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**Current Gender Trends in Belarusian Labor Market: Wage Gap, Child Penalty and Marriage Premium**

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**Abstract**

The issue of gender equality in Belarus labor market is still unclear. On the one hand the rate of female participation is high. At the same time there is evidence of the rising gender pay gap that grew from 16.5% in 2005 to 24% in 2014. The decomposition of the wage gap during 2005-2014 time period using Oaxaca-Blinder, Juhn-Murphy-Pierce and Machado-Mata techniques revealed that differences in income function (the difference in a way efforts of men and women are remunerated) are the main factors affecting the growth of gender inequality, while the personal characteristics are losing the influencing power. The role of the factors differs depending on the quantile of income distribution. I also find no association between wages and marriage for females, while there is a 10.5% wage premium in case of married males. The parenthood wage penalty is attributed to women and equals approximately 14.4%. Moreover, children from 0 to 6 provide the most severe drop in wages. In addition, the paper reveals that educated women are suffering the most and face 20.4% decline in wages, while penalty for women with the secondary school or lower amounts to just 8%.

**Keywords:** Gender wage gap, marriage premium, maternity penalty

**JEL Classification:** J31, J12, J13, J16

## 1. Introduction

Problem of gender inequality in the labor market is familiar to the majority of economies and solution of this issue keeps attracting attention and efforts worldwide. Belarus is not an exception. However, there are certain peculiarities of the situation in the Belarusian labor market.

First, country is still on its transition path from the planned to the market economy. This is reflected in absence of structural reforms, very slow and invisible privatization process as well as very weak level of market liberalization. The state sector keeps playing a significant role. Belarusian labor market keeps preserving heritage of the Soviet past. Even though the role of the state sector is declining lately, there is still a tangible amount of the private enterprises with the state presence and indirect state control (Figure 1). As a result, the share of gross value added (GVA) produced under state control keeps being around 50%.

The dominance of the state in the Belarusian economy results in implementation of the full employment policy, which explains low mobility (lack of motivation in search for a new workplace or occupation) as well as low level of unemployment (in 2015 it equaled to 4.1% according to the official statistics provided by BELSTAT). That is because enterprises are still more concentrated on accomplishing social functions rather than increasing of competitiveness and improving performance. As a result, there were no significant fluctuations in the labor market and the structure of employment has not changed much during the last decade. Female active involvement into the labor force keeps being higher than males and fluctuates around 83% (Figure 2). However, at the same time the difference between male and female wages is increasing and the gender pay gap has grown by almost twice during the last 10 years (Figure 3) from 16.5% in 2005 to almost 28 in 2014 (BHSIE provided by BELSTAT). The official statistics shows that, as of 2015, the unadjusted gender wage gap equaled to 23.8%. Likely one of the reasons of these two facts going together is that the country is still on its way from the Soviet governance model with the egalitarian concept towards the western market model of control. As a result, Belarus is somewhere in between. On the one hand the state doesn't have sufficient funds to continue financing equality. On the other hand, it still pushes the ideas of socialistic model that mostly focuses on quantitative and not qualitative indicators of effectiveness resulting in high level of employment in the country.

This paper tries to answer the questions “what are the reasons of difference in remuneration for men and women in Belarus?”, “is the gap the same for all income groups?” and performs a comparative analysis of various methods of gender pay gap decomposition. It starts with usual Oaxaca-Blinder (OB) method (1973) that allows estimating the selectivity corrected wage equations and then decomposing the wage gap at means into the explained and unexplained parts. Next, the research proceeds with Juhn-Murphy-Pierce (JMP) and Machado-Mata (MM) techniques introduced by Juhn, Murphy and Peerce (1993) and Machado and Mata (2005) and adjusted by Melly (2008) allowing looking at the pay gap at different deciles of earnings’ level and to decompose it into both observable and unobservable parts. In addition, MM method allows looking into the dynamics of the pay gap during the 2005-2014 timeframe.

Another relevant question is the impact of the family on the level of earnings. First, how marriage is affecting the wages and whether there is a wage premium attributed to marriage? Second, is there a childbearing penalty that lowers the level of payment?

The problems of decline in fertility together with aging population keep attracting attention of the local authorities during the last decade. Situation in Belarus goes in line with the overall drop in fertility observed in post-USSR countries. There was a significant decline in 1990s after the collapse of the USSR and the total fertility level reached its’ minimum (1.2) in the beginning of 2000s. The policymakers kept trying implementing policy aimed at boosting the growth of childbearing in the country. These attempts resulted in the appearance of the upward trend. However, the current level is still lower (1.62 in 2014 vs. 1.91 in 1991) than it used to be in the beginning of the 1990 (Figure 4). Thus, such tendencies raise a question of how children impact wages of parents, because the existence of negative effect likely does not have a positive impact on the overall country’s fertility level.

Finally, despite equal participation of men and women in the labor force, Belarus keeps following certain conservative view on gender roles in families. This implies dominance of a male breadwinner model in the society and specialization theory (Becker, 1971) so that men focus on investing into the market activities, while women specialize in household duties as well as career. At the same time, the divorce rates in Belarus keep being at the high level and just around 50% of marriages end up successfully while the other half falls apart (Figure 4). That fact should diminish incentives of women in focusing on household chores and therefore lower the effect of specialization in general. Thus, the question of interest here is whether the global

tendencies that married men are on average more productive and earn more than single ones are true for Belarus as well. Currently, the level of participation of the married women in the Belarusian labor force does not differ much from the rate of married men participation. This raises a question of whether there is a marriage wage premium that stimulates women from staying at home and joining the labor market or it is the situation in the economy that forces women to join the labor market in order to help their families to survive.

This research project aims to expand the understanding of current gender trends in the Belarusian labor market. This paper contributes to the existing literature in a number of ways. First, it provides evaluation of the gender pay gap for the current decade and fills the gap between the current tendencies and the study by Verashchagina and Pastore (2011) that evaluated the 1996-2005 time period. Second, this is the first study that looks at existence of childbearing penalties and marriage premium in Belarus.

The results obtained showed that usage of different decomposing methodologies provides certain differences in explanation and emphasis of existing gender wage gap. The results of the OB, JMP and MM decomposition showed that the gender pay gap is mostly due to differences in the coefficients, i.e. the way men and women are translating their efforts into the pecuniary benefits. In addition the JMP and MM techniques demonstrate that on average the pay gap on top of distribution is higher than at the bottom; but the growth rates of the pay gap at the lowest percentiles were much more impressive during 2005-2014. Moreover, they revealed that the direction and strength of impact of personal characteristics on the difference in earnings varies all over the wealth distribution and time.

There is evidence of significant positive effect of being married on male wages and no effect on female. Childbearing diminishes the level of female remuneration by 14.4% and this effect holds for different age groups of children as well as mothers of different educational background.

The rest of the paper is organized in the following way. Section 2 provides an overview of the related literature. Section 3 explains the methodological approach of the analysis. Section 4 shows how data was constructed and describes it. Section 5 presents estimates results. Section 6 summarizes the paper.

## 2. Literature

### Gender Wage Gap

Various sources demonstrate significant difference between male and female earnings. According to the European statistics, in 2014 on average the level of female wages was around 16% lower compared with male<sup>1</sup>. The difference in wages varied across EU countries with the lowest pay gap observed in Slovenia (2.9%) and the highest (28.3%) in Estonia. The same holds for the OECD countries, where the average pay gap was around 15% in 2014<sup>2</sup>. Different reasons could explain the existence of the pay gap like different types of jobs and sectors occupied by men and women, work-life balance, breaks in career path due to childbearing and other. It should be noted that discrimination in the labor market can also be a serious and significant influencing factor.

The literature on the reasons of the gender pay gap is divided into certain blocks. This issue started attracting attention in the 1970s-1980s, when the role of female in the society differed greatly from nowadays. The first block of factors that explain difference in earnings is about the quality of the human capital. Next goes distribution of males and females among various sectors of economy that provide unequal return on employment. Finally, discrimination factor is also a potential explaining reason resulting in a gender pay gap.

In the majority of countries still prevails the male breadwinner model meaning that men mostly focus on the raise of family's income while women take control over the household duties as well as child bearing. The demand on women in the labor market is lower compared with men due to their lower level of experience, presence of required skills and knowledge as well as lower level of commitment to the employer and incentives to spend time on investing into education (Blau and Kahn, 1997; Warren et al, 2001; Booth and Francesconi, 2003; Manning and Swaffield, 2008). This leads to the lower level of human capital, performance and level of female earnings. It is also important to take into account the differences in the process of socialization applicable for both genders as well as diversity in risk-averseness (Mueller and Plug, 2006; Eckel and Grossman, 2008; Croson and Gneezy, 2009; Ahren and Dittmar; 2011; Lavy, 2012). Besides, various personal characteristics like voluntarism are also important (Niederle, 2008). Amuedo-Dorantes and de la Rica (2006) analyzed the gender wage differential in Spain and

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<sup>1</sup>[http://ec.europa.eu/eurostat/statistics-explained/index.php/Gender\\_pay\\_gap\\_statistics#Gender\\_pay\\_gap\\_levels](http://ec.europa.eu/eurostat/statistics-explained/index.php/Gender_pay_gap_statistics#Gender_pay_gap_levels)

<sup>2</sup><https://data.oecd.org/earnwage/gender-wage-gap.htm>

obtained results showing that around 40% of males' salaries are formed by the overtime payments. At that these payments accounted for up to 80% of the gender pay gap in the labor market due to women's unwillingness and inability to work longer hours at the same level as men.

Differences in values and goals impact on the market segregation, so that women tend to choose industries that provide them with various non-monetary benefits. These could be less harsh working conditions, presence of some social package, flexible schedule as well as possibility to work part-time. Thus, women tend to choose the low-paying industries of companies because of other potential benefits they obtain while working there (Sorensen, 1990; Reilly and Wirjanto, 1999; Bayard et al., 2003; Jurajda, 2005; Triventi, 2011). However, the other side of the coin is that the payoff in these industries is lower compared with the male sectors of economy (Anker, 1997) and such choice preferences likely impact on the growth of the gender pay gap.

Discrimination of women in the labor market can also be a significant part in explanation of the pay gap. However, it is possible to mention gender discrimination only in case there are no differences in characteristics and productivity. The discrimination model was first mentioned by Becker, 1957) in the middle of 20<sup>th</sup> century. The author divided discrimination into three groups: discrimination by employer, co-worker and client. This paper focuses on the first most common type of discrimination that is about the negative attitude of employer towards one specific group and women in particular. In this case the utility function of the employer is in opposite relationship with a number of hired women. As a result he pays the female group lower salary or conversely provides a raise to males (Oschepkov, 2006). However, Bekcer's model is often criticized as in case of market competition such employers will suffer additional losses due to such kind of favoritism.

Empirical papers on women discrimination provide quite ambiguous results. Tijdenset al. (2002) looked at the wage differences in Holland and found that around 28.5% of the pay gap is unexplained, so that discrimination can be partly an exogenous reason. At the same time Albrecht et al. (2004) also focused on the Dutch labor market and concluded that the wage difference is due to variety in return and wealth function of males and females. Jolliffe (2002) investigated the issue of female discrimination in the Bulgarian labor market. The obtained results showed that the major part of the pay gap is because of the discrimination factor

proving the statement that Bulgaria failed in some way in promotion of gender equality in the economy and the further legislation acts on equal-payment are vital for the country. Similar results were obtained by Cudeville and Gurbuzer (2007) for the case of Turkey. The authors showed that around 60% of the gender pay gap in Turkey is due to the discrimination factor. Similar figures for Turkish labor market were obtained by Ilkkaracan and Selim (2007). In their estimations the discrimination factor formed around 44% of the wage differential. Magnani and Zhu (2010) looked at whether there is discrimination of female rural-urban migrants in China. The authors came up with the evidence of the discrimination in the labor market. Moreover, the results showed that the discrimination effect becomes more severe in case of the earners located in the lowest 20% of distribution. Goraus (2012) looked at the gender wage gap in Poland and came up with the results that the unexplained component forms around 20% of the wage difference in the Polish labor market.

Evidence from the former USSR shows that on average the gender wage gap equals to 20-45% depending on country (Oshchepkov, 2006; Gangulli and Terrell, 2006; Khitarishvilli, 2009, Nachkebia, 2010). As for the unexplained part, its' role also varies from country to country. In Russia and Georgia the discrimination factor forms the major part of the pay gap, while in Ukraine the main role is played by the differences in the wealth function.

As for Belarus, there is only one work by Verashchagina and Pastore (2011) that looked into the nature of the wage gap in the country. The authors used the 1995-2006 time period and came up with the results, that mostly these are differences in rewards and personal characteristics that explain the gender wage gap in the labor market.

### **Gender, childbearing penalty and marriage premium**

Lately the research on gender wage gap came up with the conclusion that despite the decline in the wage differential worldwide, the gender inequality perceives, and parenthood is the major explaining factor of it. At that women face around 20% wage reduction, while men do not (Kleven et al., 2016). Childbearing penalty can be defined as a decline in wages or earnings caused by the appearance of children. This penalty is mostly attributed to mothers' earnings as they are more involved in taking care of children compared with men (Correll, Benard, & Paik, 2007) and children start affecting the motives so that non-pecuniary benefits begin playing more significant role compared with the level of salary. Besides, there is also an explanation that children impact on women's effectiveness at work and therefore decrease their

productivity (Albanesi and Olivetti 2009). Oppositely, fathers mostly do not have to deal with the reduction of wages due to parenthood (Petersen et al., 2007; Gungor&Biernat, 2009). Again, this can be associated with the traditional roles of males and females in the family, where men are considered as the major breadwinners in the household and therefore are more motivated to strive for the higher level of salaries (Blau and Kahn, 2016).

As for the marriage premium, again, mostly the literature demonstrates that this premium can be attributed to the main earner in the family. On the one hand existence of such premium can be associated with the selection criteria. That means that there are certain personal features that attract attention of not just the employer or entrepreneur but also potential marriage partner (Becker, 1981). Thus, marriage premium is a signal that indicates about certain beneficial features of the individual. On the other hand the effect is closely associated with the specialization within the household. So that one member mostly focuses on outside household activities and is more motivated on the raise of personal effectiveness and earnings at work, while another is interested in internal actions. A significant part of the research devoted to that issue shows the existence of marriage premium in case of male wages (Loh, 1996; Chun and Lee, 2001; Breusch and Gray, 2004; Killalewald and Gough, 2013) while in case of women the results are not that straightforward. Budig and Lim (2016) showed that those members of the household who are concentrated on money making process gain additional premium from being married, while similar reward cannot be attributed to household members involved in non-market activities.

### 3. Methodology

The study is based on the typical Mincerian model that estimates individual return on various influencing factors (Mincer, 1974):

$$\ln w_{it} = \alpha + \delta_i X_{it} + \gamma_i \lambda_{it} + u_{it}, \quad u_i = N(0, \sigma^2) \quad (1)$$

$\ln w_{it}$  - log of monthly earnings of person i at year t

$X_i$  – vector of explanatory factors that affect individual level of earnings

$\lambda_i$  - the inverse Mills Ratio correcting for selectivity bias

The Heckman correction technique (1979) is applied in the research due to potential problem of sample selection process meaning that the choice on joining the active labor force is done not on random but is driven by maximum utility and different unobservable factors. As each individual aims to maximize the expected utility, the choice selection depends on comparison of those utilities. Thus person  $i$  will switch to employment if the utility is higher in comparison to staying at home. The probability that individual chooses employment can be estimated using usual probit technique:

$$prob(inlf_{it} = 1) = \Phi(\alpha T_{it} + \varepsilon_{it}), \quad (2)$$

where  $inlf_{it}$  – is a dummy variable that equals to one in case person  $i$  is in the labor force in year  $t$ ;

$T_{it}$  – vector of factors affecting person's  $i$  choice.

Decision to be involved into the labor force on the one hand depends on personal reservation wage that is the minimum value at which person  $i$  is willing to be actively involved into the labor market despite all other opportunities for the time spending. On the other hand the market wage rate matters, that is the level of payment the employer is willing to pay to the potential employee. Thus, person  $i$  decides to join the labor market and accept the job only in case the market wage rate is higher than the reservation rate.

### **Childbearing Penalty and Marriage Premium**

The main focus of this section is on estimating the impact of children and marital status on the wages of males in females in Belarus.

The initial model is described by the usual Mincerian wage equation described above (1). The effect of the marital status is captured by inclusion of the control variable  $MST_{it}$  – marital status of person  $i$  in year  $t$ . Thus, the model takes form:

$$\ln w_{it} = \alpha + \delta_i X_{it} + MST_{it} + \gamma_i \lambda_{it} + u_{it} \quad (6)$$

Regarding the childbearing effect, the effect is estimated by inclusion of various indicators that control for presence of children of different age groups as well as their quantity. First, the number of children is included into the regression:

$$\ln w_{it} = \alpha + \delta_i X_{it} + Q_{it} + \gamma_i \lambda_{it} + u_{it}, \quad (7)$$

where  $Q_{it}$  – denotes the number of children. Next, children are split into certain age categories:

$$\ln w_{it} = \alpha + \delta_i X_{it} + Q15_{it} + Q612_{it} + Q13_{it} + \gamma_i \lambda_{it} + u_{it}, \quad (8)$$

where  $Q15_{it}$  – indicates number of children of age from 0 to 5;  $Q612_{it}$  - number of children of age from 6 to 12 and  $Q13_{it}$  - number of children of age from 13 and above.

I also control for the cross-effect of age groups and quantity of children and the impact of children on mothers with different educational background.

### **Gender Wage Gap Decomposition**

The decomposing procedure includes a number of techniques, as they all have certain strong and weak sides. First, the Oaxaca-Blinder decomposition (1973) is applied. Usage of that method allows obtaining the decomposition of mean difference in earnings between men and women. The gap is split into parts that explain differences in endowments, return on endowments and unexplained gap.

$$\Delta W_{m,f} = \beta^f * \mu * (X_m - X_f) + \mu * X_f * (\beta_m - \beta_f) + (\mu * (X_m - X_f)) * (\beta_m - \beta_f), \quad (3)$$

where  $\mu$  - conditional mean function for males and females.

The first part of the equation describes difference in characteristics, the second part – difference in return on these characteristics and the third part – the interaction term of the first two components including the unexplained part.

The main problem with the Oaxaca-Blinder decomposition is that it only performs decomposition of wages at their means and therefore does not take into account the potential diversity in a size of pay gap depending on the income percentile.

Unlike Oaxaca-Blinder decomposition, technique introduced by Juhn, Murphy and Pierce (1993) allows separation of the difference not only at means but also at certain quartiles of the wage distribution. This technique also allows isolation of gap occurred due to endowments (quantity) effect, coefficients (price effect) and unobserved factors. Moreover, the JMP technique decomposes the unobserved effect into the price and quantity parts allowing obtaining more precise information on the nature of the pay gap. The JMP technique provides information on

what is the situation with the wage distribution below and above the mean numbers. And due to possibility to decompose the wage gap within various quartiles, the differential decomposition takes the following form:

$$\overline{\Delta W_{m,f}^q} = \beta^m * (\overline{X_m^q} - \overline{X_f^q}) + \overline{X_f^q} * (\beta_m - \beta_f) + (\overline{\varepsilon_m^q} - \overline{\varepsilon_f^q}), \quad (4)$$

where q stands for the quartile q,

$\overline{\varepsilon_m^q}, \overline{\varepsilon_f^q}$  – difference in means of unobservable factors affecting the wage difference at quartile q.

The drawback of the JMP decomposing method is inability to look at the decomposition of the pay gap within the whole wage distribution. Besides, the JMP method does not take into account the problem of potential heteroscedasticity and by assumption considers the error terms to be independent. At that in case of incorrect model allocation and dependency of the error term the results will be inefficient and decomposition will provide incorrect results.

This possibility provides the Machado-Mata technique (2005) and Melly (2008) and allows looking into the nature of the pay gap within along all deciles of the level of earnings in order to estimate counterfactual unconditional distribution of gender the pay gap (Landmesser et al., 2015). That means that oppositely to Oaxaca-Blinder method, the decomposition here is forming a counterfactual distribution of  $W_f$  and tries estimate the level of female wages in case the wages' structure equal to males one (Castagnetti, 2015). In addition, this method also accounts for the heteroscedasticity (Melly, 2008). Besides, one of the main differences of this method is that it combines both quantile regressions with the bootstrapping simulation. As a result, this method allows detaching the effects due to differences in characteristics, remuneration and unobservable part all over the deciles of earnings' distribution:

$$\Delta W_{m,f}^d = (\widehat{W}_m^d - \widetilde{W}_f^d) + (\widetilde{W}_f^d - \widehat{W}_f^d) + \text{residual}, \quad (5)$$

where d denotes decile,  $\widehat{W}$  - stands for wages of men and women in the observed sample and  $\widetilde{W}$  – captures the counterfactual level of wages. Thus, here the first part describes the endowment effect, while the second showing the gap in remuneration and the third - unobserved can be attributed to discrimination.

#### 4. Data Description

This paper is based on the data from the Belarusian Household Survey on Incomes and Expenditures (BHSIE) for the time period from 2005 to 2014. The survey is basically a representative sample of the households from all over the country. The annual number of the households interviewed in the survey amounts to around 5000. All members of the households included into the sample are answering the questionnaire allowing increasing the reliability of the collected information.

The analysis is performed separately for working age men (16-60) and women (16-55). Self-employed, retired and students were excluded from the dataset. The data includes information about the level of income, education, experience, working hours, age, gender, regional and residential distribution and other personal characteristics. Unfortunately the data lacks information on sectoral diversity of the respondents as this variable was excluded from the dataset that is provided by National Statistic Committee (Belstat). Absence of this information might cause the problem of omitted variable bias and should be taken into account during the analysis.

### **Dependent variable**

The main variable of interest is the earnings' level of the respondents corrected by the country's PPI index using 2005 as the base year. This research takes a natural logarithm of monthly wages including other in-kind payments provided to the respondent as a main endogenous variable.

### **Independent variables**

The BHIES dataset allows getting information on various control variables that likely affect main variable of interest. First, this is a group of demographic characteristics including gender, marital status and age. Marital status is split into three categories: single, married and divorced or widowed. However, unfortunately the dataset does not contain clear diversification between categories. Therefore the paper is using proxies measured by household categories aimed at capturing the effect of family. As a result, single is measured in case the household type is indicated as a single. Married – in case the respondent denoted the household type as not single with two adults and kids and divorced/widowed – in case of one adult with kids. Information on number of children is also taken into account and is described by certain variables: quantity of children, children divided by different age groups, the interaction terms between children's quantity and age. The dataset also allows controlling for other individual

characteristics of the respondents including their number of working hours per month, years of working experience, educational attainment. The information of education is divided into 5 categories indicating the level of a background: university degree, completed technical or vocational school, usual secondary education and just a compulsory school. The data also covers information on regional and residential characteristics of the respondent. Thus dummies on districts are included into the regressions. Besides dummies denoting person's type of residence are applied indicating whether person lives in capital, large city, small town or rural area.

Figure 5 presents the structural composition of the sample of interest. According to the BHIES men form almost 46% of the dataset and women – 54%. The shares of men and women involved into the labor force are presented in Table 1. The numbers do not change much depending on gender, so that around 74.5% of working age men and 73% of women are actively involved into labor force. As for the women with children, the share of those who decided not to stay out of the labor market is even higher and equals to 75%.

The summary statistics for the whole sample is contained in Table 2. The sample is separated by gender and then women are also divided by motherhood status (Table 3).

The summary statistics demonstrates presence of significant difference between men and women that can be attributed to the majority of the characteristics. On average male wages a higher than female, so that the natural logarithm of average male monthly wages equals to 13.6 and females – 13.3. The kernel distribution of total monthly wages (Figure 6) shows the density of male and female employees at each point of wage distribution. The figure shows that the shape of the distribution of wage is similar across genders. However, the concentration of women at the bottom level of the distribution is higher, while the concentration of male wages is slightly farther to the left proving the presence of the gender wage gap in the labor market and that the average level of male wages exceeds female one.

Women in the population of interest are slightly older, so that men on average are 2 years younger. Women are more educated and the majority of women possess a university degree or a certificate of a completed technical school (53.8%) while just 39% of men are demonstrating similar level of qualification. At the same time there a slight signs of a male breadwinner model in the society, so that the share of married men is significantly higher (85% vs. 73%) as well as the average monthly hours spent at work (117.5 vs. 107.6).

The descriptive statistics of sub sample of mothers vs. non-mothers shows that women with children are less involved into the day-to-day activities in the labor market. So that on average they women without children spend around 117 hours at work per month while mothers just 105.8. As for the average level of earnings, the descriptive shows a significant gap in the natural logarithm of wages (13.55 vs. 13.2). Women without children are older and more experienced, while the level of educational attainment looks similar for both sub-groups. Around 30% of women have 1 child, 15% - two children and around 9.6% gave birth to three or more children.

## **5. Results**

The analysis starts with the estimation of typical Mincerian equation for men and women using an OLS technique (Table 4). The estimation procedure is done for the whole 2005-2014 dataset and controlled for the gender, timing and other exogenous factors' effect and then is estimated separately for men and women. The OLS results in the 1<sup>st</sup> specification are calculating the only gender effect on wages and thus show the unadjusted gender wage gap that equals to 30%. Inclusion of year dummies (specification 2) raises the obtained wage differential to 34.3% indicating the raising inequality in the labor market throughout time. Control for other influencing factors (specification 3) keeps the wage gap at the 30% level and shows the return on educational attainment as well as working experience, family status and various regional controls. Separate estimations for men and women (specifications 4 and 5) follow the literature (Dougherty, 2003; Verashchagina and Pastore, 2011; Pastore et al, 2013) and indicate that the returns on educational attainment are a higher for women compared with men. Experience positively affects the level of earnings of both men and women, while marital status has expected sign with a positive effect on male wages and no significant impact on females. Thus, it follows the research on the marriage premium that observes mostly premium for men (Loh, 1996; Chun and Lee, 2001; Breusch and Gray, 2004; Killlewald and Gough, 2013) without similar consistent results for women.

Earnings in the regions are lower compared with Minsk for both genders and do not contradict the statistical evidence. Same holds for the type of residence that affects the level of wages of both genders and follows the argument and statistics that earnings in the capital and urban area are higher compared with rural one.

In order to check whether the sample selection bias is an issue, the Heckman correction procedure is applied that helps analyzing the motives of joining the paid employment. The

results are described in the Table 5. Education appears to be one of the key factors positively affecting the decision to be actively involved into the labor market both for men and women. And the higher is the level of obtained educational attainment the larger is the propensity that person decides to go into the labor market. Similar effect holds for the amount of working experience. At that the relationship between the experience and willingness to be involved in to the labor force has an inverted U-shape like it is expected to be in the literature on human capital theory (Becker, 1964; Mincer, 1974; Rees and Shah, 1986).

Being married also raises the chances of male and female employment by 32% and 23% respectively. Surprisingly presence of children under 6 positively affects the employment decision of both men and women. The result is unexpected for women, but may be the result would change in case the 0-5 age group would be split into the infancy (0-2) and the pre-school (3-5) groups. Unfortunately the data lacks such precise information. At that, the quantity of children in the household has a negative impact of the employment propensity of women and insignificant effect in case of men.

The lambda is negative and significant both for men and women indicating the presence of sample selection. That is surprising taking into account the large share of involvement into active labor force. Thus, likely there are unobservable factors in the market that lead to underestimation of wages of both men and women. Similar findings were obtained for men in Georgia by Khitarishvili (2009) with an explanation that pressure of being breadwinner forces men to accept low paid job instead of looking for other better options.

### **The Return on Parenthood**

First, we estimate what is the impact of children on the level of wages (Table 6). The results of the first specification demonstrate that on average females with children receive around 14.4% less, while there is no sign of penalty in case of fatherhood and children do not have significant effect on male wages. The division of children by different age groups is presented in a specification (2) and shows that presence of children under 6 years old motivates men and leads to around 5% growth of their level of salaries, while the effect is tangibly opposite to women and diminishes their level of payment by around 46%. However, again, unfortunately it is not possible to divide between the children from 0 to 3 and from 3 to 6. The maternity leave in Belarus nowadays equals to 3 years and during this period of time women who are working part-time or staying at home are able to obtain the state allowance as a source of child support.

Thus, impossibility of separation between women with infants from 0 to 3 and women with children from 3 to 6 most likely overestimates the size of effect of children on wages and child penalty respectively. The wage penalty of children from older age groups is not huge, but the direction of effect in case of women is still negative and significant so that it decreases the level of wages by 6.3% and 8.2% respectively.

The effect of children on mothers with different educational backgrounds is presented in Table 7. First, the results show that the highest negative effect is observed in case of females with the university degree or higher, so that additional child decreases their level of wages by around 20%. Women with children who possess a degree from a technical or vocational school on average receive around 13% less, while the lowest (8%) wage penalty face mothers whose educational background is a secondary school or lower. These numbers basically follow the hypothesis introduced by Anderson et al. (2002) who claimed that the cost of going out of the labor market are higher for the qualified labor force compared with the low-skilled labor. As for the impact of different age groups of children on the wages of their mothers, again, children from 0 to 5 lead to the most serious drop in wages. At that, the scale of the effect follows the previous estimations, so that the most severe decline face high-qualified women, whose wages fall by around 50%. The potential explanation here is the higher level of the opportunity costs of the time spent at home taking care of children and not being involved into the labor activities. The deterioration in wages of women with a professional background is around 40%, while the wages of low-skilled women suffer around 37% decline. The older children have a less serious effect on the earnings of their mothers and the high-qualified women are still the main sufferers (minus 10% and 12% respectively because of children from 6 to 12 and above 12 respectively), while women with a secondary degree or lower do not demonstrate any significant decline in wages due to the presence of the older children in the household.

### **The Gender Pay Gap Decomposition**

First, the Oaxaca-Blinder technique is applied that allows decomposing the mean wage gap of male and female earnings (Table 8). This method splits the difference into three categories that are difference due to endowment, difference in prices and the unexplained part. It should be noted that the main weakness of this technique is the assumption of the linearity that might cause biasness of the estimation.

The decomposition results show that during the 2005-2014 the average level of women's salary formed 77% of male wages. At that around 107.5% of the overall wage gap for the 2005-2014 time period can be attributed to the difference in the coefficients, i.e. the way men and women use their characteristics and translate them into earnings. Thus, basically these are coefficients that explain the gender pay gap in the market. On average level of women's earnings diminishes the pay gap by around 15.4%. However, the effect of the coefficients is different throughout years meaning that in the 2005 women's characteristics outweighed men's, while in 2014 the picture became opposite and the gap increased not just due to the coefficients part, but also because of the characteristics effect. The unexplained part explains just the 8% of the wage gap, and its' share became lower throughout the time period.

Correction for sample selection impacts significantly on the size of the gender pay gap and increases the final estimates of the wage difference. The explanation of that issue is a presence of negative sample selection for both genders that underestimates the wages that should be higher in reality (Nicaise, 2001). At the same time the effect of underestimation of wages is higher for men compared with women. The direction of the effect of each of the component stays unchanged though.

The Oaxaca-Blinder decomposition allowed looking at the mean gap of male and female wages. However, it is not necessarily that the picture is similar all over the earnings' distribution. The Juhn, Murphy and Pierce technique also provides opportunity to decompose the wage difference and estimate the effect of endowments, coefficients and the unexplained residual part. However, it also measures not just the mean of the pay gap similar to Oaxaca-Blinder technique, but the difference at various percentiles of the earnings' distribution as well as allows measuring the dispersion of the gap between those percentiles. Table 9 presents the results of the decomposition for the 2005-2014 time periods. Similar to Oaxaca-Blinder decomposition, on average the major share of the wage gap is formed by the coefficients effect (88%). Thus, the way men translate their efforts and characteristics into earnings is providing significantly higher return compared with women. The women characteristics are explaining around 12% increase of the mean pay gap, while the effect is opposite in case of Oaxaca-Blinder decomposition presented in Table 8. The average unexplained component is almost negligible and equals to 0.1%.

The analysis of the average decomposition at different percentiles shows that the size of the pay gap is increasing from the bottom to the top of the distribution. So that it equals to 0.288 logarithmic points at the 5<sup>th</sup> percentile of earnings and amounts to 0.393 at the 95<sup>th</sup> percentile. The major role in the pay gap plays the coefficient component all over the distribution; the impact of the unexplained factor is growing from less than 1% in the bottom to almost 4% at the top. Finally, the analysis of wages dispersion in the distribution among the percentiles (Table 10) shows that that at the top 95<sup>th</sup> -50<sup>th</sup> percentiles the impact of characteristics is dominant and explains almost 44% of the gap, while the effect is opposite in the lowest 50<sup>th</sup> and 5<sup>th</sup> percentiles. The characteristics have decreasing impact for the lowest income groups, while the remuneration coefficients play the role of the major increaser of the pay gap. Thus, similar to Sierminska et al. (2008) the difference among earners of the low wages is mostly due to the coefficients and the way men and women translate their efforts into the return, while the difference in men-women characteristics is dominant in case of the high pay receivers. At that, the positive sign of the unobserved factors indicates that there are other unobserved characteristics that even though to a small extent, but positively affect the growth of the gender pay gap in the labor market. However, the dynamics of changes in the gender pay gap structure over time (Table 10) demonstrates certain interesting features. First, the growth rates of the pay gap among the lowest income groups were significantly higher compared with the highest percentiles. The gender pay gap of the 5<sup>th</sup> percentile grew from (-0.2 logarithmic points in 2005) to 0.71 in 2014, while its level in the highest income group (95<sup>th</sup> percentile) changed from 0.16 in 2005 to 0.35 in 2014. Moreover, despite that the average 2005-2014 level of the wage gap in the upper decile surpasses the average level in the lowest decile, the annual size of the pay gap is smaller at the highest income percentiles that likely might be explained by the higher level of qualification of both male and female employees located in this part of the income distribution. Next, we can see that similar to findings obtained by Gunalp et al. (2013) the role of the coefficients in explanation of the pay gap is higher in the top percentiles of income distribution meaning that probably the level of income of the poorest group just covers the subsistence level. The results also show that there are some unobserved characteristics that start positively affecting the level of female wages in 2014 and work on diminishing the overall gender pay gap among the highest income group.

Finally, the Machado-Mata decomposition method (Figure 7 and Figure 8) followed the results obtained by the JMP decomposition that during the 2005-2014 time period the gender pay gap

increased all over the wage distribution (Figure 7). However, the size of the gap is higher at the top percentiles of wage earners. Mostly the gap is explained by the coefficients part, while the role of the characteristics is different depending on the income group. The comparison of results separately for the 2005, 2010 and 2014 years (Figure 8) partly duplicates the JMP decomposition presented in Table 8, so that a significant shift in impact of characteristics occurred in the bottom of earnings distribution. In 2005 it mostly led to the reduction of the gap while in 2010 and 2014 the effect became opposite for the low-income groups, so that both characteristics and the difference in coefficients led to the growth of the gender pay gap. Moreover, the evidence suggests that the productivity and commitment of low-pay female employees fell significantly during the 2005-2014 time period and resulted in a significant growth of the gender wage gap. As for the higher income groups, the shift in impact of personal characteristics also occurred but without such tangible changes. This follows the results obtained by Verashchagina and Pastore (2011) who claimed that the transition period did not led to drop in participation rate of Belarusian female workers at the labor market like it happened in other countries in transition but mostly affected their loyalty, dedication and responsibility at work. As for the impact of the coefficients and the way men and women transform actions into money, it has not changed much and keeps being the main factor that causes the presence of the pay gap. Unfortunately the absence of the data on sectoral distribution of men and women does not allow making more precise estimations that likely will shift the accents and shed more light on the peculiarities of the labor market in Belarus.

Altogether all of the applied decomposing methods (Oaxaca-Blinder, Juhn-Murphy-Pierce, Machado-Mata) confirm the major part of the gender wage gap is due to the difference in the coefficients and the way men and women transform their characteristics into the return, which is likely the sign either of the discrimination on the market or the segregation effect. So that due to the obligations at home likely women are choosing the industries that provide more flexible working conditions on the one hand but accompanied with lower payment on the other. Unfortunately the data does not allow prove that statements and that is one of the drawbacks of the research that should be kept in mind. The unexplained part is almost negligible in all three methods applied indicating that there are no signs of present unobserved actors that diminish remuneration of women in the market compared with men. The wage gap across income distribution is different and is growing at the top percentiles of the wages distribution. Both endowment and price effect are positively affecting the growth of the wage

gap. Thus, women are facing some disadvantages both in terms of their personal characteristics that impact on the remuneration as well as the way they are priced compared with men.

## **6. Conclusions**

Even after 25 years since the collapse of the Soviet Union, Belarus is still on its way toward the market economy and goes through the transformation process that possesses certain peculiarities. The state sector keeps playing the significant role in the economy and affects the overall level of employment preventing the labor force from becoming unemployed. As a result, the share of females actively involved into the labor market keeps being around 83% and is higher than males' involvement that is balancing at around 76%. However, at the same time despite more active involvement of women, the level of male wages rose faster and as a result the gender pay gap grew by around 2.5 times since the beginning of 2000s.

This paper addressed certain issues related to the gender differences in the labor market of Belarus. It looked at the reasons of the gender wage gap in the market. In addition it checked for the return on marriage by gender and investigated the presence of the childhood penalty. The analysis is performed on the basis of the 2005-2014 Belarusian Household Income and Expenditure Survey (BHSIE). The gender wage gap analysis was estimated using OB, JMP and MM decomposition techniques that allowed looking into details from different perspectives. One of the obstacles to the analysis is the absence of information on sectoral distribution that prevents from checking for the impact of market segregation on the difference in earnings.

The results of the Oaxaca-Blinder decomposition showed that the gender pay gap is due to differences in the coefficients, i.e. the way men and women are translating their efforts into the pecuniary benefits. The direction of the factors affecting the difference in remuneration is similar with or without control for sample selection. The size of the gap is larger after controlling for selectivity. The drawback of the OB method is its' orientation on the analysis at means and inability of looking all over the income distribution. The JMP and MM methods demonstrate that on average the pay gap on top is higher than at the bottom, but the 2005-2014 growth rates of the pay gap at the lowest percentiles were much more impressive than at the top of the distribution. The direction and strength of impact of personal characteristics on the difference in earnings varies all over the wealth distribution and time. In the middle of 2000s the characteristics worked on reduction of the pay gap, however, later on the effect became opposite, especially in case of the lowest income group. Thus, the results follow

Verashchagina and Pastore (2011) who showed that transition period in Belarus did not cause the decline in the participation rates of women but affected their motives and commitment. Unfortunately, the absence of the sectoral data does not allow checking for the intra-market movements of women to the low-paid service sector jobs like it was observed in 2000-2006 (Verashchagina and Pastore, 2011).

The paper also provided evidence on positive relationship between marriage and male wages. The analysis showed presence of 10.5% premium in case of men, which is consistent with the literature, while no significant effect for women was observed. Thus, these results follow the idea of the breadwinner theory. Married males are feeling responsible for their families and motivated to work more in order to provide the sustainable level of living for other members. At the same time absence of the premium in case of women are signaling in some way that women have to be actively involved not only in the household activities but the labor market as having only one breadwinner in the household is not enough under current economic conditions in the country.

Finally, the analysis of the childbearing penalty showed that this statement does not hold in case of men, and oppositely, presence of children from 0 to 5 raises male wages by around 5%, while the effect is negative and significant in case of women. On average having a child diminishes female wages by around 14.4%. The analysis also shows that the wage penalty is different depending on the age group of a child as well as the educational background of women. Children from 0 to 5 have the most severe decreasing effect and diminish female wages by around 46%, while children from 6 to 12 and over 12 reduce wages by 6% and 8% respectively. However, such a significant and tangible effect of children from 0 to 6 is possibly due to inability of exclusion of women with children from 0 to 3, when the majority of mothers are staying at home or working part-time. Therefore, this might result in the overestimation of the size of child penalty on the level of remuneration. Women with the university degree or higher suffer the most and face the highest level of penalty. This finding goes in line with the previous results (Anderson et al., 2002) that showed that the opportunity costs of staying at home instead of going into the labor market are in direct and positive relationship with the level of qualification and educational attainment of women.

All these findings together demonstrate that there are serious issues to be solved in the labor market. The efforts of the authorities aimed at boosting the overall fertility level are

accompanied by the rising gender wage gap in the market. At the same time the level of the wage penalty due to the childbearing works as a serious disincentive from joining motherhood, especially in case of the highly educated women. As a result, women have to face additional burden in terms of choosing either being less committed and effective at work, choosing the less-attractive job or delaying childbearing. Thus, it is vital to introduce other initiatives that will stimulate the growth of population on the one hand and work on diminishing the gender inequality on the other.

First, actions on infrastructure improvement, introduction of a larger number of childcare facilities as well as upgrade of the quality of their services might have a positive effect in both directions (the growth of fertility and reduction of inequality). Second, provision of obligatory parental leave to both partners, expansion and strengthening of the male role in child rearing. The experience of the Scandinavian countries showed that such initiative upgrades the involvement of males in the day-to-day family activities as well as improves situation of females in the labor market by making them less vulnerable in front of the potential employers.

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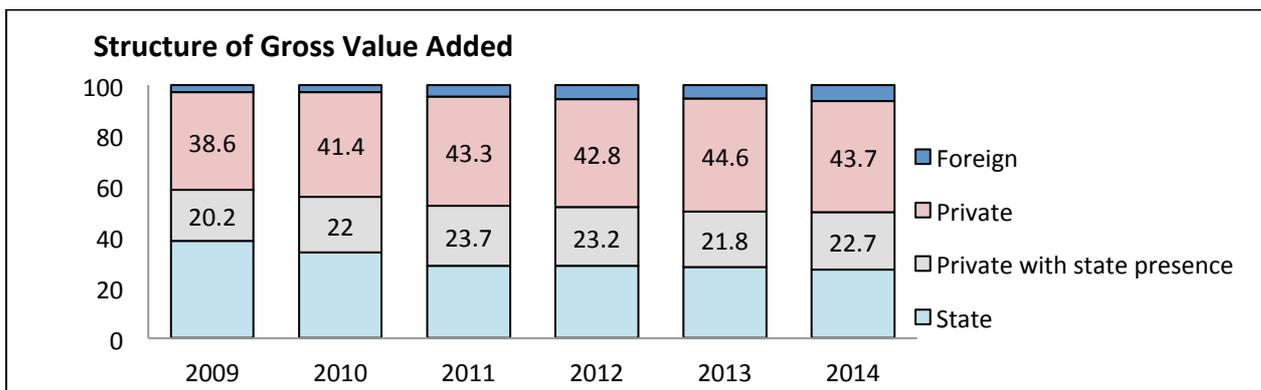
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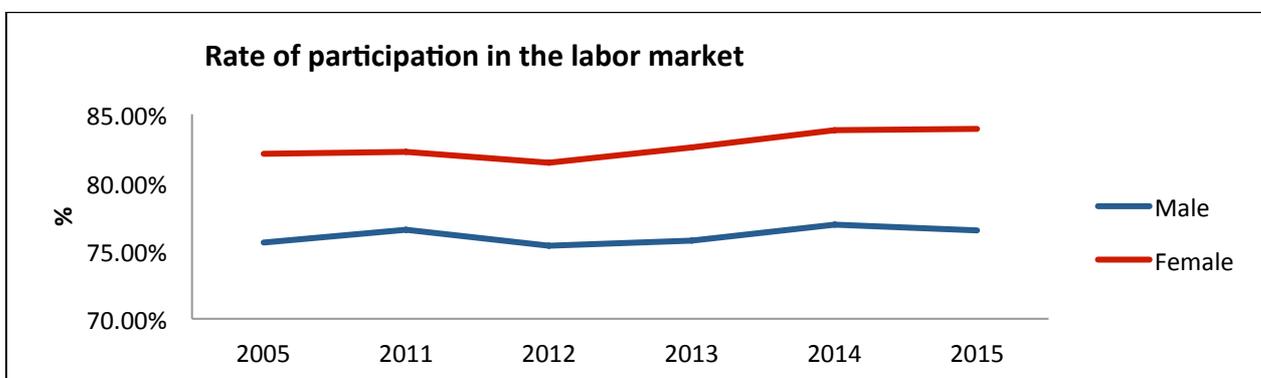
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Figure 1. Gross value added by ownership structure



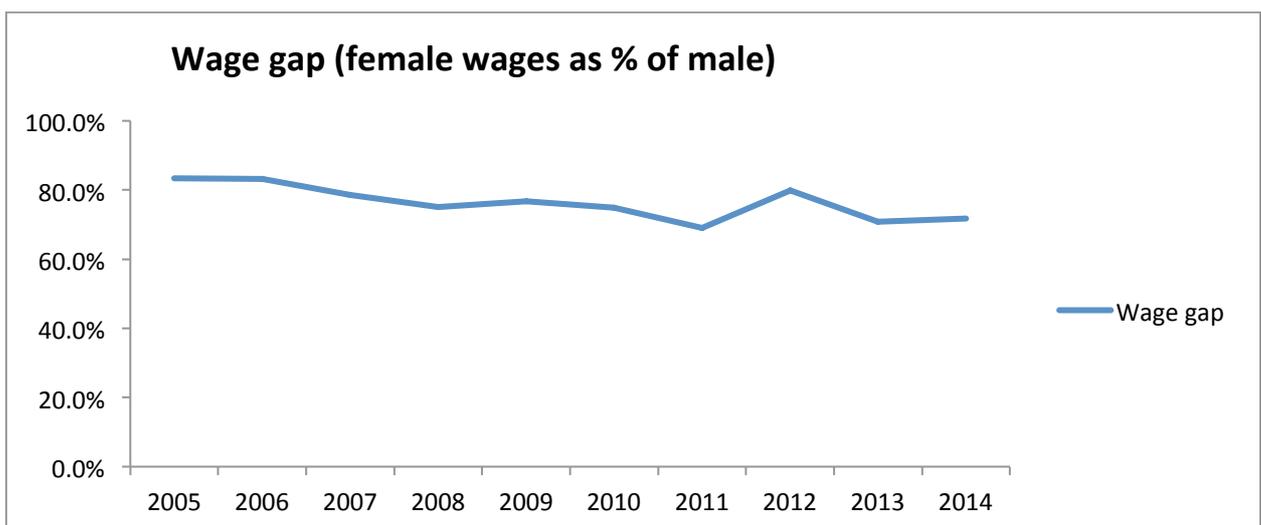
Source: BELSTAT

Figure 2. Participation in the labor market by gender



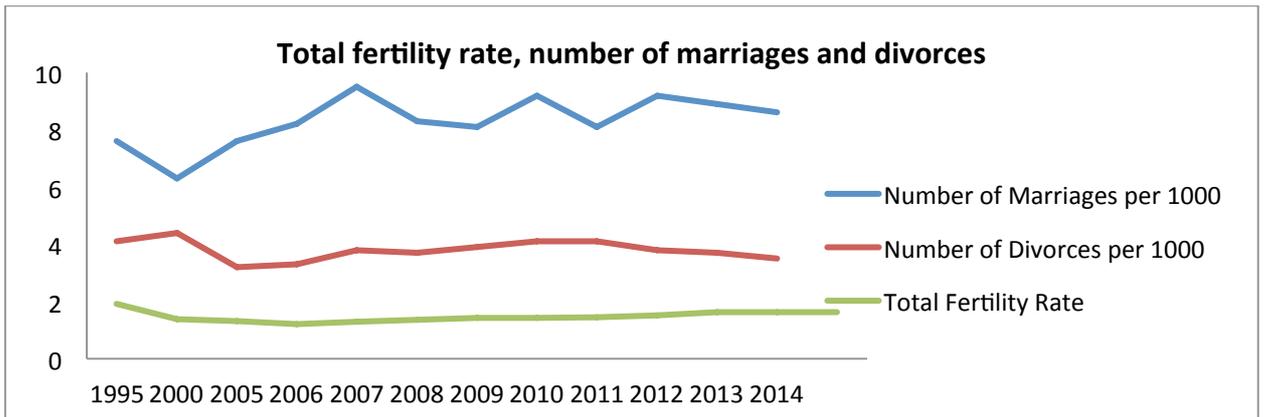
Source: BELSTAT

Figure 3. Gender wage gap



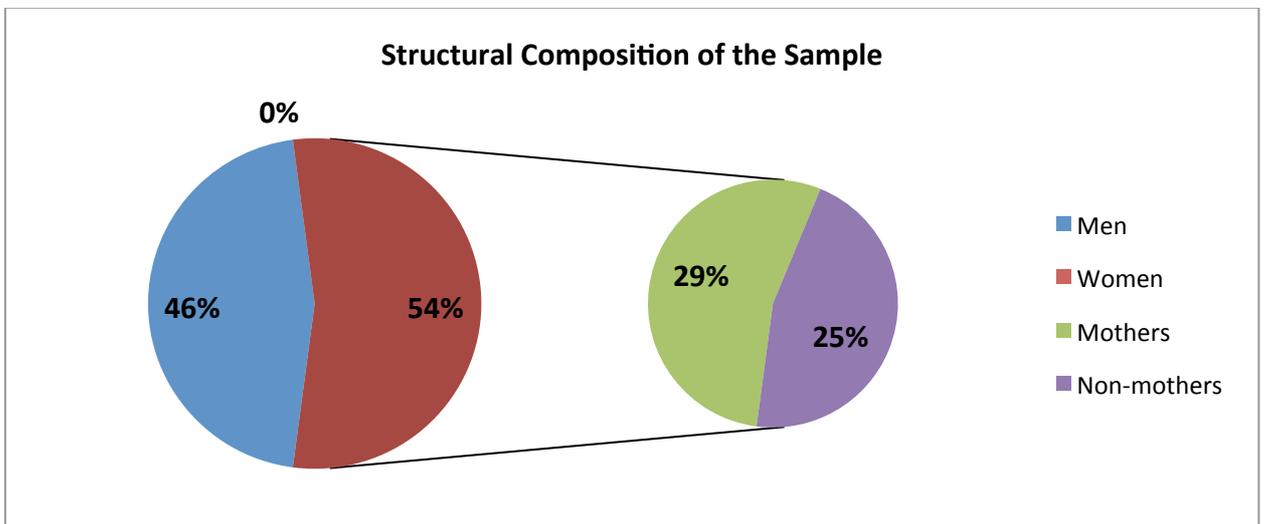
Source: BHSIE

Figure 4. Total fertility rate (per woman) and number of marriages and divorces (per 1000)



Source: BELSTAT

Figure 5. Structural composition of the sample



Source: BHIES

Table 1. Structural composition of the population

	Employed	In the labor force
Men	65.20%	74.50%
Women	62.40%	72.90%
Mothers	64.40%	75.30%

Source: BHIES

Table 2. Summary statistics by gender

Source: BHIES

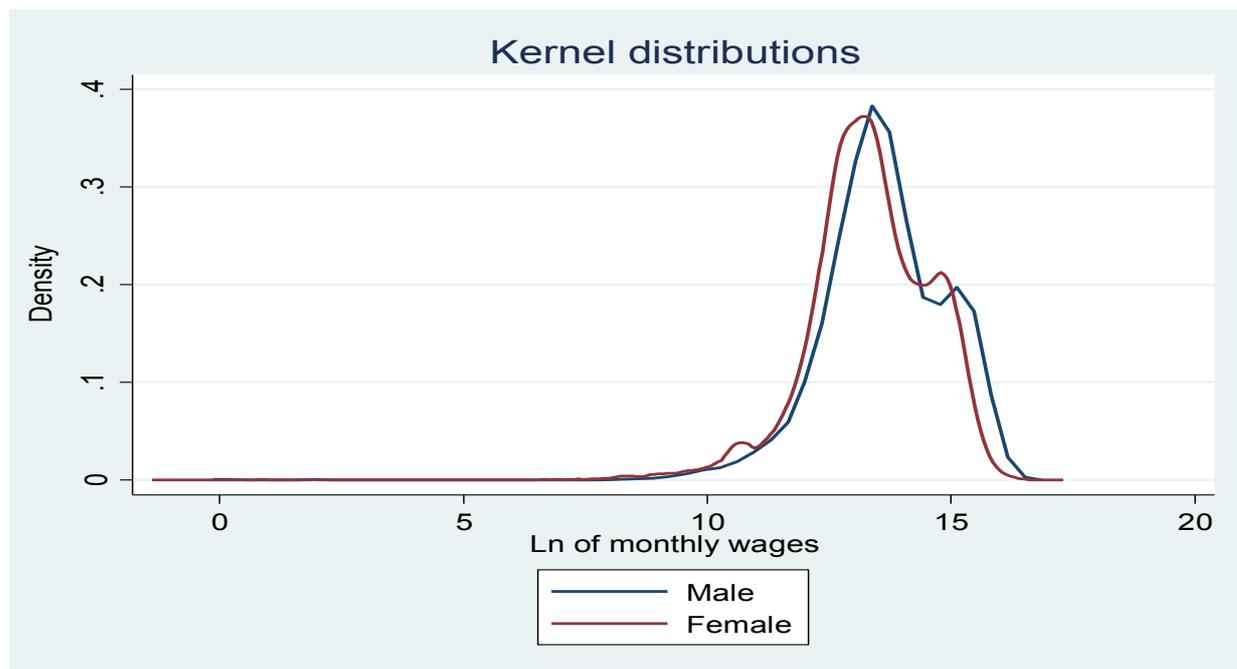
	Men					Women					Gap
	Mean	Std. Dev.	Min	Max	N	Mean	Std. Dev.	Min	Max	N	
Ln of monthly wages	13.558	1.362	-0.663	17.18	17185	13.254	1.351	-0.921	16.917	20809	0.226 ***
Monthly hours	117.542	74.437	0	172	22372	107.614	77.054	0	172	28789	5.541 **
Ln of other income	13.734	1.580	-22.925	18.81	20329	13.685	1.987	-24.311	17.805	26261	0.045 *
Years of education	11.376	4.03	0	16	22372	12.194	3.5160	0	16	28789	-0.736 ***
University degree or higher	0.166	0.371	0	1	22372	0.222	0.415	0	1	28789	-0.054 **
Technical school	0.230	0.421	0	1	22372	0.317	0.465	0	1	28789	-0.095 **
Vocational school	0.231	0.421	0	1	22372	0.171	0.376	0	1	28789	0.070 **
Secondary school	0.205	0.404	0	1	22372	0.176	0.395	0	1	28789	0.033 **
Compulsory school	0.079	0.271	0	1	22372	0.055	0.228	0	1	28789	0.016 **
Age	35.256	11.539	16	60	22372	39.154	12.773	16	60	28789	-1.469 *
Working experience	17.88	10.486	0	54	22372	20.925	12.026	0	54	28789	-0.733 *
Married	0.852	0.355	0	1	22372	0.733	0.442	0	1	28789	0.097 ***
Divorced or widower	0.047	0.212	0	1	22372	0.057	0.231	0	1	51596	-0.033 *
Number of children	1.358	0.820	0	8	22199	0.749	0.889	0	8	48498	0.008
Children of 0 to 5 year	0.356	0.479	0	1	22372	0.243	0.429	0	1	51596	0.003
Children of 6 to 12 year	0.389	0.487	0	1	22372	0.262	0.440	0	1	51596	0.001
Children of 13 or above	0.423	0.494	0	1	22372	0.289	0.453	0	1	51596	0.006 *
Elder than 60 in the household	0.237	0.425	0	1	43608	0.247	0.431	0	1	51596	-0.010 *
Brest region	0.163	0.369	0	1	43608	0.157	0.363	0	1	51596	0.006 *
Vitebsk region	0.139	0.346	0	1	43608	0.140	0.347	0	1	51596	-0.001
Gomel region	0.153	0.360	0	1	43608	0.154	0.361	0	1	51596	-0.001
Grodno region	0.126	0.332	0	1	43608	0.124	0.330	0	1	51596	0.002
Minsk region	0.155	0.361	0	1	43608	0.151	0.358	0	1	51596	0.004
Mogilev region	0.118	0.322	0	1	43608	0.121	0.326	0	1	51596	-0.003
Minsk city	0.146	0.354	0	1	43608	0.154	0.361	0	1	51596	-0.007 *
Large city	0.278	0.448	0	1	43608	0.294	0.456	0	1	51596	-0.016 *
Small town	0.235	0.424	0	1	43608	0.240	0.427	0	1	51596	-0.005
Rural area	0.340	0.474	0	1	43608	0.311	0.463	0	1	51596	0.029 *
Poor health quality	0.035	0.183	0	1	43608	0.039	0.193	0	1	51596	-0.004 *

Table 3. Summary statistics for women by child bearing status

	Non-Mothers					Mothers					Gap	
	Mean	Std. Dev.	Min	Max	N	Mean	Std. Dev.	Min	Max	N		
Ln of monthly wages	13.552	1.345	-0.663	17.17	20746	13.199	1.355	-0.921	16.917	17248	0.352	***
Monthly hours	117.41	73.608	0	172	27116	105.805	77.325	0	172	24045	11.605	***
Ln of other income	13.588	1.943	-24.311	18.550	21198.000	13.929	1.554	-24.311	17.805	23698	-0.341	***
Years of education	12.402	3.076	0	16	23680	12.083	3.612	0	16	27916	0.319	**
University degree or higher	0.211	0.408	0	1	23680	0.215	0.411	0	1	27916	-0.004	
Technical school	0.342	0.474	0	1	23680	0.311	0.463	0	1	27916	0.031	*
Vocational school	0.154	0.361	0	1	23680	0.173	0.378	0	1	27916	-0.018	*
Secondary school	0.214	0.410	0	1	23680	0.176	0.381	0	1	27916	0.038	**
Compulsory school	0.042	0.200	0	1	23680	0.066	0.249	0	1	27916	-0.025	**
Age	43.529	12.972	16	60	23680	35.443	11.349	16	60	27916	8.086	***
Working experience	25.127	12.373	0	54	23680	17.360	10.477	0	54	27916	7.767	***
Married	0.005	0.068	0	1	23680	0.777	0.416	0	1	27916	-0.772	***
Divorced or widower	0.000	0.009	0	1	23680	0.106	0.307	0	1	27916	-0.105	***
Elder than 60 in the household	0.282	0.450	0	1	23680	0.217	0.412	0	1	27916	0.065	**
Brest region	0.150	0.357	0	1	23680	0.162	0.369	0	1	27916	-0.013	*
Vitebsk region	0.142	0.349	0	1	23680	0.139	0.346	0	1	27916	0.004	
Gomel region	0.155	0.362	0	1	23680	0.153	0.360	0	1	27916	0.002	
Grodno region	0.131	0.337	0	1	23680	0.118	0.323	0	1	27916	0.012	*
Minsk region	0.153	0.360	0	1	23680	0.149	0.356	0	1	27916	0.003	
Mogilev region	0.117	0.322	0	1	23680	0.124	0.329	0	1	27916	-0.007	*
Minsk city	0.153	0.360	0	1	23680	0.155	0.362	0	1	27916	-0.002	
Large city	0.294	0.456	0	1	23680	0.295	0.456	0	1	27916	-0.001	
Small town	0.244	0.430	0	1	23680	0.237	0.425	0	1	27916	0.007	
Rural area	0.309	0.462	0	1	23680	0.313	0.464	0	1	27916	-0.004	
Poor health quality	0.050	0.218	0	1	23680	0.029	0.167	0	1	27916	0.022	**

Source: BHIES

Figure 6. Estimates of kernel distributions for monthly wages by gender



Source: BHIES

Table 4. Mincerian wage equation (OLS)

VARIABLES	Gender	Gender and years	All	Men	Women
University degree or higher			0.426***	0.336***	0.492***
Technical school			0.152***	0.126***	0.171***
Vocational school			0.0385***	0.0403***	0.0338***
Compulsory school			-0.134***	-0.162***	-0.0804***
Divorced/Widowed			0.0208	0.0633	0.0111
Married			0.0235*	0.105***	-0.0169
Ln (monthly working hours)			1.279***	1.306***	1.256***
Experience			0.0219***	0.0240***	0.0200***
Experience^2			-0.00051***	-0.000601***	-0.000436***
Brest region			-0.0914***	-0.109***	-0.0743***
Vitebsk region			-0.0827***	-0.0618***	-0.0960***
Gomel region			-0.0967***	-0.0704***	-0.115***
Grodno region			-0.102***	-0.110***	-0.0929***
Mogilev region			-0.166***	-0.218***	-0.120***
Small town			-0.187***	-0.190***	-0.185***
Large city			-0.10***	-0.0776***	-0.119***
Rural area			-0.306***	-0.379***	-0.243***
Year dummies	no	yes	yes	yes	yes
Female	-0.304***	-0.343***	-0.306***		
Constant	13.56***	12.53***	6.196***	6.004***	6.035***
Observations	37994	37994	37797	17184	20613
R-squared	0.012	0.522	0.821	0.804	0.837

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 5. Heckman corrected Mincerian wage equation

VARIABLES	Men			Women		
	Wage equation	Selection equation		Wage equation	Selection equation	
University degree or higher	0.192***	1.495***		0.440***	1.353***	
Technical school	0.00804	1.281***		0.142***	0.993***	
Vocational school	-0.0566**	1.101***		0.00663	0.827***	
Compulsor yschool	-0.101***	-0.240***		-0.0533	-0.325***	
Divorsed/Widowed	0.0729	-0.319***		0.0334*	0.288***	
Married	0.195***	0.323***		0.0100	0.228***	
Ln (monthly working hours)	1.314***			1.231***		
Experience	0.0116***	0.116***		0.0115***	0.176***	
Experience^2	-0.00035***	-0.0022***		-0.00023***	-0.0039***	
Brest region	-0.110***			-0.0705***		
Vitebsk region	-0.0672***			-0.0803***		
Gomel region	-0.0804***			-0.119***		
Grodno region	-0.109***			-0.0948***		
Mogilev region	-0.224***			-0.119***		
Small town	-0.188***			-0.173***		
Large city	-0.0751***			-0.111***		
Rural area	-0.386***			-0.230***		
Year dummies yes				yes		
Number of children Children of age from 0 to 5		-0.0188			-0.122***	
Family members over 60		0.358***			0.140*	
Ln (other monthly income)		-0.196***			-0.196***	
Poor health quality		-0.0801***			-0.0617***	
Lambda		-1.194***	-0.234***		-0.825***	
Constant	6.100***	-0.314**		6.221***	-0.635***	-0.096**
Observations	19092	19092	19092	23669	23669	23669

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 6. Estimates of return on parenthood

	1		2	
	men	women	men	women
Number of children Children from 0 to 5	0.00323	-0.144***	0.050***	-0.46***
Children from 6 to 12			0.0068	-0.063***
Children over 12			-0.02	-0.083***
Observations	19121	23891	19121	23891

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 7. Estimates of motherhood penalty by education

	1	2	3	4	5	6
VARIABLES	University	Professional school	High school	University	Professional school	High school
Number of children	-0.204***	-0.134***	-0.0796***			
Children from 0 to 5				-0.507***	-0.404***	-0.369***
Children from 6 to 12				-0.0989**	-0.0661***	-0.0171
Children over 12				-0.117**	-0.0809***	-0.0429
Observations	4924	11520	5887	4924	11520	5887

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 8. Three-fold decomposition results (OAXACA)

	OLS technique				Corrected for selectivity (Heckman)			
	Total	Characteristics	Coefficients	Unexplained	Total	Characteristics	Coefficients	Unexplained
2005-2014								
male	13.524				13.575			
female	13.258				13.273			
	0.2664	-0.04095	0.2863	0.0210	0.303	-0.007	0.2662	0.0435587
		-15.4%	107.5%	7.9%		-2.3%	87.9%	14.4%
2014								
male	15.565				15.673			
female	15.159				15.221			
	0.4057	0.0095	0.3634579	0.0327	0.4519	0.0517	0.344	0.057
		2.3%	89.6%	8.1%		11.4%	76.1%	12.5%
2010								
male	13.394				13.466			
female	13.069				13.111			
	0.3244	-0.0076	0.3078	0.0241	0.2422	0.0148	0.3114	0.028
		-2.3%	94.9%	7.4%		6.1%	128.6%	11.6%
2005								
male	12.406				12.285			
female	12.312				12.233			
	0.0935	-0.1411259	0.2170076	0.0175936	0.0522	-0.164	0.1915	0.024
		-151.0%	232.2%	18.8%		-313.3%	366.7%	46.6%

Men as the reference group

Table 9. Three-fold decomposition results (Juhn, Murphy, Pierce) across the payment distribution

2005-2014	Totalgap	Characteristics	Coefficients	Residualgap
p5	0.2877	0.0631 21.9%	0.2223 77.3%	0.0023 0.8%
p25	0.2526	0.0009 0.4%	0.2508 99.3%	0.0008 0.3%
p50	0.3027	0.0361 11.9%	0.2662 87.9%	0.0004 0.1%
p75	0.3596	0.0437 12.1%	0.3078 85.6%	0.0082 2.3%
p95	0.3937	0.0758 19.2%	0.3044 77.3%	0.0135 3.4%
p95-p5	0.1060	0.0127 11.9%	0.0821 77.5%	0.0112 10.6%
p95-p50	0.0910	0.0396 43.5%	0.0382 42.0%	0.0131 14.4%
p50-p5	0.0150	-0.0270 -179.8%	0.0439 292.5%	-0.0019 -12.7%
p75-p25	0.1071	0.0427 39.9%	0.0570 53.2%	0.0074 6.9%

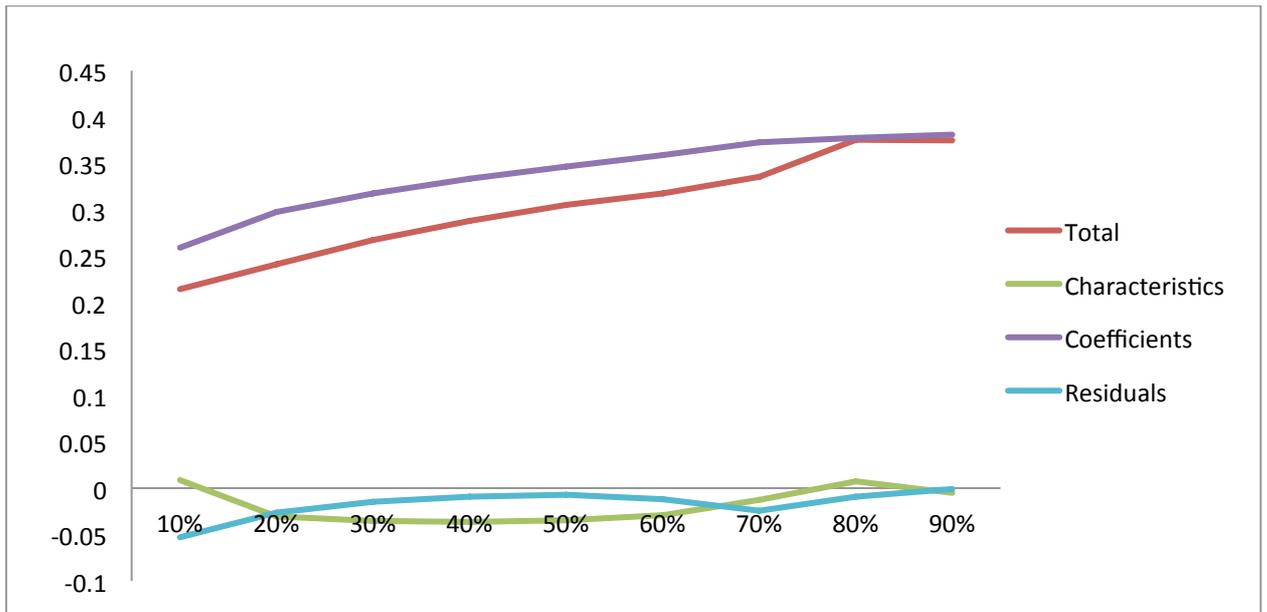
Men as the reference group

Table 10. Decomposition Three-fold decomposition results (Juhn, Murphy, Pierce) across the payment distribution (2005, 2010, 2014)

		Total gap	Characteristics	Coefficients	Residuals
2005	p5	-0.2030	-0.4134	0.2427	-0.0323
	p25	-0.0100	-0.1571	0.1762	-0.0292
	p50	0.1108	-0.0796	0.1814	0.0090
	p75	0.1517	-0.0639	0.1900	0.0256
	p95	0.1610	-0.0450	0.1582	0.0479
2010	p5	0.4958	0.1524	0.3449	-0.0014
	p25	0.3794	0.0580	0.3384	-0.0169
	p50	0.3337	0.0176	0.3066	0.0095
	p75	0.3410	0.0270	0.3078	0.0061
	p95	0.3230	-0.0061	0.3264	0.0027
2014	p5	0.7059	0.4760	0.2597	-0.0297
	p25	0.4683	0.0862	0.3625	0.0195
	p50	0.4321	0.0842	0.3503	-0.0024
	p75	0.3822	0.0322	0.3650	-0.0149
	p95	0.3490	0.0418	0.3534	-0.0462

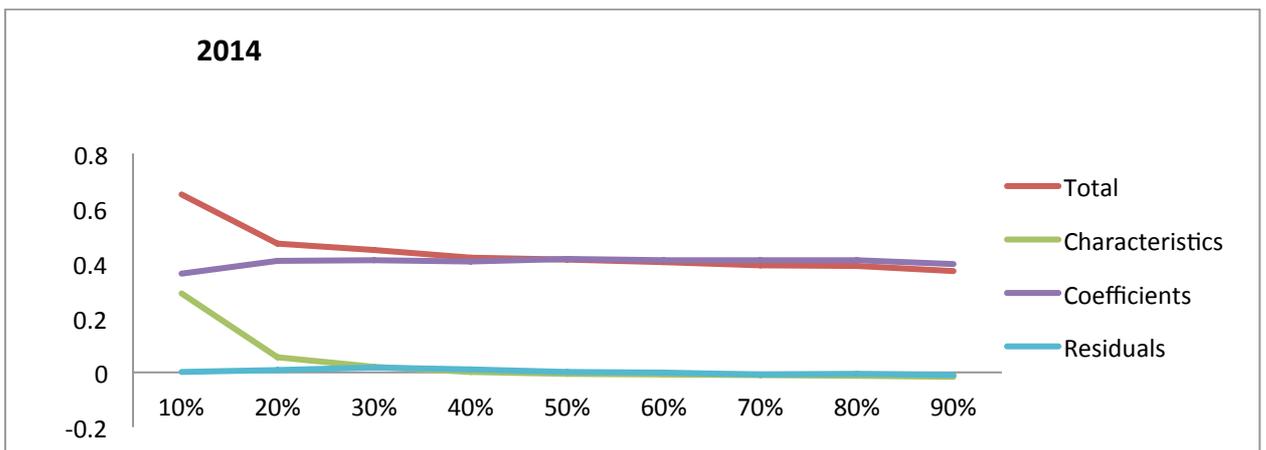
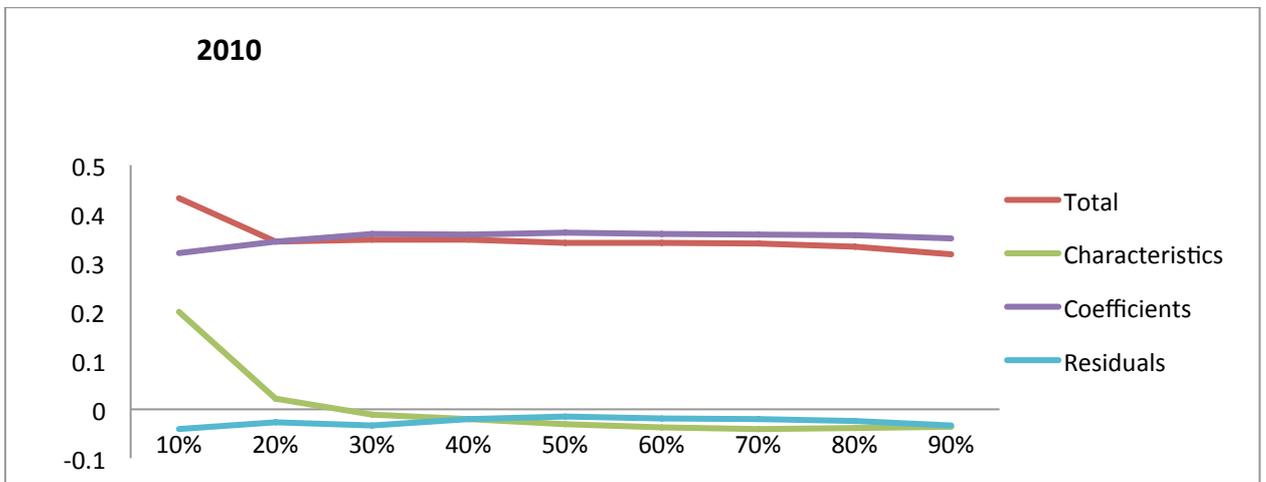
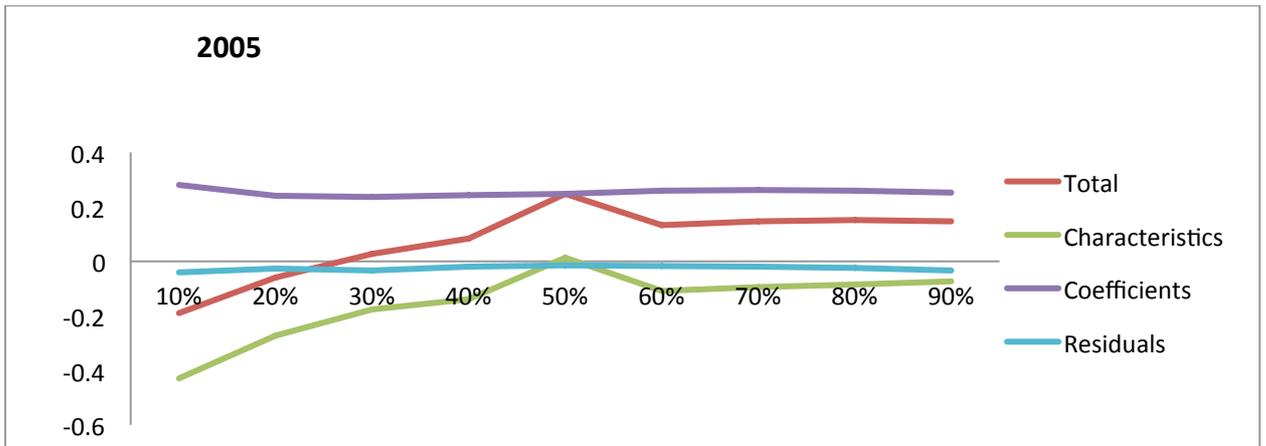
Men as the reference group

Figure 7. Three-fold decomposition results (Machado-Mata) across the payment distribution (2005-2014)



Men as the reference group

Figure 8. Three-fold decomposition results (Machado-Mata) across the payment distribution (2005, 2010 and 2014)



Men as the reference group