
Parenthood Impact on Wage Gap in Romania

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ABSTRACT

Discrimination is a phenomenon of impacting significance for policy makers because it affects all social classes and generates inequalities and lack of opportunities. This study uses R statistical software to analyse wage differences based on parenthood and maternity criteria. Blinder-Oaxaca econometrical model is selected along with a linear regression technique to be performed. The study suggests that the impact of the presence of children is a contributing factor to the general inequality between people. This relationship complies with the decreasing natality trend.

Keywords: *Blinder-Oaxaca, wage gap, salary statistics, maternity*

INTRODUCTION

Social discrimination has many forms and the most impacting are the ones starting by race (Glăvan et al., 2016a; Andrei et al., 2017), gender, age and maternity as shown in the recent scientific advances (Kleven et al., 2018). The present study aims to present the most important aspects revealed by the Blinder-Oaxaca analysis models on the existing inequality patterns between men and women based on maternity and paternity criteria in Romania. The study uses R software with Hlavac's 2018 version of the *oaxaca* package (Hlavac, 2018). R software is known to be the most powerful tool available in data science field, as its use has increased significantly being far ahead in specialised alternative choice from IBM SPSS and SAS software (Rexer, 2015). With its high availability and flexibility, better performing than EViews, IBM SPSS and SAS with different statistical methods and implementations, R delivers with better formats and superior graphical outputs.

Wage differences between men and women are closely related by the industry affiliation and the professional trajectory taken by women, because of the education and the impact that is shown in their natural development. Such criterion of high significance is the birth of children. This aspect as shown in many researches (Hill, 1979; Anderson et al., 2002; Oesch et al., 2017) creates a phenomenon that manifests distinctly between the two groups, better described by the following, motherhood penalty and fatherhood premium, used frequently to address it.

Though this effect on having children is positive for the wages of men and reversely seen on the wages of women, hidden characteristics that affect this correlation pattern are important to reveal the magnitude of the causes that generated such inequalities. These aspects profoundly lay terms to the decision that having children generates obstacles in the career of the ones naturally gifted to give birth. This phenomenon is seen in all societies where equal rights are of fundamental value.

Nevertheless, a recent study on this issue of great importance in the Romanian society

(Zamfir, 2014) points to the idea of being “an active parent”. This translates to inequality effects on the labour market. In this context, the present study firstly introduces the importance of maternity in the wage gap. Second, Blinder-Oaxaca methodology is further described considering the recent advances in R statistical tools.

Third, an analysis is performed in order to investigate the hidden patterns of the wage gap between men and women with or without children, in Romania with recent micro data. Finally, conclusions and further proposals for future research are stated.

DATA SETS

The dataset that is selected to be used in the performed analysis is available from the European Working Conditions Survey (EWCS 2015) performed by Eurofound (2017). The survey is representative for the current study because it describes the image of the labour market considering individual characteristics of the respondents, such as gender, age, occupations and activity sectors of the economy.

The subset for Romania used in this study contains only characteristics about employed work force, aged between 15-65 for men and 15-63 for women. Furthermore, the dataset that is used does not contain self-employed and agricultural workers.

The study investigates wage differences between following groups: women with and without children, men with and without children. A parent is considered any individual that takes care of at least one child aged of 14 years or less (ILO, 1990). The performed analysis in this study uses the following defining variables: parent, presence of children aged 3 years or less, forms a couple, age, experience squared, urban area, years of education, private sector of activity. Number of years in school is associated with the highest level of education achieved, excluding the failed years of school. Experience in this case is defined as the difference between the age and the

years spent in school. The dependent variable used is the natural logarithm of wage.

BLINDER-OAXACA METHODOLOGY IN R

The methodology in the current paperwork uses Blinder-Oaxaca technique to decompose mean differences in wages in an analysis based on a linear regression model. This part of the study brings forwards the principles that lay down at the estimation method throughout the proposed analysis. In their study Blinder and Oaxaca (1973) highlighted the existing discrimination on the labour market with their method of procedure by decomposing the outcome variables in explained variance component and unexplained one. The procedure decomposes the difference in average earnings between groups of people into a component part named endowments, related to the specific characteristics, and an unexplained part which is the residual component. The unexplained part is to be interpreted as the discrimination component or it may be regarded as the effects created by the unobserved characteristics. The three-fold variant of the Blinder-Oaxaca selected for use is described as following. Thus, our two groups of interest are A and B , and the research is done to understand how much of the mean of (log) wage difference (Y) is due to the differences in the characteristics of the two types of population.

$$D = E(Y_A) - E(Y_B) \tag{1}$$

For each group of population, it can be estimated a linear model for wage determination:

$$Y_A = \beta_A X_A - \varepsilon_A \tag{2}$$

$$Y_B = \beta_B X_B - \varepsilon_N \tag{3}$$

X_B and X_A are vectors containing the characteristics for the groups of people. The β contains the slope values and the intercept; ε contains the error related term. Further $E(\beta_A) = \beta_A$, $E(\beta_B) = \beta_B$ and $E(\varepsilon_A) = E(\varepsilon_N) = \mathbf{0}$. Thus, equation (1) may be rewritten as following:

$$D = E(Y_A) - E(Y_B) = \beta_A E(X_A)' - \beta_B E(X_B)' \tag{4}$$

To determine and identify the contributions, of the people's characteristics from each of the two groups, see also Jones & Kelly (1984) and Daymont & Andrisani (1984), to the overall wage difference equation

(4) may be re-arranged as following to reveal the wage gap decomposition in three components:

$$D = \underbrace{(X_A - X_B)\beta_B}_{\text{endowments}} + \underbrace{E(X_B)'(\beta_A - \beta_B)}_{\text{coefficients}} + \underbrace{(E(X_A) - E(X_B))'(\beta_A - \beta_B)}_{\text{interaction}} \quad (5)$$

In this case such three-fold decomposition, as shown in Equation (5) achieves the isolation of the contribution to fitted wage disparity in three terms. The first term reveals the contribution of the group differences in the related analysed characteristics (predictors) across the two categories of people creating the “endowments effect”. Therefore, the endowments term measures the expected change in group B’s mean outcome if this group had same predictor levels as group A. Second addendum measures the group differences in the coefficients including in the intercept and the third term, interaction, explains that there may exist cross-differences between groups simultaneously in the explanatory variables and in the coefficients. The differences in the coefficients are weighted by the predictor levels of group B, thus concluding that the second term is measuring the expected change in mean outcome if group B had the coefficients of group A.

To ensure that the obtained results using such method of procedure are invariant of the choice of the omitted baseline category, the procedure in R package accounts also for the proposed changes suggested by Gardeazabal and Ugidos (2004).

I selected Jann’s variation of the Blinder-Oaxaca methodology because it uses coefficient estimates from a regression that pools observations from both groups and includes the group indicator variable as an additional regressor in order to minimize distortions in the decomposition results because of the residual group difference spilling over into the slope parameters of the pooled model (Jann, 2008).

PARENTHOOD DECOMPOSITION AND RECENT ADVANCES FOR ROMANIA

To evaluate the parenthood wage gap between selected groups an OLS estimation is performed. The motherhood wage gap results presented in Table 1 indicate that mother’s wages are with 5.2% less compared to their counterparts. On the other hand, men with children earn with 2% more, but in this case, the results show a low statistical significance level. However, variables like accumulated experience and private sector of activity increase

the motherhood wage gap. The variable that improves significantly the wage gap is the urban area of residence for the women with children.

Parenthood wage gap - OLS estimation results

Table 1

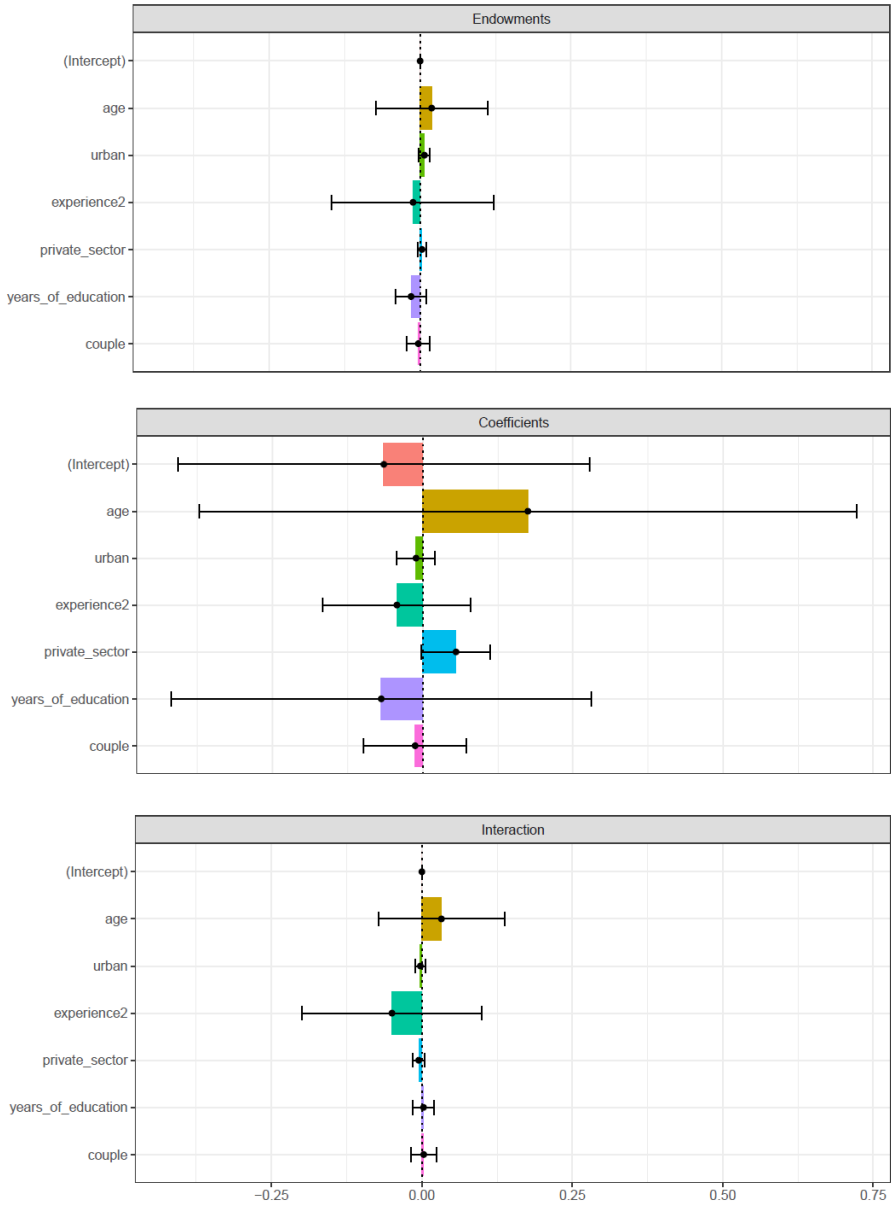
Variable	Women (1)	Men (2)
Parent	-0.05154** (-0.01902)	0.02020 -0.02381
Age	0.01648*** (-0.00207)	0.01280** (-0.00255)
Experience squared	-0.00036*** (-0.00004)	-0.0003*** (-0.00005)
Urban area	0.05786*** (-0.01709)	0.10940*** (-0.02014)
Presence of children <= 3 years	0.11630* (-0.04646)	0.10940* (-0.04646)
Private sector	-0.00918 (-0.01839)	0.00024 (-0.02375)
Intercept	2.61100*** (-0.06452)	2.72400*** (-0.07941)
Adjusted R-squared	0.25320	0.16350

Data source: EWCS 2015 selection, author modelling; statistical significance: ‘***’ 0.001, ‘**’ 0.01, ‘*’ 0.05, ‘.’ 0.1, ‘ ’ 1; standard error is in brackets.

Figure 1 shows the obtained graphical results of the threefold Blinder-Oaxaca decomposition of the motherhood wage gap. The wage gap across the group of women is decomposed in three terms: endowments, coefficients and interaction between them. The endowments results suggest that the explanatory variables with clearly statistical significance are age, urban residence, experience squared and years of education achieved. The main component due to the group differences in coefficients is attributed to private sector of activity. Women with low numbers of years of education and experience tend to earn less. The analysis results indicate also that a big number of women with children have less experience and a low level of education. Out of these it is observed also that many of them are single and do not form a couple.

Threefold Blinder-Oaxaca decomposition between women with and without children

Figure 1



Data source: EWCS 2015 selection; author modelling; $p < 0.05$

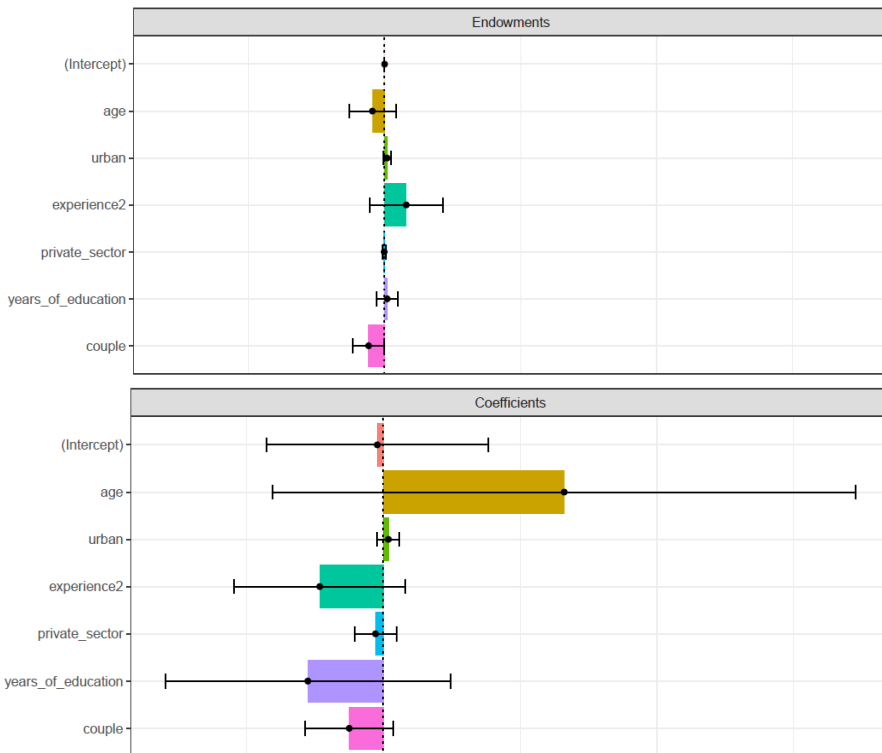
Figure 2 presents the graphic results of the threefold Blinder-Oaxaca decomposition of the fatherhood wage gap.

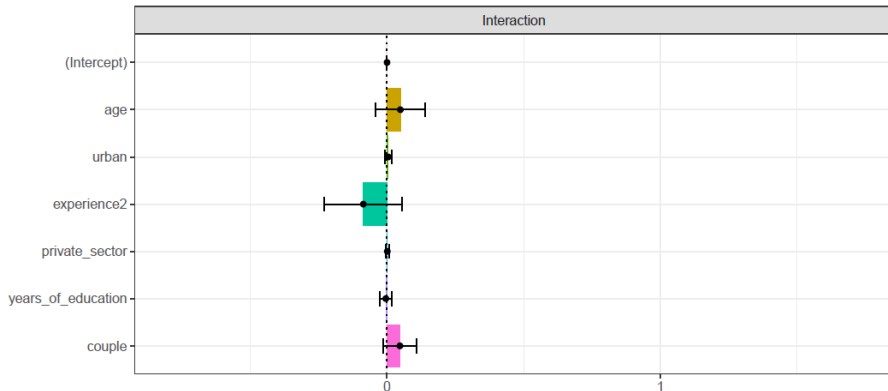
In the endowment component the variables with significant contribution are urban residence and years of schooling.

It seems that a major part of the wage gap between men without children and fathers, is due to group differences in the ratio of individuals with more years of education and that work in the cities. The coefficient component (“effect size”) shows that only the variable that indicates residence of the individuals has clearly a high statistical significance. Cross-group differences in the interaction component indicate more visibly that age and couple variables occur at the same time.

Threefold Blinder-Oaxaca decomposition between men with and without children

Figure 2





Data source: EWCS 2015 selection; author modelling; $p < 0.05$

The obtained results for Jann’s variation of the twofold Blinder-Oaxaca decomposition are presented in Table 2. The difference of the wage logarithm between women with and without children in the explained part is driven by the experience variable. Further, a positive impact is attributed to the age variable. The unexplained part, which can be attributed to discrimination, is influenced by variables such as age and private sector.

Comparing fathers to men without children, in the explained part a positive contribution is due to urban area and experience variables. The negative contribution due to the variable that indicates a couple favours men who have children. The part which can be attributed to discrimination is determined by experience and years of education.

Results of the twofold Blinder-Oaxaca decomposition of the motherhood wage gap and of the fatherhood wage gap

Table 2

Gender wage gap : 0.073		
	<i>Motherhood Wage gap: 0.0091</i>	<i>Fatherhood Wage gap:-0.0023</i>
	Coefficients	Coefficients
<i>Explain - total</i>	-0.018778422	0.007282
<i>by</i>		
Age	0.0449690779	-0.0046067464
Urban area	0.0056039395	0.0121353752
Experience squared	-0.0542392754	0.0074242710
Private sector	-0.0006866698	-0.0005336832
Years of education	-0.0129429405	0.0056571244
Cuple	-0.0014825538	-0.0127940038
Intercept	0	0
<i>Unexplain - total</i>	0.0278329	-0.00968
<i>by</i>		
Age	0.18166300	0.66920331
Urban area	-0.01230084	0.01955318
Experience squared	-0.05054981	-0.24703174
Private sector	0.05371143	-0.02889353
Years of education	-0.06860252	-0.27661884
Cuple	-0.01121766	-0.12363249
Intercept	-0.06487070	-0.02225642

Data source: EWCS 2015 selection, Jann (2008) variation $p < 0.05$; author modeling

CONCLUSIONS, FURTHER RESEARCH AND POLICY RECOMMENDATIONS

Based on research conducted on the selected dataset one of the findings shows that the presence of a child aged less than 3 years constitutes positive returns in wages for the mothers. Such findings are plausible as the age of birth is on an increasing trend in Romania and also gives an insight to the fact that women decide to give birth when financial situation is improved.

Furthermore, on the overall level the decision on having children leads to a wage penalty in the total motherhood wage gap. These conclusions comply with the recent findings on the natality decreasing trend recorded in Romania. This phenomenon corroborated with the high level of migration observed for the past years in Romania (European Commission, 2018; Cedefop, 2016), deserves careful investigation as also pointed by Caragea et al. (2013) and by Dobre and Caragea (2015), on the root causes that constitute the fuel for it.

Through concrete social policies that improve the status of women by granting better social protection for the family with children will improve not only the natality but it will also diminish the negative effects of the motherhood penalty and fatherhood premium effects.

Offering better fiscal facilities such as low salary taxation dependent by the number of children and a deduction of basic needs expenses for newborn for a fixed amount of money for families with children may also be a better suited option to counterpart the adverse effects on population aging and to reduce the overall wage gap between parents and nonparents.

An interesting approach is to further study the behavioural perception in both segments of population on how the education impacts the decision on giving birth to children versus the level of income stratification. As our society seems to be moving in a direction that is convergent to a bipolar economy or either diverges from a society with multiple stratification it should be investigated the above stated phenomenon's impact amongst parents. This gives better clarity on the correlation between the alternation period of the economic expansion and contraction directly linked to the natality.

Further research direction is to reveal insights into the parenthood wage gap amongst men and women working for the public and private sector.

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