. Studying the gender wage gap across sector lines is fruitful due to the significant discrepancies across sectors. There are also differences in terms of the distribution of worker characteristics across tradable and non-tradable sectors. Table 2 presents the descriptive statistics for worker characteristics by gender in the total private, tradable private and non-tradable private sectors respectively.

[Insert Table 2 here]

While women are younger than men in both sectors, women in tradable sectors are younger than women in non-tradable sectors. Another demographic characteristic that is influential in

women's labor force participation rate is marital status. While the majority of wage-salary earning women are single, working men are mostly married reflecting the gender roles that are in place in the society. The role of education in women's labor force participation also shows itself in the educational composition of wage earners with women being more educated than men in general. The difference is particularly striking in the non-tradable sector where more than one fourth of women hold a college degree while the same figure is 12% for men.

There are both sectoral and gender differences along firm size as well. While non-tradable sector employment concentrates mostly in small establishments, tradable sector employment is more spread across different firm size categories. Although the difference is small, women tend to work more in large firms in comparison to men.

Occupational composition does not differ much between men and women in tradable sector with a few exceptions. Within blue collar jobs, women are represented more in elementary positions and less in higher skill requiring blue collar jobs. In terms of white collar jobs, they are overrepresented in clerk and technician/associate professional jobs. Although the trends are similar, these discrepancies are much larger in non-tradable sectors with women dominating clerk and professional positions relative to men. Geographic and rural-urban distribution does not differ much by gender and sector except for women in tradable sectors where 41% of women reside in Istanbul area while the same figure is 33% for men.

Finally we present the Kernel wage densities by gender and sector categories. Figure 1 presents the wage densities across tradable vs. non-tradable groups and men vs. women respectively. Workers in tradable sectors have a larger mass in the middle of the distribution while there are more non-tradable sector workers at the lower tail of the distribution. On the other hand, male-female wage distributions differ mainly at the upper tail of the distribution with more men holding high wage paying jobs. Women also have a larger mess at the lower tail of the wage distribution in comparison to men. Figure 2 presents the male-female wage distributions in each respective sector group. There is a larger difference between the male and the female wage distribution in tradable sectors than there is in non-tradable sectors. Men have a significant mass at the upper tail of the distribution in tradable sectors while it is women that have a larger mass, even small, at the upper tail of the distribution in non-tradable sectors. Interestingly women also have a relatively larger mass at the lower tail of the non-tradable sector distribution. On the other hand, women mainly concentrate in the lower tail and middle of the tradable sector distribution. Thus

descriptive statistics show that women are at a more disadvantageous position in tradable sectors than they are in non-tradable sectors. In the next section, we study the underlying reasons behind these trends using decomposition analysis. We also correct for sample selection to see if our conclusions are robust to sample selection correction.

[Insert Figures 1 and 2 here]

## 5. EMPIRICAL RESULTS

In this section, we present the results on the decomposition of the gender wage gap in tradable and non-tradable sectors respectively. In order the capture the variation across the distribution we present quantile decomposition results using Melly (2006) as well as the traditional Oaxaca-Blinder decomposition based on the mean of the male and the female wage distributions. Table 3 presents the explained and the unexplained portions of the total gender wage differential in tradable and non-tradable sectors respectively based on the Oaxaca-Blinder estimation. While there is a positive raw wage gap in favor of men in tradable sectors, interestingly we find a negative raw wage gap in non-tradable sectors implying that women earn more than men on average. Using the restricted and the unrestricted samples do not change the implications of our results in a significant way except for a few differences. First there is a decline in the size of the gap when we exclude very low wage earners and those working for less than 30 hours a week. Second, while the unexplained component of the gender wage gap also declines in tradable sectors, there is an increase in the size of the unexplained component in non-tradable sectors and especially when we use the expanded specifications. Here we discuss only the results based on the unrestricted sample. As also discussed above, we estimate the basic specification (equation 3) to set a lower bound and the expanded specification (equation 4) to set an upper bound and to check for the endogeneity of occupation and industry thus the influence of segregation of women into certain sectors, occupations and firm size categories on the gender wage gap.

There is a 14.6 log point difference between the wages of men and women in tradable sectors without the sector, occupation and other workplace-related controls. 12.7 points of this difference (87.2%) is due to the unexplained component which represents different returns to similar characteristics across gender groups and is interpreted as the effect of discrimination[19]. When we add the additional controls, the raw gap turns out to be fully attributable to the unexplained

[19] This shouldn't mean that the explained component is purely free of discrimination as women are usually subject to discrimination before entering the labor market which directly affects their characteristics.

component. On the other hand, there is a 4.6 log point wage gap in favor of women in the non-tradable sector which is mostly explained by the explained component. This implies that women earn more than men on average thanks to the better characteristics they hold and despite the discrimination that they are exposed to. Thus the positive characteristics effect outweighs the negative coefficients effect thus the impact of discrimination against women. More specifically the explained component leads to a difference of 9.9 log points in favor of women while the unexplained or the discriminatory component leads to a difference of 5.4 log points in favor of men. Overall, this results in the 4.6 log points of difference in favor of women.

When we compare the unexplained or the discriminatory component across tradable and non-tradable sectors, we find that women are exposed to a significantly larger discrimination in tradable sectors than they are in non-tradable sectors. Overall we can conclude that women face more discrimination in open sectors of the economy than they do in closed sectors. They hold a wage advantage over men thanks to holding better characteristics than men in non-tradable sectors. Actually, this is not a surprising result given that women in non-tradable sectors are highly educated.

We now discuss the quantile decomposition results in the tradable sector. Figure 3 presents the decomposition results for tradable sectors based on the basic specification (equation 3) and using the unrestricted sample. The first block in Table 4 presents the numerical results for the selected quantiles of the distribution corresponding to Figures 3. While there exists a very large gap, as high as 49.8%, at the very low end of the tradable sector distribution ($1^{st}$ percentile), this gap shrinks to 11.3% at the $10^{th}$ percentile and then increases to 12.3% at the median and 19.7% at the $90^{th}$ percentile. All the raw gender wage gaps and the component of the gap attributable to the coefficient effect are significant across the wage distribution at the 5% significance level (and at the 1% significance level for most of the quantiles). However the characteristics effect is not significant at the 5% significance level for the $1^{st}$, $5^{th}$, $10^{th}$, $20^{th}$, $80^{th}$, $90^{th}$, $95^{th}$ and $99^{th}$ percentiles. Thus the discriminatory component explains the full gender wage gap at these percentiles. On the other hand, even at the $30^{th}$-$70^{th}$ percentiles where the characteristics effect is significant, at least 80% of the gender wage gap is attributable to the coefficient effect. Overall one can conclude that differences in coefficients explain almost the entire gender wag gap across the wage distribution. If we investigate the gender wage gap at the lower and the upper end of the tradable sectors' distribution, we find that there exists both a glass ceiling (with an 8 log point difference between the $90^{th}$

percentile and the median) and a sticky floor (with a 2 log point difference between the 10th quantile and 20th and 30th quantile). However, the floor does not exist when we compare the 10th quantile with the median since the wage gap at the median is higher than the one at the 10th quantile. Overall we observe both a glass ceiling and a sticky floor in the tradable sectors although the ceiling effect is stronger than the floor effect.

The results are quite interesting when we look at the non-tradable sector (the second block in Table 4 and Figure 4). There is a significant positive wage gap in favor of women starting at the 50th percentile of the distribution which is as high as 17.1% at the 90th percentile. On the other hand, the negative wage gap that is significant at the 5th, 10th and 20th percentiles are still lower than the one observed in tradable sectors. The characteristics effect is positive across the entire wage distribution explaining the presence of a small negative wage gap at the lower tail and a positive wage gap at and above the median. Except the 1st, the 10th and the 20th percentiles, the coefficients effect thus the discriminatory component is larger in tradable sectors than they are in non-tradable sectors. They are close to each other at the 1st, the 10th and the 20th percentiles. Thus we observe both a larger gender wage gap and a larger discriminatory effect in tradable sectors in comparison to non-tradable sectors. On the other hand, women manage to have a low gender wage gap at the lower tail and even a positive wage gap at the upper tail of the distribution thanks to possessing better characteristics than men. This would mainly reflect the composition of the non-tradable female workforce who has a higher education level than men on average as also discussed in descriptive statistics. We only observe a sticky floor effect in the non-tradable sector. On the other hand, the positive wage gap that is at the advantage of women at the upper tail favors women at the higher percentiles even more. When we use the basic specification but using the restricted sample, the only change in comparison to the decompositions using the non-restricted sample is a decline in the size of the gender wage gap along the wage distribution but especially at the very low end of the distribution. Besides that, the general trends are the same with a gender wage gap that is mainly attributable to the discriminatory component[20]. Using the restricted sample slightly lowers both the negative and the positive wage gap along the non-tradable wage distribution although the trends stay the same. Both the sizes of the characteristics and the coefficients effects stay more or less the same.

[20] Decomposition tables and graphs are not presented here due to space concerns but are available upon request.

We also repeat our quantile decomposition analysis using the expanded specification to set a lower bound for gender discrimination[21]. In the tradable sectors, the raw gender wage gap stays more or less the same in comparison to the basic specification at the upper tail of the distribution while it is slightly higher between the $10^{th}$ and the $50^{th}$ percentiles. The characteristics effect is statistically insignificant at all the quantiles except for the $95^{th}$ percentile. In other words, the observed gender wage gap is solely attributable to the coefficients effect thus the discriminatory component across the tradable sector distribution. A sticky floor exists according to the $10^{th}$-$20^{th}$, the $10^{th}$-$30^{th}$ and the $10^{th}$-$40^{th}$ percentile differences that exceed the threshold of 2 log points or % points. However, it does not exist according to the $10^{th}$-$50^{th}$ percentile difference. On the other hand, there exists a glass ceiling based on the gap between the $90^{th}$ and all lower quantiles down to the $10^{th}$ quantile. Thus we can talk about a more prominent glass ceiling effect in the tradable sectors also based on the expanded specification. Inclusion of additional personal and workplace related controls do not change our major conclusions about the gender wage gap in the tradable sectors.

In the non-tradable sector, the inclusion of additional control variables only slightly lower the observed gender wage gap except the very high end of the distribution ($90^{th}$, $95^{th}$ and $99^{th}$). We observe a positive wage gap at and above the median in favor of women, which increases towards the end of the distribution. This positive gap is again mainly attributable to the positive coefficient effect in favor of women that outweigh the negative effect of discrimination against women. On the other hand there is a negative wage gap at the lower end of the distribution ($5^{th}$, $10^{th}$, $20^{th}$) that is fully attributable to the coefficient effect while the raw wage gap is not statistically significant at the $30^{th}$ and the $40^{th}$ percentiles (the positive characteristics effect and the negative coefficient effect cancel each other). The negative wage gap at the lower tail provides evidence of a sticky floor also based on the expanded specification. However, comparing the lower tail of the non-tradable sector distribution with the tradable sector one, we observe a larger wage gap in tradable-sectors that is solely attributable to the discriminatory component also with the expanded specification. When we use the restricted sample, it only lowers the raw gender wage gap observed at the lower tail of the tradable sector distribution while no significant change occurs above the median. The trends stay the same with the observed gap almost fully attributable to the discriminatory component. While we don't find a sticky floor, there is evidence of a glass ceiling in the tradable sectors based on the expanded specification and using the restricted sample. Also for the non-tradable sector, we observe

[21] Decomposition tables and graphs are not presented here due to space concerns but are available upon request.

a similar trend as before with a negative wage gap at the lower tail and a positive wage gap at the upper tail.

## 6. CONCLUSION

This paper studied how gender wage gap and its discriminatory component differ across tradable and non-tradable sectors in Turkey using quantile regression decomposition analysis. Consistent with the expectations of feminist trade theory, there exists a larger gender wage gap and wage discrimination in tradable sectors then there is in non-tradable sectors. Overall we can conclude that women face more discrimination in open sectors of the economy than they do in closed sectors. Surprisingly, women at the higher end of the distribution hold a wage advantage over men thanks to having better productivity-related characteristics than men in non-tradable sectors. Both a glass ceiling and a sticky floor is observed in the tradable sectors while the ceiling effect is stronger than the floor effect. The first part of the empirical analysis relying on decomposition technique finds that women are more prone to wage discrimination in the tradable sectors of the Turkish economy contrary to the expectations of mainstream theory. The second part of the analysis will further look at the issue of gender wage discrimination by analyzing how region-level measures of trade openness affects gender wage discrimination measured as residual wage gap controlling for other manufacturing industry related factors. This part will be presented in the final draft of the paper.

**REFERENCES**


Albrecht, James; Anders Bjorklund, Susan Vroman (2003) "Is There a Glass Ceiling in Sweden?" *Journal of Labor Economics*, vol. 21, no. 1.

Artecona, Raquel and Wendy Cunningham (2002) "Effects of Trade Liberalization on the Gender Wage Gap in Mexico" The World Bank Development Research Group/Poverty Reduction and Economic Management Network Working Paper.

Arulampalam Wiji, Alison L. Booth, and Mark L. Bryan (2007) "Is There A Glass Ceiling Over Europe? Exploring The Gender Pay Gap Across The Wage Distribution"*Industrial and Labor Relations Review*, Vol. 60, No. 2.

Autor, David. H., Lawrence. F. Katz, and Melissa S. Kearney (2005) "Rising Wage Inequality: The Role of Composition and Prices", MIT mimeo.

Becker, G. (1971) *The economics of discrimination* (2nd ed.). Chicago: University of Chicago Press.

Bergman, Barbara (1974) "Occupational segregation, Wages and Profits when Employees Discriminate by Race or Sex" *Eastern Economic Journal.* 1(2/3): 103-10.

Berik**,** Gunseli; Rodgers, Yana van der Meulen; Zveglich, Joseph E., Jr. (2004) "International Trade and Gender Wage Discrimination: Evidence from East Asia" *Review of Development Economics*, May 2004, 8(2): pp. 237-54.

Berik**,** Gunseli (2000) "Mature Export-Led Growth and Gender Wage Inequality in Taiwan" *Feminist Economics*, November 2000, (6) 3: pp. 1-26

Bhagwati J. (2004) *In Defense of Globalization* New York: Oxford University Press.

Black, Sandra and Elizabeth Brainerd (2004) "Importing equality? The impact of globalization on gender discrimination" *Industrial and Labor Relations Review* 57(4): 540–559.

Blinder Alan (1973) "Wage discrimination: reduced form and structural estimates" *Journal of Human Resources*, 8: 436–455.

Boserup, E. (1970) *Women's Role in Economic Development*. New York: St Martin's Press.

Busse, Matthias and Christian Spielmann (2006) "Gender Inequality and Trade." *Review of International Economics*, 14(3): 362–79.

Cagatay, Nilufer and Gunseli Berik (1990) "Transition to Export-Led Growth in Turkey: Is There a Feminization of Employment?" *Review of Radical Political Economics*, Spring 1990, 22(1): 115-34.

Darity, William, and Rhonda Williams (1985) "Peddlers forever? Culture, competition and discrimination" *American Economic Review*, 75(2): 256–261.

Davis Donald R. and Prachi Mishra (2007) “Stolper-Samuelson Is Dead: And Other Crimes of Both Theory and Data” in: Ann Harrison (Ed.) *Globalization and Poverty*, NBER Books, National Bureau of Economic Research, Inc.

Dayioglu Meltem and Insan Tunali (2004) “Falling Behind While Catching Up: Changes in the Female–Male Differential in Urban Turkey, 1988 to 1994”, EALE/SOLE 2005, Unpublished Paper.

Dayioglu Meltem and Zehra Kasnakoglu (1997) “Women’s Labor Force Participation and Earnings Differentials between Genders in Turkey”, *METU Studies* 24(3): 329–361.

DiNardo, J., N. M. Fortin, and T. Lemieux (1996): "Labor Market Institutions and the Distribution of Wages, 1973-1992: A semiparametric approach", *Econometrica*, 65, 1001-1046.

El-Hamidi, Fatma (2008) “Trade Liberalization, Gender Segmentation, and Wage Discrimination: Evidence from Egypt” Economic Research Forum Working Paper 414.

Elson Diane, Caren Brown and Nilufer Cagatay (2007) “Mainstream, Heterodox and Feminist Theories of Trade” in Irene van Staveren et al. (2007).

Elson, Diane. 1995. “Male Bias in Macroeconomics: The Case of Structural Adjustment,” in Diane Elson (ed.) *Male Bias in the Development Process*, 2nd ed. pp. 164–90. Manchester, U.K.: Manchester University Press.

Ganguli, Ina and Katherine Terrell (2008) “On the Evolution of Gender Wage Gaps Throughout the Distribution in Ukraine” Unpublished paper.

Hazarika, Gautam and Rafael Otero (2004) “Foreign Trade and the Gender Earnings Differential in Urban Mexico” *Journal of Economic Integration,* 19(2): 353-73.

Horrace, William C., Beyza P. Ural, and Jin Hwa Jung (2006) “Inter-Industry Gender Wage Gaps By Knowledge Intensity: Discrimination And Technology In Korea” Syracuse University Center for Policy Research Working Paper No 79.

Joekes, Susan P. (1995) *Trade-Related Employment for Women in Industr y and Services in Developing Countries.* Geneva: United Nations Research Institute for Social Development, Occasional Paper No. 5.

Juhn, C., K. M. Murphy, and B. Pierce (1993): "Wage Inequality and the Rise in Returns to Skill", *Journal of Political Economy"*, 101, 410-442.

IIlkkaracan, Ipek and Raziye Selim (2007) “The Gender Wage Gap in the Turkish Labor Market” *Labour*, September 2007, (21) 3: 563-93.

Kongar, Ebru (2007) “Importing Equality or Exporting Jobs? Competition and Gender Wage and Employment Differentials in US Manufacturing” in Irene van Staveren et al. (2007).

Machado, J. A. F., and J. Mata (2005) "Counterfactual Decomposition of Changes in Wage Distributions using Quantile Regression", *Journal of Applied Econometrics*, 20, 445-465.

Melly Blaise (2005) "Decomposition of differences in distribution using quantile regression" *Labour Economics*, 12, 577-590.

Melly Blaise (2006) "Estimation of counterfactual distributions using quantile regression" Unpublished mimeo.

Menon, Nidhiya and Yana van der Meulen Rodgers (2009) "International Trade and the Gender Wage Gap: New Evidence from India's Manufacturing Sector" *World Development* Vol. 37, No. 5, pp. 965–981.

Nordman Christophe J. and Francois-Charles Wolff "Is There a Glass Ceiling in Morocco? Evidence from Matched Worker–Firm Data" *Journal of African Economies*, 18(4): 592–633.

Oaxaca, Ronald (1973) "Male Female Wage Differentials in Urban Labor Markets" *International Economic Review* 14(3): 693–709.

Oostendorp, Remco H. "Globalization and the Gender Wage Gap" *The World Bank Economic Review*, 23(1): 141-61.

Ozler, Sule (2000) "Export Orientation and Female Share of Employment: Evidence from Turkey" *World Development*, July 2000, 28(7) 1239-48.

Reilly, Barry and Puja Vasudeva Dutta (2005) "The Gender Pay Gap and Trade Liberalisation: Evidence for India" University of Sussex PRUS Working Paper no. 32

Rodriguez Francisco and Dani Rodrik (2000) "Trade Policy and Economic Growth: A Skeptic's Guide to the Cross-National Evidence" *NBER Macroeconomics Annual*, 15: 261-325.

Seguino, Stephanie (2005) "Gender Inequality in a Globalizing World" Presented at UNRISD Conference, March 7–8 2005, New York.

Seguino, Stephanie (2000) "Gender Inequality and Economic Growth: A Cross-Country Analysis." *World Development* 28(7):1211–30.

Seguino, Stephanie (1997) "Gender Wage Inequality and Export-Led Growth in South Korea." *Journal of Development Studies* 34(2): 102–32.

Standing, Guy (1989) "Global Feminization through Flexible Labor" *World Development*, July 1989, 17(7): 1077-95.

Stichter, Sharon (1990) "Women, Employment and the Family: Current Debates," in Sharon Stichter and Jane L. Parpart (eds.) *Women, Employment and the Family in the International Division of Labour*, pp. 11–71. Philadelphia, PA: Temple University Press.

Susanli, Bilgen (2009) “Essays on Labor Markets in Developing Countries”, Unpublished PhD Dissertation, Georgetown University.

Tansel Aysit (2005) ‘Public–Private Employment Choice, Wage Differentials and Gender in Turkey’, *Economic Development and Cultural Change* 53(2):453–477.

Williams, Rhonda (1987). Capital, competition, and discrimination: A reconsideration of racial earnings inequality. Review of Radical Political Economics, 19(2), 1–15

World Bank (2001) *Engendering Development through Gender Equality in Rights, Resources, and Voice*. World Bank Policy Research Report. New York: Oxford University Press

Van Staveren, Irene, Diane Elson , Caren Grown and Nilufer Cagatay (2007) *The Feminist Economics of Trade*, Routledge IAFFE Advances in Feminist Economics.

## Table 1 – Descriptive Statistics on Wages by Gender and Sector in the Private Sector

| | Non-Tradable | | | | | Tradable | | | | | Total | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Men | Women | Raw Gap (Men-Women) | Raw Gap (% of Men) | Total | Men | Women | Raw Gap (Men-Women) | Raw Gap (% of Men) | Total | Men | Women | Raw Gap (Men-Women) | Raw Gap (% of Men) |
| Average monthly wage (TL) | 618 | 626 | 591 | 35 | 94 | 587 | 606 | 502 | 104 | 83 | 605 | 617 | 557 | 60 | 90 |
| Standard deviation | 595 | 620.57 | 498 | | | 432 | 446 | 352 | | | 531 | 551 | 447 | | |
| 10th | 300 | 300 | 220 | 80 | 73 | 350 | 380 | 300 | 80 | 79 | 300 | 350 | 250 | 100 | 71 |
| 25th | 380 | 380 | 380 | 0 | 100 | 380 | 400 | 380 | 20 | 95 | 380 | 385 | 380 | 5 | 99 |
| 50th | 480 | 500 | 435 | 65 | 87 | 500 | 500 | 400 | 100 | 80 | 500 | 500 | 400 | 100 | 80 |
| 75th | 700 | 700 | 600 | 100 | 86 | 650 | 680 | 500 | 180 | 74 | 650 | 700 | 600 | 100 | 86 |
| 90th | 1000 | 1000 | 1000 | 0 | 100 | 900 | 995 | 750 | 245 | 75 | 1000 | 1000 | 950 | 50 | 95 |
| ln(average monthly wage) | 6.23 | 6.25 | 6.15 | 0.1 | | 6.24 | 6.28 | 6.07 | 0.2 | | 6.23 | 6.26 | 6.12 | 0.1 | |
| Std. Dev. | 0.57 | 0.55 | 0.62 | | | 0.49 | 0.47 | 0.54 | | | 0.54 | 0.52 | 0.59 | | |
| 10th | 5.70 | 5.70 | 5.39 | 0.3 | | 5.86 | 5.94 | 5.70 | 0.2 | | 5.70 | 5.86 | 5.52 | 0.3 | |
| 25th | 5.94 | 5.94 | 5.94 | 0.0 | | 5.94 | 5.99 | 5.94 | 0.1 | | 5.94 | 5.95 | 5.94 | 0.0 | |
| 50th | 6.17 | 6.21 | 6.08 | 0.1 | | 6.21 | 6.21 | 5.99 | 0.2 | | 6.21 | 6.21 | 5.99 | 0.2 | |
| 75th | 6.55 | 6.55 | 6.40 | 0.2 | | 6.48 | 6.52 | 6.21 | 0.3 | | 6.48 | 6.55 | 6.40 | 0.2 | |
| 90th | 6.91 | 6.91 | 6.91 | 0.0 | | 6.80 | 6.90 | 6.62 | 0.3 | | 6.91 | 6.91 | 6.86 | 0.1 | |
| ln(average hourly wage) | 0.82 | 0.81 | 0.86 | 0.0 | | 0.87 | 0.90 | 0.76 | 0.1 | | 0.84 | 0.85 | 0.82 | 0.0 | |
| Std. Dev. | 0.64 | 0.62 | 0.68 | | | 0.54 | 0.53 | 0.54 | | | 0.60 | 0.59 | 0.63 | | |
| 10th | 0.15 | 0.17 | 0.04 | 0.1 | | 0.33 | 0.36 | 0.22 | 0.1 | | 0.22 | 0.24 | 0.13 | 0.1 | |
| 25th | 0.46 | 0.46 | 0.46 | 0.0 | | 0.60 | 0.61 | 0.55 | 0.1 | | 0.51 | 0.51 | 0.51 | 0.0 | |
| 50th | 0.73 | 0.73 | 0.76 | 0.0 | | 0.81 | 0.84 | 0.73 | 0.1 | | 0.76 | 0.78 | 0.73 | 0.0 | |
| 75th | 1.14 | 1.10 | 1.20 | -0.1 | | 1.14 | 1.14 | 0.96 | 0.2 | | 1.14 | 1.14 | 1.10 | 0.0 | |
| 90th | 1.61 | 1.61 | 1.78 | -0.2 | | 1.50 | 1.54 | 1.32 | 0.2 | | 1.59 | 1.55 | 1.61 | -0.1 | |
| Average # of hours of work per week | 57.62 | 59.31 | 51.76 | 7.5 | | 54.36 | 54.98 | 51.65 | 3.3 | | 56.22 | 57.41 | 51.72 | 5.7 | |
| Std. Dev. | 14.17 | 13.97 | 13.26 | | | 10.72 | 10.88 | 9.62 | | | 12.93 | 12.91 | 11.96 | | |
| Tenure | 4.28 | 4.56 | 3.29 | | | 4.61 | 4.82 | 3.67 | | | 4.42 | 4.68 | 3.44 | | |
| Std. Dev. | 5.27 | 5.55 | 4.00 | | | 5.55 | 5.76 | 4.50 | | | 5.40 | 5.64 | 4.21 | | |

**Table 2 – Descriptive Statistics on Workers' Characteristics by Gender and Sector in the Private Sector**

| | Non-Tradable | | | Tradable | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Men | Women | Total | Men | Women | Total | Men | Women |
| Tenure | | | | | | | | | |
| (std. dev.) | | | | | | | | | |
| Male (%) | 77.6 | | | 81.3 | | | 79.2 | | |
| Age (%) | | | | | | | | | |
| 15-19 | 8.1 | 7.9 | 8.9 | 9.9 | 8.6 | 15.7 | 8.9 | 8.2 | 11.5 |
| 20-24 | 16.6 | 14.0 | 25.4 | 15.7 | 14.0 | 23.0 | 16.2 | 14.0 | 24.5 |
| 25-29 | 23.8 | 23.5 | 24.6 | 23.2 | 23.9 | 20.1 | 23.5 | 23.7 | 22.9 |
| 30-34 | 18.5 | 19.3 | 15.5 | 20.2 | 21.4 | 14.9 | 19.2 | 20.2 | 15.3 |
| 35-39 | 13.0 | 13.8 | 10.4 | 14.2 | 14.7 | 12.1 | 13.5 | 14.2 | 11.0 |
| 40-44 | 9.3 | 9.7 | 7.7 | 8.9 | 9.2 | 7.6 | 9.1 | 9.5 | 7.7 |
| 45-49 | 5.6 | 6.0 | 4.4 | 4.7 | 4.8 | 4.2 | 5.2 | 5.5 | 4.3 |
| 50-54 | 3.2 | 3.6 | 2.1 | 2.2 | 2.3 | 1.8 | 2.8 | 3.0 | 2.0 |
| 55-59 | 1.3 | 1.5 | 0.7 | 0.9 | 0.9 | 0.5 | 1.1 | 1.3 | 0.6 |
| 60-64 | 0.6 | 0.7 | 0.4 | 0.3 | 0.3 | 0.2 | 0.5 | 0.5 | 0.3 |
| Married (%) | 59.9 | 66.7 | 36.4 | 65.3 | 70.3 | 43.4 | 62.2 | 68.3 | 39.1 |
| Education (%) | | | | | | | | | |
| Illeterate | 0.9 | 0.7 | 1.8 | 1.3 | 0.9 | 3.1 | 1.1 | 0.8 | 2.3 |
| Non-graduate but Literate | 1.7 | 1.6 | 1.9 | 3.2 | 2.4 | 6.3 | 2.3 | 2.0 | 3.6 |
| Primary | 32.8 | 36.5 | 19.8 | 44.3 | 45.5 | 39.0 | 37.7 | 40.5 | 27.2 |
| Secondary | 17.6 | 19.6 | 10.7 | 18.6 | 18.8 | 17.9 | 18.0 | 19.2 | 13.4 |
| Regular High School | 17.1 | 15.5 | 22.6 | 9.9 | 9.4 | 12.5 | 14.0 | 12.8 | 18.7 |
| Technical High School | 14.8 | 14.3 | 16.6 | 15.3 | 16.3 | 10.6 | 15.0 | 15.2 | 14.3 |
| College or more | 15.2 | 11.8 | 26.7 | 7.4 | 6.7 | 10.7 | 11.9 | 9.6 | 20.6 |
| Social Security (%) | 67.9 | 68.0 | 67.6 | 73.1 | 75.0 | 65.1 | 70.2 | 71.1 | 66.7 |
| Firm size (%) | | | | | | | | | |
| Micro (<10) | 49.3 | 50.7 | 44.4 | 21.4 | 23.4 | 12.8 | 37.3 | 38.7 | 32.2 |
| Small (10-24) | 13.1 | 12.8 | 14.2 | 12.5 | 11.9 | 14.8 | 12.8 | 12.4 | 14.4 |
| Medium (25-49) | 15.8 | 15.3 | 17.5 | 16.4 | 15.7 | 19.6 | 16.1 | 15.5 | 18.3 |
| Medium/Large (50-299) | 15.9 | 15.4 | 17.6 | 28.5 | 27.6 | 32.5 | 21.3 | 20.8 | 23.3 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Large (250-499) | 3.3 | 3.2 | 3.4 | 8.8 | 8.8 | 8.9 | 5.6 | 5.7 | 5.5 |
| Very large (500+) | 2.6 | 2.5 | 2.9 | 12.4 | 12.6 | 11.5 | 6.8 | 7.0 | 6.2 |

| | Non-Tradable | | | Tradable | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Men | Women | Total | Men | Women | Total | Men | Women |
| Occupation (%) | | | | | | | | | |
| Manager | 4.7 | 4.9 | 4.0 | 2.1 | 2.0 | 2.3 | 3.6 | 3.6 | 3.4 |
| Professional | 6.1 | 4.6 | 11.3 | 2.3 | 2.1 | 3.2 | 4.5 | 3.5 | 8.2 |
| Tech/Assoc.Prof. | 10.7 | 10.0 | 13.1 | 7.4 | 6.5 | 11.6 | 9.3 | 8.4 | 12.5 |
| Clerk | 13.6 | 9.6 | 27.5 | 5.3 | 4.3 | 9.6 | 10.0 | 7.3 | 20.6 |
| Servive/Sales | 28.9 | 29.2 | 27.8 | 3.2 | 3.2 | 2.9 | 17.9 | 17.8 | 18.2 |
| Skilled Agri/Fish. | 0.4 | 0.5 | 0.0 | 0.8 | 0.8 | 0.4 | 0.6 | 0.7 | 0.2 |
| Crafts/Trades | 11.2 | 14.1 | 1.2 | 34.1 | 36.4 | 24.5 | 21.0 | 23.9 | 10.1 |
| Operators/Assemblers | 10.5 | 13.3 | 0.7 | 32.5 | 32.9 | 30.9 | 19.9 | 21.9 | 12.3 |
| Elementary | 13.9 | 13.7 | 14.4 | 12.5 | 11.9 | 14.7 | 13.3 | 12.9 | 14.5 |
| Full-time (%) | 98.6 | 99.0 | 97.0 | 99.5 | 99.7 | 98.8 | 99.0 | 99.3 | 97.7 |
| Urban (%) | 82.4 | 81.1 | 87.1 | 79.8 | 79.8 | 79.6 | 81.3 | 80.5 | 84.2 |
| Region (%) | | | | | | | | | |
| Istanbul | 29.8 | 28.9 | 33.2 | 33.1 | 31.2 | 41.4 | 31.2 | 29.9 | 36.3 |
| Western Marmara | 3.7 | 3.6 | 4.1 | 4.7 | 4.4 | 5.6 | 4.1 | 4.0 | 4.7 |
| Aegean | 13.0 | 13.0 | 13.0 | 15.0 | 14.2 | 18.4 | 13.8 | 13.5 | 15.1 |
| Eastern Marmara | 9.0 | 9.0 | 9.2 | 18.5 | 18.0 | 20.3 | 13.0 | 12.9 | 13.5 |
| Western Anatolia | 11.7 | 11.3 | 12.9 | 7.2 | 8.0 | 3.7 | 9.7 | 9.8 | 9.4 |
| Mediterranean | 13.6 | 13.3 | 14.7 | 7.6 | 8.4 | 4.3 | 11.1 | 11.1 | 10.7 |
| Middle Anatolia | 3.5 | 3.8 | 2.2 | 3.2 | 3.7 | 0.9 | 3.4 | 3.8 | 1.7 |
| Western Black Sea | 4.5 | 4.6 | 4.1 | 3.7 | 3.9 | 2.6 | 4.2 | 4.3 | 3.6 |
| Eastern Black Sea | 3.4 | 3.6 | 2.9 | 1.4 | 1.5 | 1.4 | 2.6 | 2.6 | 2.3 |
| Northwest Anatolia | 1.3 | 1.4 | 0.9 | 0.5 | 0.6 | 0.1 | 1.0 | 1.0 | 0.6 |
| Mideast Anatolia | 2.5 | 2.9 | 1.1 | 1.3 | 1.5 | 0.5 | 2.0 | 2.2 | 0.9 |
| Southeast Anatolia | 4.0 | 4.7 | 1.5 | 4.0 | 4.8 | 0.7 | 4.0 | 4.7 | 1.2 |
| Number of obs. | 26435 | 20250 | 6185 | 20049 | 16007 | 4042 | 46484 | 36257 | 10227 |

**Figure 1 – Kernel Wage Densities by Gender and Sector in the Private Sector**

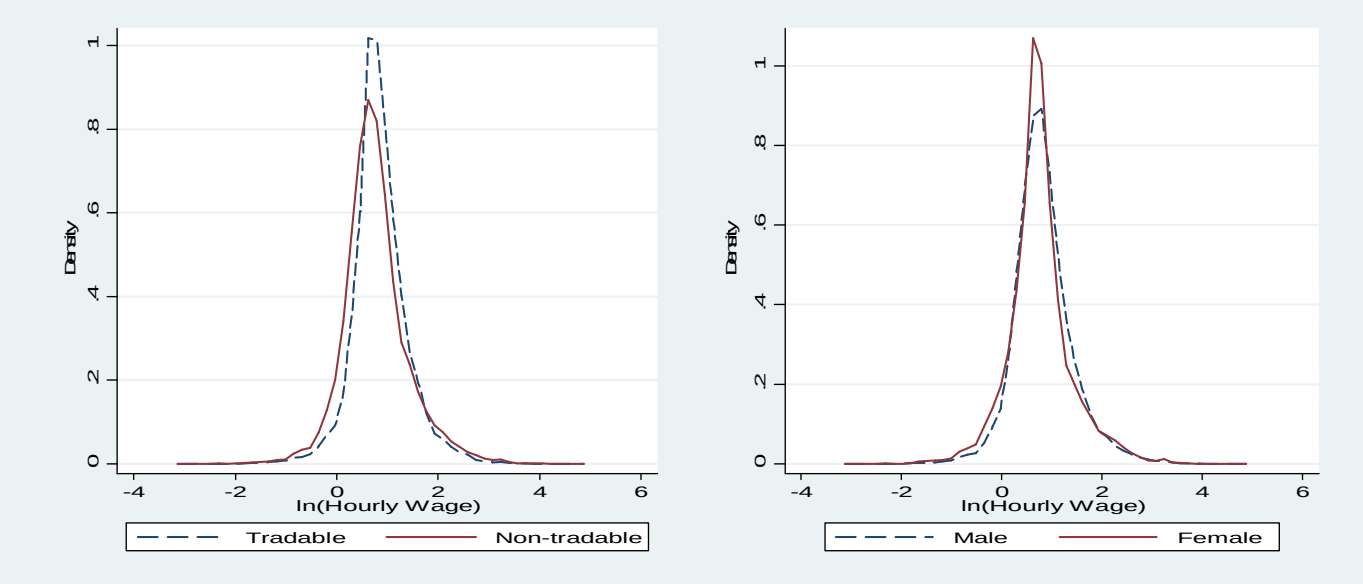

**Figure 2 – Kernel Wage Densities for Men and Women in Tradable and Non-tradable sectors respectively**

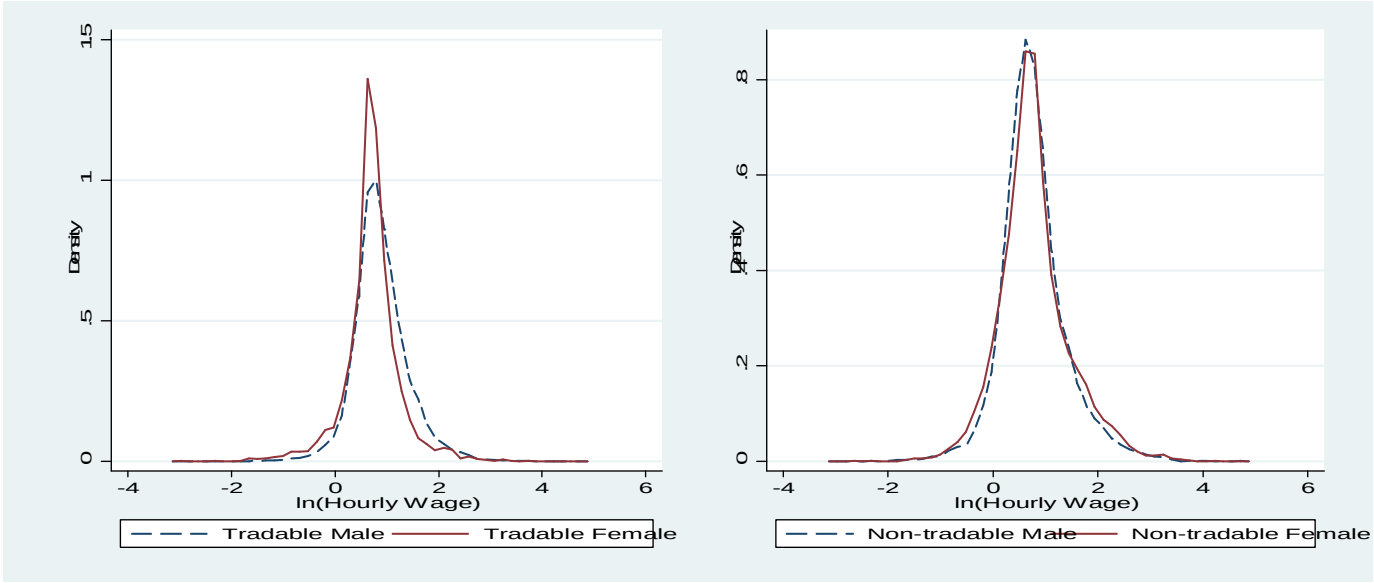

**Table 3 – Oaxaca-Blinder Decomposition of the Gender Wage Gap**

| | Tradable | | | | Non-tradable | | | |
|---|---|---|---|---|---|---|---|---|
| | Basic | | Expanded | | Basic | | Expanded | |
| | Unrestricted | Restricted | Unrestricted | Restricted | Unrestricted | Restricted | Unrestricted | Restricted |
| Difference | 0.146 | 0.123 | 0.146 | 0.123 | -0.046 | -0.040 | -0.046 | -0.040 |
| Std. error | 0.010 | 0.010 | 0.010 | 0.010 | 0.011 | 0.011 | 0.011 | 0.011 |
| p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Explained | 0.019 | 0.016 | -0.001 | -0.006 | -0.099 | -0.100 | -0.084 | -0.087 |
| Std. error | 0.007 | 0.007 | 0.008 | 0.008 | 0.008 | 0.008 | 0.009 | 0.009 |
| p-value | 0.011 | 0.028 | 0.887 | 0.433 | 0.000 | 0.000 | 0.000 | 0.000 |
| Unexplained | 0.127 | 0.107 | 0.147 | 0.129 | 0.054 | 0.059 | 0.038 | 0.047 |
| Std. error | 0.009 | 0.008 | 0.008 | 0.008 | 0.009 | 0.009 | 0.009 | 0.008 |
| p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | | | % of Differential | | | | |
| Difference | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Explained | 12.8 | 13.2 | -0.8 | -5.1 | 217.6 | 247.3 | 184.1 | 215.4 |
| Unexplained | 87.2 | 86.8 | 100.8 | 105.1 | -117.6 | -147.3 | -84.1 | -115.4 |

**Table 4 – Decomposition of Gender Wage Gap at Selected Quantiles (Basic Specification using the Unrestricted Sample)**

| *Tradable Sectors (Figure 3)* | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unrestricted Sample | 1th | 5th | 10th | 20th | 30th | 40th | 50th | 60th | 70th | 80th | 90th | 95th | 99th |
| Raw gap | -0.498 | -0.174 | -0.113 | -0.093 | -0.094 | -0.105 | -0.123 | -0.145 | -0.166 | -0.187 | -0.197 | -0.159 | -0.073 |
| (Boostrapped std. errors) | 0.071 | 0.028 | 0.016 | 0.011 | 0.008 | 0.007 | 0.007 | 0.008 | 0.010 | 0.013 | 0.022 | 0.037 | 0.065 |
| p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.259 |
| Characteristics effect | -0.079 | -0.038 | -0.021 | -0.016 | -0.019 | -0.021 | -0.022 | -0.024 | -0.022 | -0.018 | -0.001 | 0.036 | 0.096 |
| (Boostrapped std. errors) | 0.025 | 0.011 | 0.008 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.007 | 0.008 | 0.012 | 0.018 | 0.028 |
| p-value | 0.298 | 0.166 | 0.148 | 0.125 | 0.018 | 0.003 | 0.002 | 0.005 | 0.021 | 0.121 | 0.980 | 0.292 | 0.110 |
| Coefficient effect | -0.419 | -0.137 | -0.091 | -0.077 | -0.075 | -0.083 | -0.100 | -0.121 | -0.144 | -0.169 | -0.197 | -0.195 | -0.169 |
| (Boostrapped std. errors) | 0.076 | 0.027 | 0.015 | 0.010 | 0.008 | 0.007 | 0.007 | 0.008 | 0.010 | 0.012 | 0.020 | 0.034 | 0.060 |
| p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.005 |
| *Non-tradable Sectors (Figure 4)* | | | | | | | | | | | | | |
| Unrestricted Sample | 1th | 5th | 10th | 20th | 30th | 40th | 50th | 60th | 70th | 80th | 90th | 95th | 99th |
| Raw gap | -0.068 | -0.102 | -0.078 | -0.036 | -0.009 | 0.016 | 0.044 | 0.073 | 0.107 | 0.145 | 0.171 | 0.160 | 0.129 |
| (Boostrapped std. errors) | 0.043 | 0.020 | 0.014 | 0.010 | 0.009 | 0.009 | 0.009 | 0.010 | 0.012 | 0.016 | 0.023 | 0.031 | 0.053 |
| p-value | 0.111 | 0.000 | 0.000 | 0.000 | 0.289 | 0.066 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.015 |
| Characteristics effect | -0.003 | 0.017 | 0.031 | 0.045 | 0.055 | 0.063 | 0.077 | 0.094 | 0.125 | 0.175 | 0.238 | 0.243 | 0.170 |
| (Boostrapped std. errors) | 0.017 | 0.010 | 0.007 | 0.007 | 0.006 | 0.006 | 0.007 | 0.008 | 0.010 | 0.012 | 0.015 | 0.016 | 0.019 |
| p-value | 0.941 | 0.341 | 0.014 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 |
| Coefficient effect | -0.065 | -0.119 | -0.109 | -0.081 | -0.064 | -0.047 | -0.033 | -0.022 | -0.018 | -0.030 | -0.067 | -0.083 | -0.041 |
| (Boostrapped std. errors) | 0.041 | 0.018 | 0.012 | 0.009 | 0.008 | 0.007 | 0.007 | 0.008 | 0.011 | 0.015 | 0.024 | 0.031 | 0.050 |
| p-value | 0.115 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.009 | 0.087 | 0.054 | 0.005 | 0.007 | 0.418 |

Areas highlighted as grey indicates the components that are not significant at the 5% significance level.

**Figure 3 – Decomposition of the Gender Wage Gap across the Entire Distribution (Tradable – Basic– Unrestricted Sample)**

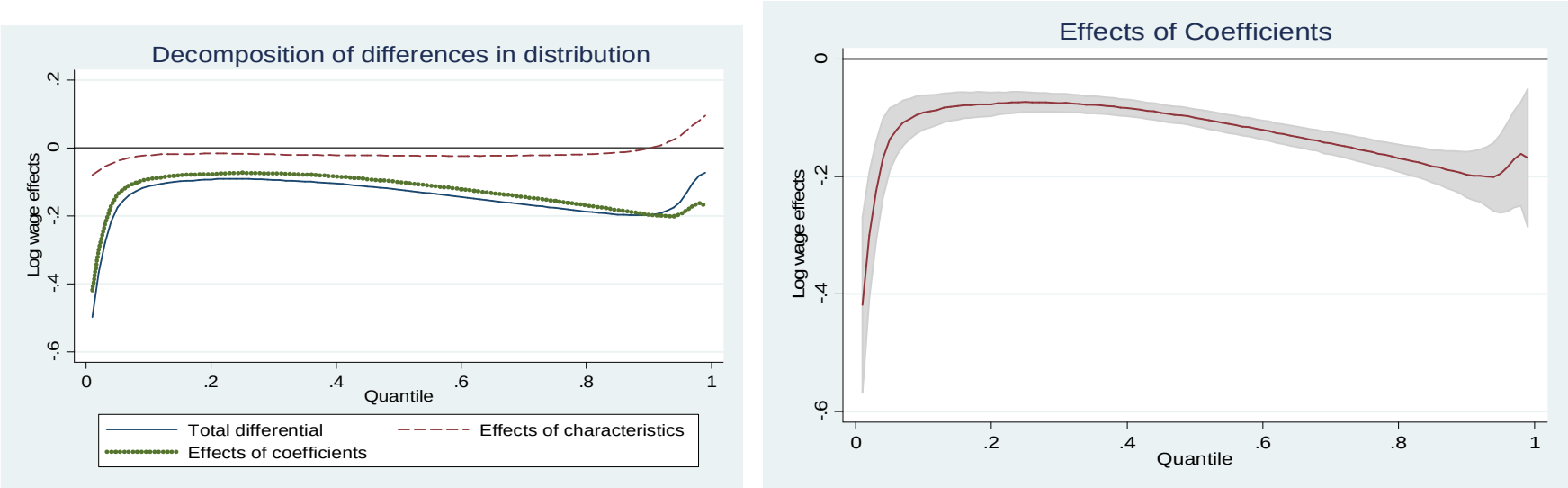


**Figure 4 – Decomposition of the Gender Wage Gap across the Entire Distribution (Non-tradable – Basic– Unrestricted Sample)**