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IDENTIFYING THE WAGE GAP BETWEEN MEN AND WOMEN. THE CASE OF GREECE

Abstract

Gender wage gap is an European and International socioeconomic phenomenon with a negative contribution to the efforts of social cohesion, integrity and creation of a solidarity economy. In national level, efforts for the identification and elimination of the gender pay gap have already started since 1970. Although, the phenomenon of the pay gap was been moderated, it still remains at levels above the European average. The analysis and confrontation of the multifactorial phenomenon requires a holistic approach. Women can actively contribute to employment and economic and social development through the improvement and enhancement of their skills and their general qualifications. However, their skills are often underestimated in respect to their payment and their hierarchy in the labour market. This paper studies the case of Greece by estimating the factors that generate the gender wage gap and the glass ceiling phenomenon through the analysis of micro data from 2010 Earnings Survey provided by the Hellenic Statistical Authority (ELSTAT). We estimate pooled quantile regressions as well as quantile regressions, and we carry out a decomposition analysis by applying the Oaxaca-Blinder decomposition technique. The results reveal that the wage gap is mainly formed due to the discrimination of gender (men and women with the same characteristics receive different wages – female wages are significantly

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lower). Moreover, we approach the glass ceiling phenomenon which is mainly caused due to personal characteristics of individuals.

Key words:

SSE, gender wage gap, Oaxaca – Blinder technique, glass ceiling effect, socio economic re-evolution.

JEL: R23, J3, Z.

1. Introduction

According to The European Commission's Strategy for Equality between Women and Men 2010–2015 (COM(2010a)), financial independency plays a crucial role in correct decision making for both genders. Everyone seeks for financial independency since entering the labour market. The level of financial independency depends on the financial rewards given to individual.

Discrimination in labour market occurs when two workers with the same skills are treated differently (related to recruitment, salary or working conditions), due to an exogenous characteristic such as gender or race, education, training and work experience. The aforementioned, exogenous factors create a gap between employees.

In Greece, family and business are often interdepended. Moreover, the gender segregation in labour market that is often observed, establishes different standards for men and women (Stratigaki, 2007). In family business, a noteworthy percentage of women employees that are members of the family, work for free. Moreover, even in cases where women are paid, the existence of an intense gender discrimination causes inequalities in payment.

One of the fundamental principles of the European Union, is equal payment for equal work. Unfortunately, this fundamental is not a fact for the majority of European women employees, even nowadays. The implementation of equal pay policy started in the early 1970s in Greece, however the gender wage gap is a reality of the Greek society. Gender wage gap is more intense not only at large

firms in higher wage scale where remuneration exceeds the basic salaries of collective agreements, but also in small firms.

A noteworthy fact is that after the enactment of the legislation on equal pay, there was a timeless reduction of the gender pay gap which contributed on the increase of the percentage of women's participation in the labour market, reduction of female unemployment rate, as well as mitigation of the discrepancies between the employment rates of women and men.

The reduction of the gender pay gap, is an aftereffect of several factors such as increase of the rate of female graduates in higher education, admission of female labour in certain "male-dominated" sectors (e.g. construction or engineering) and finally change of women's culture. Nowadays, women pursue their economic independence from parental and marital family.

On the other hand, factors that usually intensify gender wage differences, are the following:

- inequalities in the participation of male and female employees in labour market (usually females have lower concentration);
- gender differences in occupations and activities that tend to be female-dominated or male-dominated;
- differences in working conditions, (i.e. form of employment). The noteworthy difference in working conditions, is the increased participation of women in part-time;
- outdated mentality in both public and (mostly) private employment sector in terms of career development and unpaid work permit / maternity leave (Ntonta, 2014);

Objective of this paper, is the identification of the factors that affect the formation of gender pay gap and the glass ceiling phenomenon in Greece. For the purposes of the study we classify those factors in three categories: i) personal characteristics, ii) sectoral/department characteristics, and iii) job position characteristics[1].

The «glass ceiling» phenomenon is defined as the obstacle encountered by women in career advancement, beyond a hierarchical level. In several sectors of the economy, the opportunity for professional development of women, both in terms of supervision – obtain positions of responsibility, and in terms of remuneration, are almost absent/nonexistent. Using micro data from 2010 Earnings Survey, provided by ELSTAT, and applying the Oaxaca–Ranson decomposition methodology, we identify the factors with the greatest influence in the formation

[1] The term «Job position» reflects the concentration of workers in the branches of economic activity and is divided into a) sectoral bargaining power in collective agreements and, b) sectoral gender distribution

of the gender pay gap in Greece. This method enables the estimation of each factor separately, by calculating different wage equations for each sex (men, women and the total of them). Afterwards, the factors are classified to different characteristics of both sexes and to distinction that comes from different wages to workers with similar characteristics. At last we assess the gender pay gap in accordance to the estimated factors and their classification.

The rest of the paper is organized as follows. In Section 2 we present a literature review. In Section 3 we display our dataset and explain the variables used in the study. In Section 4 we represent the methodology used for the identification of factors that form the wage gap. In Section 5 we analyze the empirical results, while in Section 6 we examine the phenomenon of the ceiling glass. At last, in Section 7 we draw our conclusions.

2. Literature Review

The study of the pay gap occurs a significant number of studies which are focused on the identification of factors that shape and influence wage inequalities. The investigations carried out study the phenomenon of gender pay gap at national, European and international level and at different time periods.

Goldin (1190), examines the gender wage gap, based on historical events that took place in America during 1950–1980. The study was based on the following variables: the female and male payment, the age of the employees and the type of work. The results, confirm the existence of pay gap between men and women. Despite the identifying wage inequalities between men and women, it is worth noting that one of the main conclusions of the study was the anxiety of men as far as it concerns female entrance in the labour market. The existing anxiety was attributed to the fact that the entry of women caused a reduction in the earnings of men.

Stanley and Jarrell (1998) were the first to implement the Oaxaca-Ranson decomposition method on gender wage inequalities in the US. In their study, they identified 12 factors which affected the reported US gender wage inequality and explained 80% of its variation.

The study of Nicodemo (2009), examines the extent of the wage gap in various countries such as France, Greece, Italy, Portugal and Spain in 2001 and 2006, using available data from the EU-SILC and the European Community Household Panel Survey (ECHPS). The results of the study reveal a positive wage gap in all countries and periods, most of which cannot be explained by observed characteristics. Moreover, the gender gap is larger at the bottom of the distribution and smaller at the top in most countries in 2006, illustrating the existence of the «glass ceiling» and «sticky floor» phenomena.

Another study examining the gender wage gap in various countries is that of Arulampalamet al. (2007). The countries under examination are Austria, Belgium, Great Britain, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands and Spain. Using the OECD (2001) Work-Family Reconciliation Index for the time period 1995-2001, the authors examine possible factors that affect the extent of the wage gap. The results show that differences in work-family reconciliation policies and wage-setting institutions have a significant role in the formation of wage gaps.

Relevant work and studies of the gender wage gap in national and comparative transnational level have been carried out, in an effort to further understand the causes of its creation.

3. Variables and Data

By using microdata of Earnings Survey 2010 in Greece (case study) we proceed with structure an econometric model in order to estimate the contribution of social factors and locate the criteria that form the gender wage gap. A total of 39.832 cases were analyzed, more specific the sample is composed as follows: 22.216 records are related to a sample of men workers and 17.616 records represent the sample of women.

Following we provide a list of the dependent and independent variables used in order to apply the Oaxaca-Ranson methodology.

The dependent variable ln (*w*), represents the logarithm of the average gross hourly earnings. The pay gap between genders is presented as a percentage of men's earnings and reflects the difference of the average gross hourly earnings between men and women.

Variable **Sex**, refers to gender and takes the value 1 for men and 0 for women. We use the variable Sex to partition our sample by gender in order to separately calculate equations for men and women.

Furthermore, the study uses distinct variables for different levels of education as follows: Primary school, Lower Secondary, Upper Secondary, VET, University. For the needs of the study we develop dummy variables for every level of education. Depending on the level to which the employee belongs, variables take value 1 or 0.

Potential Experience is calculated as follows: the age of the respective employee minus years of education, minus the start of schooling age (6 years), minus previous experience in hers/his most recent work minus nine months (for military service – for men).

The variable **Tenure** represents the work experience related to the business in which the employee worked at the time of the Earnings Survey realization. It is the number of the employee's years of service in the company working at the time of research realization.

In order to estimate the contribution of each economics' activity sector in the formation of the gender pay gap we use 22 dummies for each branch of economic activity (NACE).

Variable **Nationality** takes the value 1 for employees with Greek citizenship and the value 0 for the rest. The variable Nationality is used in order to identify the discrimination against workers who do not have Greek nationality/citizenship.

In order to identify the characteristics of job position we estimate the variables: Overtime hours, Shift Work, Temporary, Supervision. The variable Overtime hours express the overtime worked by the employee, the variable Shift Work takes the value 1 when the employee performs work in shifts and the value 0 otherwise. The variable Temporary express the type of collective agreement. For the collective agreement of specific time the variable takes the value 1, while for a permanent collective agreement it takes the value 0. Supervision takes the value 1 when the employee has supervision duties and the value 0 otherwise.

For professions we have created 21 dummy variables based on double-digit classification ISCO 88. For two cases we grouped professions based on the one digit classification, more specific for ISCO 1 Managers and Senior Officials and ISCO 9 for unskilled workers.

4. Analyzing the Gender wage gap – Oaxaca – Ransom decomposition method

In this section we present the methodology used in order to identify the gender wage gap and analyze its components. For that purpose we apply an econometric model which includes the following steps:

1. estimation of wages' equation for men and women separately and for the total of the employees, by applying multiple regressions (OLS)

2. analysis of gender wage gap in its components

Initially, we estimate the contribution of each factor in shaping the gender wage gap. Then we group the factors that can better explain the wage gap, those are:

- differences between men and women workers with respect to their characteristics (education, experience, economic activity sector, occupation, etc.)
- wage difference between men and women having the same characteristics
- different distribution of men and women in sectors and occupations
- «pure» wage discrimination against women («pure» in the sense that it is not related to the different evaluation and remuneration of labor characteristics).

For the purpose of the gender wage gap analysis we start to consider a simple unadjusted model of wage determination:

$$\ln Wi = \beta\ (X_i\ ) + c + \varepsilon_i \quad (1)$$

where *Wi* denotes the natural logarithm of hourly wages for an individual (i), *Xi* denotes a set of observed characteristics, β denotes the regression coefficients, *c* denotes the unexplained gap, and ε_i is a random error term. In order to investigate the sources of gender differentials in detail, we estimated men's and women's wage functions separately such that:

$$\ln W_i^m = \beta^m\ (X_i^m\ ) + c^m + \varepsilon_i^m \quad (2)$$

$$\ln W_i^f = \beta^f\ (X_i^f\ ) + c^m + \varepsilon_i^f \quad (3)$$

Given this information and following Oaxaca-Blinder (1993), we proceed to decompose the mean difference between the male and female earnings into a portion attributable to characteristics and portions attributable to the «male advantage» and the «female disadvantage».

Oaxaca-Blinder (1993) decomposition method gives the following equation:

$$\ln \overline{w}^m - \ln \overline{w}^f = \left(\overline{\overline{X}^m} - \overline{X}^f\right)\beta^* + \left[\overline{X}^m(\beta^m - \beta^*) + \overline{X}^f(\beta^* - \beta^f)\right] + (c^m - c^f). \quad (4)$$

According to Oaxaca decomposition technique (4),

- the first term $\left(\overline{\overline{X}^m} - \overline{X}^f\right)\beta^*$ is the gender wage gap attributable to differences in characteristics.
- the second $\left[\overline{X}^m(\beta^m - \beta^*) + \overline{X}^f(\beta^* - \beta^f)\right]$ term captures the difference between the actual and pooled returns for men and women, respectively. Under discrimination, men are paid competitive wages but women are underpaid. If this is the case, the coefficient of men should be taken as the non-discriminatory wage structure. Conversely, if em-

ployers pay women competitive wages but pay men more, then women's coefficient should be used as the non-discriminatory wage structure.

- The third term ($c^m - c^f$) is the «pure» discrimination against women (it also contains the influence of unobservable characteristics).

Continuing we incorporate dummies in the equation. Using dummies, we are able to determine the impact of the following factors on the pay gap:

- different distribution of men and women in sectors and occupations
- different evaluation of the «female» from male professions and jobs, which has led to an underestimation of women and appreciation of male labour.

5. Empirical Results

Using micro data from 2010 Earning Survey in Greece, we calculated the average of the dependent variable ln (w) and the independent variables for three equations: an equation for the total of employees, an equation for men and an equation for women. We list the main conclusions, arising from the analysis as following:

- Regarding the dependent variable ln (w), the average hourly earnings of men and women are 11.46 euro, and 9.62 euro respectively, while the average hourly earnings for all employees are 16.05 euro. Therefore, the average hourly pay of male workers are above the average, while women are paid less. The pay gap between men and women is 16.05.
- Examining the personal characteristics of workers, we observe that the majority of men are secondary school graduates (42%). Moreover, there is a marginal superiority of women in the educational level. The percentage of women graduates in secondary and higher education is higher compared to the percentage of men by 2% and 7% respectively.
- Potential experience and Tenure have almost the same concentration for both sexes, with a minimum excellence of men.
- Nationality has very high concentrations for both sexes with an excellence of 3% for women, suggesting that the Greek labour market has a very small percentage of workers with different nationalities.

- Examining the distribution of workers in economic sectors, we observe that the majority of men are concentrated in sectors of manufacturing, mining and quarries as well as in transport and storage. As far as it concerns women, the superabundance is concentrated in sectors of wholesale and retail trade, in activities related to human health and social work and in manufacturing.

A noteworthy fact is that according to results of the research, the percentage of men with supervisory duties is 4% higher of the respective percentage of women. Moreover, men receive higher payment for overtime hours, 4.22 euro per hour while women receive 3.17 euro per hour. The percentage of men's concentration in shift work prevail that of women, furthermore most women are employed with fixed-term collective agreements, while the respective percentage of men's concentration in that factor is significant lower.

Following we present the most significant factors for the formation of payment for all workers:

- The variable Tenure has the highest degree of significance, so the years of service in the last company / organization determine the amount of the employee's salary. A factor with equal importance – as expected – is the total work experience of the employee (potential experience).
- As far as it concerns the sector/department characteristics, the sectors that are highly dependent on the salary of the worker is the sector of financial and insurance activities and the industry of electricity.
- Examining the job position characteristic, the results reveal that supervision has the greatest significance in the amount of the employee's salary, while shift work is rewarded more compared to overtime work.

The main scope of this study is to identify which are the main factors that influence wage formation and the gender pay gap. Therefore, a comparison of wages paid by the market for workers of different sex but with the same characteristics is essential. The main results for the aforementioned comparison are listed below:

- Men workers receive higher salaries regardless of education degree/level, nonetheless there is no significant difference between the payment rates. The gross hourly pay of workers is much higher for graduates of higher education. Considering all other factors constant, the increase amounts to 13.3% for women and 19.9% for men.
- Tenure is evenly paid for both sexes, therefore the variation in wage between men and women is almost insignificant.
- Men with potential experience receive marginal higher salaries compared to female salaries.

- The Nationality prim is a fact for both sexes, although men earn more than women.
- Men empowered with the duties of supervision receive higher salaries. That fact confirms that Greek women are not authorized with supervision duties.
- Shift work is remunerated more for men, this distinction is probably due to the fact that women perform comparatively less shift work than men.
- Men managers and senior officials gain significant higher salaries, a fact that indicates that the Greek labour market does not equate female labour with male. The gender wage gap for employees with the same characteristics is 20%.
- Moreover, men remuneration prevails women in scientific professions health and educational professions.
- Overall men receive higher salaries, in most professions, while sellers and farmers receive the lower salaries for both sexes. Furthermore, women's salaries are significant lower compared to men's in professions such as machine operator's and assemblers, workers in mines and other professions related to crafts. The difference in earnings for specific professions is mainly attributed to zero or significant low concentration percentage of women employed.

5.1. Analyzing the individual components of gender wage gap using the Oaxaca – Blinder methodology

Based on the results from the estimation of independent variables and the dummies that represent personal characteristics, sectoral characteristics and job position characteristics, we estimate the impact of each separate variable in the gender wage gap. The equation of the wage gap between men and women using the Oaxaca-Blinder (1993) decomposition method is the following:

$$\ln \overline{w}^m - \ln \overline{w}^f = \left(\overline{\overline{X}^m} - \overline{X}^f \right) \beta^* + \left[\overline{X}^m (\beta^m - \beta^*) + \overline{X}^f (\beta^* - \beta^f) \right] + (c^m - c^f).$$

Table 1 presents the results yielded from the analysis, while Figure 1 depicts the results.

➢ **General Results**

1. Differences in the characteristics of both employees (personal characteristics, sectoral characteristics and job position characteristics) contribute 0.42% of total gender pay gap, which amounts to 16.05%.

2. Market discrimination (different prices paid by the labor market to workers of both sexes) for same characteristics, contribute 7.26% of the gender wage gap. Accordingly, the greatest distinction between sexes comes from gender discrimination, as women who have the same characteristics as men earn less.

3. «Pure» discrimination against women has a negative effect on gap's formation as it increases it by 8.37%. This percentage reflects discriminations not associated to specific characteristics, but mainly to gender. «Pure» discrimination interprets 52.1% of total pay gap.

4. Personal characteristics contribute 4.43% to gap's increase, while characteristics of job position have a stimulative effect on the pay gap favoring men by 3.01%. Sectoral characteristics decrease pay gap with an insignificant percentage of 0.18%. At this point, it should be noted that regarding the sector's/department's characteristics, the analysis was based on the contribution of each economic sector (NACE rev.2) in shaping the wage gap.

Analyzing thoroughly the results of Table 1, we get the following findings:

1. The educational level of the employees contributes slightly in the gap configuration. Specifically, it acts as a pay gap reduction factor of 0.19%. Examining the determinant factor «differences in characteristics», the results reveal that the educational level increases pay gap only by 0.2%. Respectively, examining the determinant factor «market discrimination for same characteristics», the educational level reduces gender wage gap by 0.001%.

2. Potential experience has a strong stimulative effect on the pay gap favoring men by 1.23%. Examining the contribution of each determinant factor, we can see that 0.33% of the aforementioned percentage is attributed to «differences in characteristics», while the rest 0.9% is attributed in «market discrimination for same characteristics».

3. Tenure contributes only 0.44% to the formation of the wage gap.

4. The «discriminatory bonus» for Greek nationality favors men by 3.31%, though contributes significantly in the formation of wage gap, pinpointing that Greek labour has an indisputable preference in men employees with Greek nationality/citizenship.

5. Supervision, overtime hours, shifts, temporary work are factors that raise wage gap by 0.234%. Sex distribution in professions has a positive effect in the gap. Specifically, as far as it concerns the determinant factor «market dis-

crimination for same characteristics», sex distribution in professions, contributes to increase the gap by 2.86%. Therefore women having the same characteristics with men are paid lower salaries.

Table 1

Contribution analysis in gender wage gap

Oaxaca-Blinder Analysis – Differences%	Differences in Characteristics (1)	Market discrimination for same characteristics (2)	Total (1)+(2)	Discrimination in unexplained gap	Gender Wage Gap estimated by regression
	(1)	(2)	(1) + (2)		
	$(X^m - X^f)\,\beta^*$	$(\beta^m - \beta^*)\,X^m + (\beta^* - \beta^f)\,X^f$		$C^m - C^f$	$1 - (w^f - w^m)$
Personal Characteristics	0,36%	4,43%	4,79%		
Education	–0,2%	0,01%	–0,19%		
Potential experience	0,33%	0,9%	1,23%		
Tenure	0,32%	0,12%	0,44%		
Nationality	–0,09%	3,4%	3,31%		
Sector/Department Characteristics	–0,02%	–0,18%	–0,20%		
Sectoral Negotiation Strengths		–0,18%	–0,18%		
Sex distribution in sectors	–0,02%		–0,02%		
Job Position Characteristics	0,078%	3,01%	3,093%		
Supervision, overtime hours, shifts, temporary work	0,084%	0,15%	0,234%		
Sex distribution in professions (ISCO 88)	–0,006%	2,86%	2,866%		
Total	0,42%	7,26%	7,68%	8,37%	16,05%

6. Glass Ceiling Effect Estimation in Greece

This section examines the existence of the glass ceiling phenomenon in Greece. For the analysis we apply again the wage equations for men and women as presented in Section 4, and in continuation we apply Quantile Regression (Koenker and Bassett, 1978), in order to estimate how the male-female pay gap varies across the pay distribution. We decompose the pay gap at different quantiles of the pay distribution into differences in endowments of wage, determining characteristics and differences in the returns for the same characteristics. This approach allows the examination of the «glass ceiling effect» and the approach of the range, with a statistically acceptable manner.

The observed labour inequalities between men and women, is an aftereffect of their concentration in different position of the organizational hierarchy. After the amelioration of women's educational level and the alteration in social perceptions of male and female roles, most people expected that women where to rise in employment hierarchy and in remuneration levels (Wirth, 2001). Nevertheless, there is still discrimination in the position of women's work by suspending the raise in their salaries and their professional development (Dermanakis, 2004).

Women having the same skills/qualifications with men have limited opportunities for professional development and remain at the lower levels of the hierarchy. Furthermore, women's educational level is not directly linked to their positions in the labor market, nor to their remuneration. Women are mostly employed in professions characterized as «female» and remain in the lower levels of hierarchy, moreover they encounter obstacles/difficulties in their effort to ascent in the hierarchical level. the term «glass ceiling» refers those obstacles encountered by women when trying to achieve professional development and the existence of a threshold in terms of professional development in their workplace.

The «glass ceiling» involves obstacles steaming from educational and experience requirements. It reflects the unequal treatment phenomenon, which is not explained by the person's skills and capabilities, but caused due to its sex (Ventoura et al., 2007).

6.1. Methodology for the estimation of the «glass ceiling» effect

In order to examine the existence of the «glass ceiling» phenomenon, we estimate the wage equations as in Section 4 and then we run a Quantile Regression (Koenker and Bassett, 1978), in order to estimate how the male-female pay

gap varies across the pay distribution. This approach allows the examination of the «glass ceiling» phenomenon, with a statistically acceptable manner. The method is based on the regression analysis proposed by Melly (2005), Machado and Mata (2005), and Gosling (2000).

The distribution of wage equation poses a range which can be divided into quantiles, representing the different parts of distribution. The distribution is divided in four equal parts by quarters. Those parts are listed in the literature as, first (1^{st}) or 25^{th} quantile, second (2^{nd}) or 50^{th} quantile or even median, third (3^{rd}) or 75^{th} quantile and the fourth (4^{th}) or 90^{th} quantile.

The isomeric regression is a technique for estimating θ quantiles of the dependent variable y (log wages in case of the study), compared to the independent variables. The regression model (Koenker and Bassett 1978 or Buchinsky 1998) assumes that the dependent quantile q_θ is linear in the independent variables, i.e. $q_\theta = x\beta(\theta)$, the coefficient $\beta(\theta)$, is calculated as follows:

$$\min_{\beta(\theta)} = \left\{ \sum_{i=y_i \geq x_i\beta(\theta)} \theta \left| y_{i-x_i}\beta(\theta) \right| + \sum_{i=y_i < x_i\beta(\theta)} (1-\theta) \left| y_{i-x_i}\beta(\theta) \right| \right\}. \qquad (5)$$

The isomeric regression enables the estimation of the marginal effect of independent variables, in returns (log wages) at various points of the distribution. Thus, implementing the isomeric regression we are able to assess the effect of variables such as education, experience, etc., on returns (log wages) on the lower level of distribution returns (e. g. 1st quarter), in the middle, and in the distribution's peak (e.g., in the fourth quadrant). Implementing the isomeric wage regressions, the coefficients estimations β(θ), are interpreted as the estimated effects of individual characteristics on θ quartile of the wage distribution.

Following we decompose the isomeric regression, using the Oaxaca-Blinder technique, to identify the gap between sexes for every quantile of the distribution. By doing so, we record two cases:

(i) the first case, which is attributed to the first term on the right of equation (6), is the size of the impact of the different characteristics of both genders in pay gap (by «different» we do not only mean the differences in personal characteristics, but also in jobs and businesses)

(ii) the second case, which is assigned by the second term on the right term of equation (6), indicates that the gap is a measure of discrimination against women when they offer work with characteristics similar to men albeit paid for them less, i.e. the extent to which only the gender difference affects the pay gap and contributes to the creation of glass ceiling phenomenon.

The equation of decomposition by Oaxaca – Blinder is:

$$x^m\beta^m(\theta) - x^f\beta^f(\theta) = \left(x^m - x^f\right)\beta^f(\theta) + x^m\left[\beta^m(\theta) - \beta^f(\theta)\right] \quad (6)$$

Figures 1 and 2, illustrate the empirical results for every case, at every point of wage distribution (quantile) for all employees and for every factor separately and in total. The empirical results reveal that the glass ceiling phenomenon is mainly caused due to individual differences between sexes. Education has a significant role in the formation of the «glass ceiling» phenomenon and more precisely tertiary education is the individual element with the most significant impact.

According to Figure 1, women in the higher hierarchical level (4th quantile) receive up to 3.8% lower payment, due to different characteristics of employees (case i). Respectively, Figure 2 illustrates that the difference in remuneration between men and women, employed in the higher hierarchical level attributed to racial discrimination (case ii), is up to 2.2%.

Figure 1

Case i: Different characteristics of both genders in pay gap per quantile

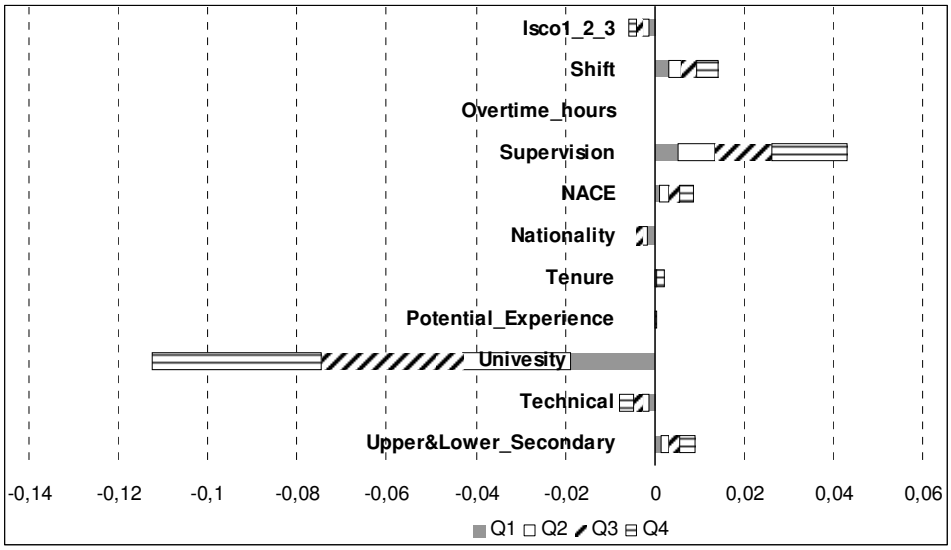
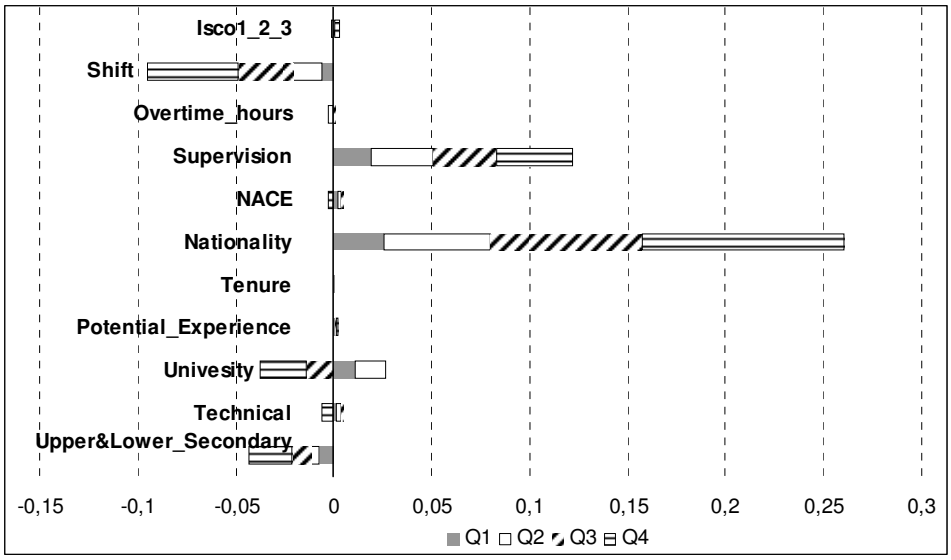


Figure 2

Case ii: Different remuneration for similar characteristics – Racial Discrimination



The percentage of employed women in positions of responsibility, is also a factor with a significant impact on the appearance and the intensity of the «glass ceiling» phenomenon. It is noteworthy, that according to the analysis results, female payment in positions of responsibility contributes to reduce the «glass ceiling» phenomenon. So, a potential increase of the amount of women employed in positions of responsibility, would contribute to reduce the gap and the «glass ceiling» phenomenon.

Table 2, provides the cumulative results of both cases per quantile. The main result yielding from Table 4 is that the phenomenon of glass ceiling is mostly located in the third and fourth (75^{o} and 90^{o}) quantile of the wage distribution – i.e. the highest levels of remuneration – mainly due to differences in characteristics between men and women (personal characteristics etc.), rather than to gender discrimination.

Table 2

Detailed illustration of alternative cases i) and ii)

Quantiles	*Q*1	*Q*2	*Q*3	*Q*4
Case i – different characteristics of both genders in pay gap per quantile	–0,0116	–0,01246	–0,01547	–0,01602
Case ii – different remuneration for similar characteristics – Racial Discrimination	0,0447	0,0859	0,0601	0,1001

Considering the analysis of the «glass ceiling» phenomenon, we need to stress out that social factors (e.g. the employee's family status) causing the examined phenomenon should not be omitted.

Work and family are two factors / areas with intense interdependence and important role in a person's life. Often those two sectors are conflicting, the conflict originates from the perception that participation in one sector is made more difficult by participation in the other. These conflicts affect employee's performance (Barreto, Ryan, Schhit (2009)). Women are occupied in part-time jobs and abandon the idea for professional development, as they believe that they are not capable to maximize their efficiency in both sectors simultaneously. As a result, women tend to limit their performance in labour market, for the sake of their family and the upbringing of their children. On the other hand, men are considered more dedicated and available to the demands of work even if they have family (Liff and Ward (2001). So we draw the conclusion that motherhood and family obligations lead to different work and career models for both sexes.

Additional factors with an impact in the formation of the «glass ceiling» phenomenon are the lack of necessary conditions and infrastructure (flexible or flexible hours, childcare facilities, understanding by senior). But even if a woman has no family responsibilities, it is less likely to be selected during the evaluation for a promotion in relation to the chances of a man.

7. Conclusions

Scope of this paper is to identify the factors with the greatest influence in the formation of gender wage gap. For the analysis we use micro-data from 2010 Earnings Survey of Greece provided form ELSTAT, the results reveal that the

gender pay gap is a reality in Greek labour market. For the purposes of the paper, we proceed to an econometric analysis of the pay gap and the major factors contributing to it. Furthermore, we examine the «glass ceiling» phenomenon and identify the major factors that form it.

The main findings of this paper pinpoint that the discrimination between sexes is due to a gender dimension, women having the same characteristics with men receive lower payment. More specific, market discrimination for same characteristics contributes 7.26% to gap's incensement. Moreover, sex distribution in professions has a significant negative effect to gap's formation favoring men by 2.86%. In order to narrow the pay gap, policy measures need to be implemented in order to encourage the reduction of job segregation by sex.

The educational level of the employees has a minimum contribution in the formation of the pay gap. A noteworthy fact is that the educational level of men and women is almost equal, we notice that women have higher rates of concentration in higher education. Even if it looks like the educational level has an insignificant contribution to gap's formation, the difference in sexes' educational choices/preferences towards discipline, specialization, science etc., are reflected to their professional choices. So the education has an indirect effect in the formation of gender wage gap.

Market discrimination for same characteristics contributes 7.26% to the formation of the pay gap, while the discrimination due to gender (pure gender discrimination) and non-recorded factors has a negative effect on the pay gap, as it increases it by 8.37%. An additional factor, with significant influence in gap's formation is Nationality, the results reveal that Greek labor market favors men with Greek nationality, as it awards them with higher salaries.

Regarding the «glass ceiling» phenomenon, it is detected mostly in highest levels of remuneration (75^{th} and 90^{th}) quantile and it is mainly formed due to different characteristics between both sexes. Furthermore, the glass ceiling phenomenon occurs to a greater extent on the personal characteristics of individuals and particularly in higher education, suggesting that women with the same level of education earn less than men in higher positions of the hierarchy. The glass ceiling phenomenon, limits the diversification in the workplace and reduces women's occupation in senior positions – women lack of opportunities for developing their skills.

Reducing the aforementioned conclusions of the 2010 findings in the current situation and bearing in mind that the adverse impact of the 2008 crisis in the country's economy was highly manifested from the 2010, it appears that the estimated pay gap and its underlying factors, reflect the current situation (year 2016).

In this framework and considering that the country's fiscal situation has worsened compared to 2010 (continued reductions in fees and the abolishment

of collective agreements for workers), we could state that the determinant factors explaining the wage gap of 2010 also explain the wage gap in the current period.

However, further issues related to the gender pay gap in Greece during the crisis, can be found in the aggregates of labor market. Part-time employment was predominantly an option for women. So, an issue for examination is whether the reduction of full-time employment and the collateral increment of part-time employment, combined with the reduction of employers and self-employed (as a result of limitation on the number of viable business enterprises and jobs or working hours) replaced full-time with part-time employees and resulted in:

- increase of women's employment rate
- reduction of disparity in unemployment rates between men and women.

Examining data in a monthly basis, from the Labour Force Survey of EL-STAT, we extract the following findings regarding the figures of labour market for the period 2008–2016 (3rd quarter):

- During 2008–2016, female employment reduced in absolute terms but increased marginally to total employees (from 39,6% to 42,1%), at the same period the rates of male employment had a marginal decrease in total (from 60,4% to 57,9%).
- The percentage of female occupation both in full-time and part-time employment had an increase. On the other hand, the percentage of men in total full-time employment decreased to 54% (from 59%), while part-time employment doubled from 2% to 4%.
- The unemployment rate affects both men and women, during 2008-2016 there was an increase of 14.7% and 16.6% for men and women respectively. At the same time there was a reduction of women's rate in total unemployment rate. In 2008 the rate of unemployed women was 61%, while during 2016 it was 53%.

Overall the adverse economic situation resulted in employment's decrease for both sexes in absolute terms which also resulted in the increase of unemployment for both sexes. However, the percentage of women in the labour market strengthened both full-time and part-time employment, though the discrimination between men and women is a fact both in employment rates which clearly favor men and the unemployment which mostly affect women.

Finally, it should be noted that the rising rate of women in the labor market is a response of pressures on households due to the loss of many jobs as an aftereffect of the economic crisis, which affected sectors with an outstanding presence of male workforce such as the construction industry.

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