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Assessing the gender wage gap in the culinary occupations in Cyprus±

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Abstract

Cyprus has long been a party to the EU instruments prohibiting discrimination against women, yet it displays a significant pay gap. Using data from the Structure of Earnings Surveys of 2010 and 2014, the author finds that the gender wage gap in the culinary sector declines, but its share explained by productivity differentials is smaller than its unexplained part. This suggests that the data available do not fully account for the behaviour of earnings and/or a substantial amount of female discrimination may exist. The reduction in the total gender wage gap may be attributed to either an increasing appreciation of female educational attainments and/or to the financial crisis in Cyprus in 2013, during which female workers with low remunerations possibly departed the labour force and the incomes of the individuals with the highest-paid jobs (mostly men) suffered a significant decrease.

Keywords: Gender wage gap, Blinder-Oaxaca decomposition, Cypriot labour market, culinary occupations.

1. Introduction

The wage gap between women and men has drawn considerable attention from national governments and joint committees within the European Union (EU), most predominantly since the implementation of the Equal Treatment in Goods and Services Directive of 2004, which states the prohibition of both direct and indirect sexual discrimination in the provision of goods and services in the EU. As a culmination of the EU's efforts in tackling the gender pay gap, on 20 November 2017 the European Commission adopted the 2017-2019 Action Plan – a broad and coherent set of twenty actions to be delivered in the following two years (European Commission, 2018).

In Cyprus, harmonisation with the Acquis Communautaire has led to the implementation of several new pieces of legislation that forbid discrimination against women. This resulted in the formation of monitoring bodies that are in control of the enforcement of these legislations. Despite the fact that initially the country had been consistently compared unfavourably to other European Union members concerning the extent of the gender earnings differentials, according to the latest data published by the statistical office of the

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European Union (Eurostat), in 2016 the gender pay gap in Cyprus was considerably below the EU average and it is steadily decreasing (Eurostat, 2016).

This paper examines the gender wage gap in the culinary sector of Cyprus, which (along with the hospitality sectors) comprises the main pillars of tourism. For many decades, the tourism industry has been one of the major sources of income and a driver of economic growth in Cyprus. In addition, it has played a key role in the island's recent recovery (EIB, 2017). However, it has been noted that endogenous factors such as gender discrimination in the workplace may impede the competitiveness of the Cypriot tourist product and contribute to the slowdown of the economic activity (*Clerides and Pashourtidou, 2007*).

The current study uses data from the Structure of Earning Survey with the intention of decomposing the total gender pay gap into a component explained by workers' differences in observed productivity-related characteristics and a component due to differentials in the returns to such characteristics that may be affected by unobservable elements. These unobserved earnings determinants may include employers' wage discrimination and the workers' labour force participation decisions.

The remainder of this paper is structured as follows: Section 2 provides background information on the gender wage gap in Cyprus and the EU, including proposed measures against it; Section 3 describes the Structure of Earnings Survey data; Section 4 analyses the econometric methodology used; Section 5 presents the estimation results and Section 6 concludes.

2. Literature Review

This section briefly summarizes the literature on the gender wage gap in Cyprus, and compares it with the findings in other EU economies. It also explores the proposed measures and the existing policies against gender discrimination. Unless otherwise stated, the gender wage gap mentioned in the current section is the *total* gender wage gap, defined as the difference between the average gross earnings of men and women expressed as a percentage of the average gross earnings of men. This is also known as the 'male wage premium' and its calculation does not account for factors which may explain to an extent the observed wage differentials between women and men (e.g. differences in productivity characteristics, such as education and specialized skills). When the effect of these observable characteristics is removed, then the gender wage gap becomes the *adjusted* gender wage gap, which consolidates some of the factors which may explicate (to a certain degree) the observed male-female wage differentials.

2.1 The gender wage gap in Cyprus

One of the first studies involved in the investigation of the gender wage gap in Cyprus is the research paper of Christofides and Pashardes (2000). Their study infers through the utilisation of data derived from the Cyprus Household Budget Survey (HBS) that in 1991, the average female weekly wage in Cyprus constituted 60% of the male wage. Only 60% of this wage differential is explicable by the differences in the observed productivity characteristics of the two genders, leaving an adjusted gender wage gap equal to 24% (=40% x 60%). The biggest part of the explained wage gap is attributed to the industry effects, leading to the suggestion of a high proportion of women in economic activities and/or

occupations offering low wages (e.g. sales persons) and low proportion of women in sectors and/or occupations with high remuneration (e.g. managers).

This occupational segregation is also evident in the study by Panayiotou (2006), a research study commissioned by the European Union to evaluate the gender wage gap in Cyprus from a policy perspective. Panayiotou (2006) speculates that the gender wage gap is due to the fact that female workers in Cyprus tend to be concentrated in a small number of poorly paid occupations, such as the services sector (e.g. hotels and restaurants), while male workers generally prefer occupations in sectors of economic activity with higher expected returns, such as construction and trade. In addition, most of the professions that women choose to opt for do not offer opportunities for career advancement (e.g. hairdressers, secretaries and nursery assistants). This effect is known as a 'sticky floor'. Also, women have difficulty in pursuing highly paid positions, such as managers or directors, an effect known as the 'glass ceiling'. The author also suggests that the gender pay gap in Cyprus may be attributed to the absence of stern laws against discrimination; or due to a low employment rate for women; a lower educational attainment for women; a high rate of part-time employment by women or a large gap in the average number of hours worked between men and women.

Christophides and Vrachimis (2007) used data from the Cyprus Household Budget Survey of 1990/91, 1996/97 and 2002/03 in order to investigate the determinants of the Cypriot gender pay gap and examined its course throughout the period 1990-2003. Their empirical results demonstrate a downwards trend in the male wage premium, which went from 57.2%, in 1991, to 31.3%, in 1997, and then to 26% in 2003. In accordance to the study of Christofides and Pashardes (2000), a substantial part of the gender gap in 1991 could be explained by the more favourable productive characteristics for men. In both 1997 and 2003 their results indicate a decrease in the adjusted gender wage gap, which indicates either a decrease in immeasurable productivity characteristics or that discrimination against women in the labour force is reduced. The authors also performed quantile regression analysis, which indicates an increase in the wage gap at the 90th and 95th percentiles (which may reflect 'glass ceiling' effects) and that a smaller proportion of the individuals at the bottom of the distribution are women (which may reflect a deterioration of the 'sticky floor' effects).

Not a lot of studies are performed to investigate the gender wage gap in particular sectors of the Cyprus economy. However, a worth mentioning study with a similar scope and data set with the current one is the research conducted by the Cyprus Labour Institute (INEK-PEO) in an attempt to contribute to the formation of policies effectively aiming to reducing the gender pay gap in Cyprus. This research (INEK-PEO, 2016) is carried out within a network of transnational cooperation and it focuses on the hotel industry of Cyprus, for several reasons. One of the most important reasons is that hotels constitute one of the main employment sources in Cyprus, while at the same time they are characterised by high female employment rates. The statistical data used in INEK-PEO (2016) study originate from the Structure of Earnings Survey of 2010. The sample used includes only two culinary occupations, namely cooks and kitchen helpers.

The results of the study indicate that in those professions there is distinct gender segregation, since, in the occupation of cook, women managers are non-existent or marginal, while the occupation of kitchen helpers is clearly dominated by women. The findings also suggest that the remuneration for a woman is higher than that of a man with the same characteristics in most of the occupations in the hotel industry (including cooks) and this is attributed to the implicit skills which women develop so that they can succeed in male-dominated professions. It could also be attributed to a kind of natural selection which allows

only those female employees which possess these implicit skills to remain in such a male-dominated environment.

2.2 The gender wage gap in the EU

The literature on the gender gap in the EU is, of course, enormous. The papers which adopt a cross-country perspective include the study of Blau and Kahn (1996), which shows that eight European countries have a lower gender gap than the US and they attribute this to higher female wages in Europe for low earners. Newell and Reilly (2001) focus their analysis on the gender wage gap in EU members which used to belong to the Eastern Block and conclude that the gender pay gap in those countries does not exhibit an upward trend after their transition to capitalism.[1] Plantenga and Remery (2006) examine the gender wage gap for 24 EU members and survey policies that aim to reduce this gap. Rubery (2002), who examines these policies and targets, concludes that concrete objectives and time frames are needed in that direction.

Nicodemo (2009) focuses on the extent of the wage gap in a sample of five Mediterranean EU countries in the period 2001-2006 and finds a positive wage gap in all countries, in both time periods, the greater part of which cannot be explained by observed characteristics. Arulampalam et al. (2006) examine the gender wage gap in 11 European countries for the years 1995-2001 and their results indicate that the gap widens toward the top of the wage distribution in most of countries and, in a few cases, it also widens at the bottom of the distribution. They conclude that the differences in family and work reconciliation policies and wage setting institutions across EU countries may account for the variation in the wage gap.

The first study to investigate the extent to which the adjusted gender gap may be related to country-specific policies and institutions is Christofides et al. (2013). Using data from the EU-Statistics on Income and Living Conditions (EU-SILC), the authors examine the gender wage gap for a set of 24 EU members for 2007. Their results indicate that the gender wage gap varies considerably between countries, with the Republic of Cyprus being the country with the highest gender pay gap across the EU. However, Cyprus has indicated considerable improvement in the subsequent period, since, according to Eurostat, its gender pay gap dropped from 16.1% in 2011 to 14% in 2015 and to 13.9% in 2016. As a result, it is currently below the adjusted gender pay gap in the EU, calculated as 16.2%. Across EU members, the gender pay gap in 2016 ranges from just over 5% in Romania and Italy, to more than 25% in Estonia.

2.3 Measures and policies for narrowing the gender wage gap

According to a study carried out by the Cyprus Ministry of Labour, Welfare and Social Insurance (2007), tackling the pay gap should include specific policy measures, such as actions aiming towards the harmonisation of work and family life of female workers, as well as wider policy measures, targeting directly to the elimination of gender discrimination and the abolition of gender stereotyping. Such measures include (a) equal pay legislations against direct and indirect wage discriminations, (b) equal opportunities policies, in order to

[1] Alfarhan (2010), on the other hand, finds that in the former East Germany the gender wage differentials were increasing during 1999-2006, mainly due to changes in human capital endowments (particularly worker's potential experience), changes in the gender distribution across industries, company sizes and occupational positions and to changes in discrimination in the returns to job-specific training.

facilitate women's continuous employment (e.g. in case of pregnancy) and to combat the gender occupational segregation, and (c) measures towards the improvement of working conditions in the occupations with the highest concentration of female employees.

Cyprus legislation has already been expanded and upgraded, with a number of National Action Plans (NAPs) and strategies that have been developed to address gender inequality and specific issues that directly relate to it. These include the National Action Plan on Social Protection and Social Inclusion (2008-2010), the National Action Plan against Trafficking in Human Beings (2010-2012), the National Action Plan on the Prevention and Combating of Violence in the Family (2010-2015), and the National Action Plan on Equality between Women and Men (2007-2013). Those NAPs were developed in line with the Acquis Communautaire, in order to provide the baseline required for the implementation of equal treatment between men and women in the labour force of the country (*European Parliament, 2012*).

The NAP on Equality between Women and Men is the most significant policy document on gender equality in Cyprus, and was initiated by the National Machinery for Women's Rights (NMWR), of the Ministry of Justice and Public Order and adopted by the Council of Ministers in August 2007. It incorporates a holistic approach to gender equality addressing six priority areas, namely: employment, education, decision-making, social rights, violence against women and gender stereotypes. The development of the National Action Plan was developed in close collaboration with all government departments and local authorities as well as women's organizations and NGOs.

As regarding the Acquis Communautaire, the European Commission is in close cooperation with the Member States, the European Parliament and the European Social Partners in order for the observed gender pay gaps to be reduced to the minimum. In addition, the European Pact for Gender Equality has made its priority the reduction of gender wage gaps, by encouraging action by Member States and trade unions in favour of an 'equal pay for equal work' environment in the EU.

The actions implemented by EU Member States in order to reduce the wage gap include policies oriented towards gender equality, encouragement of continuous employment of female workers and reduction of gender occupational segregation. EU policies adopted in the same direction include measures for the minimisation of wage inequality in the labour market and the improvement of remunerations in female-occupied professions. On 20 November 2017, the European Commission adopted Action Plan 2017-19 (European Commission, 2018) in order to address the wage gap in the EU with a broad and comprehensive set of actions, including an evaluation of each Member State with regard to its application. It is expected that with the implementation of the European program for the elimination of the pay gap in Cyprus, its gradual elimination will follow.

3. Data

The data for this study are derived from the Structure of Earning Survey (SES) of the Statistical Service of Cyprus, a series of quadrennial surveys, conducted under regulations imposed by the European Council and the European Commission. The aim of these surveys is to provide accurate and harmonised data between EU Member States and Candidate Countries, for policy-making and research purposes. In Cyprus, the survey was conducted for the fourth time during 2015, with 2014 being the reference year. Data are used from only the latest two surveys (2010 and 2014), since changes which occurred in the SES

questionnaire throughout this period deem the latest two surveys more comprehensive with respect to both the coverage and the objective than the ones previously conducted (2002 and 2006).

The SES reports a wealth of information about the personal characteristics of each employee, including age and education. It also includes information about the enterprise in which the individual is employed, such as principal economic activity, size and the sector (i.e. public or private). In addition, it provides data on the individual's earnings, hours paid and shift work payments. Therefore, SES gives detailed and comparable information on relationships between the level of remuneration, individual characteristics of employees (gender, age, occupation, length of service, highest educational level attained, etc.) and their employer (such as economic activity and size).

TABLE 1

Characteristics of Workers by Year and Gender

SES	2010		2014	
Sample Averages	Men	Women	Men	Women
Monthly Earnings (€):				
Total Payments	1724	1141	1424	1223
Overtime Payments	56	39	2	14
Shift Work Payments	51	24	11	17
Monthly Hours Paid:				
Total Hours	177	176	181	179
Overtime Hours	6	5	0	2
Normal Hours	171	171	181	177
Age (years):	38	44	37	45
Length of Service (years):	7	6	4	6
Managerial Position:	12%	1%	9%	3%
Temporary Contract:	3%	3%	31%	25%
Cypriot Citizenship:	65%	56%	63%	65%
Employment Sector:				
Private (#)	73%	82%	94%	89%
Public	27%	18%	6%	11%
Educational Level:				
Elementary School	5%	14%	2%	8%
High School	5%	10%	7%	13%
Lyceum/Techn. School	55%	65%	48%	61%
Post-secondary School	3%	1%	4%	1%
College	30%	9%	31%	13%
University	2%	1%	7%	3%
Postgraduate Degree			1%	1%
Occupation:				
Fast-food Preparer (#)	4%	8%	5%	3%
Kitchen Helper	34%	65%	30%	53%
Cook	50%	27%	53%	43%
Chef	13%		12%	1%
Number of Observations:	243	293	343	360

Source: Author's calculations using the Structure of Earnings Survey (SES) data. The sample consists of full-time employees in culinary occupations, who do not participate in the ownership of the enterprise of their declared employment. (#) denotes characteristics not included when estimating the Mincerian models (i.e. consist the 'reference' group).

However, SES does not report the participants' total working experience. Research on human capital emphasizes that on-the-job training can be as important source of labour market skills as formal schooling. Thus, any event that interrupts one's career reduces that person's potential to acquire job skills and, in that manner, to increase his/her earnings. Since career breaks are more frequent among women rather than men (due to birth and child care), the SES data exclude a very important wage determinant and a potential driver of the gender pay gap (Mincer and Polachek, 1974).

The classification of the occupations in SES is based on the International Standard Classification of Occupations ISCO-08 of the International Labour Organization (ILO). Based on ISCO-08, the following four culinary occupations are identified in the SES data, namely: (a) Fast-food Preparers, (b) Kitchen Helpers, (c) Cooks and (d) Chefs. The data used in this study are observations on individuals employed on full-time basis in the occupations listed above, who are not also owners in the enterprise of their declared employment. Part-time employees and self-employed persons are excluded from the sample due to the difficulty involved in obtaining their full-time equivalent earnings out of the information they declare.

The analytical sample drawn from the SES of 2010 consists of 536 observations, out of which 243 (45%) are men and 293 (55%) are women. The 2014 sample consists of 703 observations, out of which 343 (49%) are men and 360 (51%) are women.[2] Table 1 contains the average values of basic characteristics of employees, such as earnings, hours paid, age, tenure at the current employer, citizenship, level of education and occupational group, by year and gender.

As can be seen from Table 1, women employed in culinary occupations are older, on average, than their male co-workers, with their age difference increasing from 6 years in 2010 to 8 years in 2014. In terms of tenure at the current employer (i.e. length of service in the same enterprise), male workers seem to possess an advantage of one year in 2010, in comparison to their female counterparts. However, this is overturned in 2014, with the female employees having an advantage of more than two years of length of service at their current employer from their male colleagues.

The managerial and/or supervisory positions in the food and beverage sector in 2010 seem to be dominated by men, something which strongly suggests the existence of a 'glass ceiling' phenomenon, i.e. women in culinary occupations facing difficulties in being promoted to higher positions. This is consistent with the findings of INEK-PEO (2016). However, men with managerial/supervisory duties fall as a percentage in 2014, while the corresponding percentage in women increases, suggesting a slight moderation of this phenomenon. In addition, male workers have longer working shifts and overtime hours than their female colleagues, in 2010, something that is also overturned in 2014, with women outperforming men in both shifts and overtimes.

With regard to the type of contracts, male workers do not seem to possess an advantage over their female colleagues in 2010, since the percentage of employees working on a temporary basis is equal to 3% in both genders. However, this is overturned in 2014, with the share of female employees working on definite duration contracts increasing to 25%, while the corresponding percentage in men rises to 31%.

[2] The sample size may seem remarkably small compared to other studies performing this type of research. However, the scale of the Cypriot economy renders the sample size of the current study quite representative. The population of the Republic of Cyprus (in the government-controlled areas) is 839,800 in 2010 and 847,000 in 2014 (Statistical Service of Cyprus, 2017).

The majority of workers in the sample (in both genders and years examined) are Cypriot citizens. However, the percentage of male foreigners employed in culinary occupations increases in 2014, while the percentage of female foreigners employed in culinary occupations decreases. This asymmetry in the inflow of foreign workers between 2010 and 2014 may be explained from that women, on average, have a weaker association with labour markets and lower participation rates. Therefore, the financial crisis may have had a larger impact on female immigrants compared to males. The percentage of culinary workers employed in publicly-owned enterprises declines between 2010 and 2014, in both genders. However, this reduction is more pronounced in the male workers.

With regard to the level of education, men in culinary occupations seem to have an advantage in 2010 over their female colleagues, with 32% of them having attended and completed programs in tertiary education, compared with only 10% in women. The supremacy of male workers in terms of education continues in 2014. Even though the percentage of female employees who have successfully completed tertiary education increases to 14% in 2014, it still remains at a much lower level than the corresponding percentage in the male employees (39%).

The last rows in Table 1 present the distribution of workers in the culinary professions examined (i.e. fast-food preparers, kitchen helpers, cooks and chefs) by year and gender. In 2010, most of the men in the sample (63%) are employed in the occupations where earnings are expected to be higher (i.e. cooks and chefs). This is not the case for female workers, where the corresponding percentage is equal to merely 27%. Therefore, in 2010, most of the women in the sample (73%) are employed in culinary professions where earnings are expected to be low (i.e. fast-food preparers and kitchen helpers). The most noteworthy observation, though, is that despite the fact that women in the sample are six years, on average, older than their co-workers of the opposite gender, none of them is a chef (i.e. the occupation where the earnings are traditionally the highest in the field).

In 2014, even though the percentage of men employed in the highest-paid occupations remains about the same (65%), the corresponding percentage for women increased to 44%. However, the majority of the female workers remain employed in low-paid occupations (i.e. fast-food preparers and kitchen helpers), while only a percentage of 1% of them are employed as chefs (i.e. the occupation with the highest expected earnings). This may reflect either a 'glass ceiling' phenomenon or that the female chefs have subordinate qualifications compared to men. (They are, on average, less educated, with slightly lower tenure at their current employer and significantly older.)

The actual earnings of the workers in the sample are summarised in the first rows of Table 1. Given the evidence of unequal distribution of men and women in the highly-paid occupations, the fact that average monthly earnings of men are higher than those of women in both of the years in the sample is hardly surprising. However, in 2014, the average earnings of women indicate an increase, while the average remunerations of men decrease. This results in the 'male wage premium' (i.e. the difference between gross wages of men and women, expressed as a percentage of the wages of men) to be reduced from 34% (= (€1724 - €1141) / €1724) in 2010, to 14% (= (€1424 - €1223) / €1424) in 2014.

TABLE 2

Earnings and Populations of Workers by Year, Gender and Occupation

SES	2010		2014	
Average Monthly Earnings (€)	Men	Women	Men	Women
Fast-food Preparers	973	825	1128	878
Kitchen Helpers	1257	1079	976	1086
Cooks	1828	1367	1478	1405
Chefs	2771		2428	1623
All Workers:	1724	1141	1424	1223
Total Number of Workers	Men	Women	Men	Women
Fast-food Preparers	9	22	15	10
Kitchen Helpers	82	189	104	190
Cooks	121	82	183	159
Chefs	31		41	1
All Workers:	243	293	343	360

Source: Author's calculations using the Structure of Earnings Survey (SES) data. The sample consists of full-time employees in culinary occupations, who do not participate in the ownership of the enterprise of their declared employment. Note that the last line of the first panel of the current table is identical to the first line of Table 1 and that the last line of the second panel of this table is identical to the last line of Table 1.

The first panel of Table 2 contains the average monthly remunerations of men and women, calculated separately for each culinary occupation in the sample. As expected, the monthly earnings of chefs are indicated as the highest in the field, in 2010, followed by the average remunerations of cooks and the salaries of the kitchen helpers – leaving the fast-food preparers as the lowest-paid occupation in the industry, in both genders. This is repeated in 2014, with the notable exception of the earnings of the fast-food preparers, which now appear higher than those of the kitchen helpers. This result is both surprising and hard to explain with the available information. Another surprising result is that, in 2014, the average earnings of women employed as kitchen helpers become higher than those of their male co-workers, marking the only case in the data set where the remunerations of men appear lower than those of women.

Additional information is provided in the second panel of Table 2, where the sample size is broken down by year and gender for each of the culinary occupations examined. As can be seen by comparing the first and second columns of Table 2 with its third and fourth columns, respectively, the number of male fast-food preparers increases by 67% between 2010 and 2014, while the number of their female colleagues decreases by 55%, in the same period. The number of male kitchen helpers increases by 27% between 2010 and 2014, with the corresponding number of female workers remaining constant. The number of male cooks increases by 51%, while female cooks almost doubled in that period. Male chefs increase from 31 to 41, while for women chefs their increase in number is only marginal.

4. Econometric Model

This section describes the econometric methodology used to decompose the gender pay gap in two parts: (a) the *explained* wage gap, attributed to observable productivity characteristics which may to an extent account for the total wage gap (e.g. tenure in the same enterprise

and level of education), and (b) the *unexplained* wage gap, which may be due to a combination of immeasurable characteristics (e.g. the likelihood that a woman will leave the labour force in order to raise her family) and gender discrimination. It follows that the terms 'unexplained wage gap' and 'adjusted wage gap' are identical.

The current study estimates the male-female wage gap observed in the culinary occupations of Cyprus, while controlling for differences in age, tenure at the current employer, education, employment sector, citizenship and occupation.[3] It employs the Blinder-Oaxaca decomposition, a method developed by Blinder (1973) and Oaxaca (1973) and which is based on Mincerian regression models of the form:

$$W_i = \alpha + \beta X_i + \varepsilon_i, \tag{1}$$

where W_i is the log of the earnings of each employee, α is the intercept of the regression, which in this case corresponds to the wage the employee would receive if all explanatory variables are equal to zero (i.e. a kind of occupation-specific minimum wage), X_i is a vector of explanatory variables which differ across employees (age, tenure, educational level, etc.), β is a vector of coefficients which account the degree that each of those variables affects the earnings of the employees (e.g. the increase in earnings associated with an additional year of service in the same enterprise) and ε_i is the residual term. Oaxaca and Blinder decompose the male-female wage gap by estimating Mincerian regressions separately for each gender:

$$W_i^M = \alpha^M + \beta^M X_i^M + \varepsilon_i^M, \tag{2}$$

$$W_i^F = \alpha^F + \beta^F X_i^F + \varepsilon_i^F, \tag{3}$$

where W_i^M and W_i^F are the logs of the earnings of male and female employees, respectively, X_i^M and X_i^F are the productivity-related characteristics (age, tenure, education, etc.) of men and women, respectively, β^M and β^F the returns to productivity-related characteristics of the male and female workers, respectively, and so forth. Subtracting equation (3) from equation (2) yields:

$$W_i^M - W_i^F = (\alpha^M - \alpha^F) + \beta^M X_i^M - \beta^F X_i^F + (\varepsilon_i^M - \varepsilon_i^F) \tag{4}$$

Adding and subtracting the term $\beta^M X_i^F$ from equation (4), rearranging it and calculating average values yields:

$$\overline{W}^M - \overline{W}^F = \beta^M (\overline{X}^M - \overline{X}^F) + \overline{X}^F (\beta^M - \beta^F) + (\alpha^M - \alpha^F), \tag{5}$$

[3] Potential labour market experience is imputed as 'age – years of schooling – 6'. However, it is not included in the estimations, since it is highly correlated with the age and tenure variables. Another concern with using such a measure in earnings regressions is that it may biases the effects of education and the rates of return to labour market experience. In that manner, it may underestimate the explained portion of the male-female wage gap (Regan and Oaxaca, 2009).

where $\overline{W}^M - \overline{W}^F$ is the total gender wage gap, $\beta^M(\overline{X}^M - \overline{X}^F)$ captures its share that is attributable to the differences in productivity characteristics between men and women (i.e. the explained wage gap), while $\overline{X}^F(\beta^M - \beta^F)$ and $\alpha^M - \alpha^F$ consist the portion of the wage gap that is unexplained by observed variables and could partly be a result of discrimination. Therefore, if employers assess the qualifications of men and women in exactly the same manner $(\beta^M = \beta^F)$ and if men and women are generally considered equal in the labour market $(a^M = a^F)$ then the last two terms of equation (5) are eliminated and any observed wage gap between men and women is only attributed to differences in skills and knowledge between the genders $(\overline{X}^M - \overline{X}^F)$. If, in addition, both genders have identical qualifications $(\overline{X}^M = \overline{X}^F)$ then the wage gap is completely eliminated.

5. Empirical Results

5.1 Mincerian Regressions

As previously described, the first step in conducting Blinder-Oaxaca decompositions is to run Mincerian regressions, for each gender separately. Mincerian models are named after Mincer (1974), who provides the analytical framework for examining the determinants of the employee remunerations, by applying regression models with earnings as the dependent variable and the proposed determinants as the regressors. In all models employed in the current study, the reference group (i.e. the group against which the effects of wage determinants are compared with) is consisted of persons employed in the private sector as fast-food preparers, do not perform managerial or supervisory duties, and are not holders of the Cypriot citizenship. The empirical results from the Mincerian regressions are presented in Tables 3 and 4. All estimations are performed using Ordinary Least Squares (OLS).

The results presented in the first two columns of Table 3 indicate that, in 2010, the length of service is a major determinant of earnings in the culinary sector occupations, with each additional year of tenure at the current employer increasing the earnings of male workers by 1.7% and those of female workers by 1.5%. The nationality also has a role to play, since being of Cypriot citizenship increases the earnings by 26.6% in the case of men and 22.9% in the case of women.[4]

[4] Since the Mincerian models have the general form of a semi-logarithmic regression, the earnings effects of dummy variables are calculated according to Halvorsen and Palmquist (1980), i.e. 100*[exp (*coef*) - 1], where *coef* denotes the corresponding coefficients estimated in Tables 3 and 4.

TABLE 3

Mincerian Regressions (Monthly Earnings)

SES	2010		2014	
Coefficients (β)	Men	Women	Men	Women
Age:	0.005***	0.001	0.006***	0.002
Length of Service:	0.017***	0.015***	0.015***	0.020***
Managerial Position:	0.117**	0.212	-0.058	-0.139
Temporary Contract:	-0.011	0.090	-0.031	0.085**
Cypriot Citizenship:	0.236***	0.206***	-0.009	-0.057*
Public Sector:	0.089*	0.161***	0.200**	0.213***
Educational Level:	0.032**	0.015	0.063***	0.060***
Occupation:				
Kitchen Helper	0.298***	0.101*	-0.050	0.208**
Cook	0.551***	0.224**	0.247***	0.430***
Chef	0.874***		0.639***	0.529*
Constant (α)	6.210***	6.515***	6.511***	6.396***
Number of Observations	243	293	343	360
R-squared	0.748	0.520	0.540	0.371

Notes: Table 3 presents results from estimating Mincerian models, for samples identified by column, i.e. regressions based on equations (2) and (3). The estimated coefficients express the effect of each characteristic on monthly earnings, as compared with the remunerations in the reference group (i.e. foreigners employed as fast-food preparers in the private sector, with no managerial/supervisory duties). (***) denotes significance at 1%, (**) at 5%, and (*) at 10%.

The remunerations in the public sector are 9.3% higher than those in the private sector, in the case of men, and 17.5% higher, in the case of women. Kitchen helpers receive 34.7% more earnings than fast-food preparers in the case of male workers, and 10.6% more in the case of female workers. Male cooks are getting paid 73.6% more than (male) fast-food preparers, while the remunerations of female cooks appear only 25.1% higher than those of fast-food preparers of the same gender.[5] The monthly earnings of chefs, all of which are men, are 139.6% higher than those of the corresponding (male) fast-food preparers.

[5] The finding of the Cyprus Labour Institute (INEK-PEO, 2016) that the remuneration for a woman cook is higher than that of a man with the same characteristics is absent from this study. This may be due to the fact that the INEK-PEO project focuses only on employees in the hotel industry, while the sample of the current study also includes persons employed in the restaurants sector.

TABLE 4

Mincerian Regressions (Hourly Wages)

SES	2010		2014	
Coefficients (β)	Men	Women	Men	Women
Age:	0.005**	0.001	0.006***	0.002
Length of Service:	0.015***	0.015***	0.015***	0.020***
Managerial Position:	0.101*	0.093	-0.120	-0.265**
Temporary Contract:	0.077	0.140*	-0.072*	0.076*
Cypriot Citizenship:	0.252***	0.214***	0.009	-0.064*
Public Sector:	0.038	0.151***	0.184**	0.245***
Educational Level:	0.029**	0.020*	0.088***	0.089***
Occupation:				
Kitchen Helper	0.152*	0.118**	-0.001	0.074
Cook	0.460***	0.268***	0.243**	0.287***
Chef	0.824***		0.659***	0.382
Constant (a)	1.155***	1.264***	1.226***	1.294***
Number of Observations	243	293	343	360
R-squared	0.742	0.584	0.371	0.317

Notes: Table 4 presents results from estimating Mincerian models, for samples identified by column, i.e. regressions based on equations (2) and (3). The estimated coefficients express the effect of each characteristic on the hourly wage, as compared with the wages in the reference group (i.e. foreigners employed as fast-food preparers in the private sector, with no managerial/supervisory duties). (***) denotes significance at 1%, (**) at 5%, and (*) at 10%.

What is most remarkable in the empirical results for 2010 is that certain productivity characteristics appear statistically significant (in determining the wages in culinary occupations), *only* in the case of male workers. Those characteristics include age of employee (with each additional year of age increasing the salaries of male workers by 0.5%), managerial/supervisory duties (which increase the earnings of males by 12.4%) and, most importantly, the level of education, which increases the earnings of male workers by 3.3%, but does *not* have a statistically significant effect on the remunerations of female workers.

The empirical results for the year 2014 are presented in the third and fourth columns of Table 3. They show that the length of continuous service in the same enterprise remains a major determinant of earnings in the culinary sector occupations. Each additional year of tenure at the current employer increases the earnings of male workers by 1.5% and those of female workers by 2%. The remunerations in the public sector are, in 2014, 22.1% higher than those in the private sector, in the case of men, and 23.7% higher, in the case of women. Cooks now receive 28% more earnings than fast-food preparers, in the case of male workers, and 53.7% more in the case of female workers. Male chefs are getting paid 89.5% more than male fast-food preparers, while the remunerations of female chefs appear 69.7% higher than those of female fast-food preparers. As with the estimates for 2010, the age of worker appears statistically significant in determining culinary occupations' earnings *only* in the case of men, with each additional year of age increasing their salary by 0.6%.

What is most remarkable in the empirical results for 2014 is that the level of education now appears a statistically significant earnings' determinant in *both* genders. Each educational achievement increases the earnings of male workers by 6.5% and the earnings of female workers by 6.2%. Performing managerial or supervisory duties (which in 2010 affected only the remunerations of men), in 2014 ceases to appear statistically significant in *any* gender. Working on a temporary basis (which in 2010 did not affect the earnings of any gender), in

2014 appears statistically significant in determining culinary occupations' remunerations, but only in the case of women. The wages of female workers on definite duration contracts appear 8.9% higher than those of female workers on indefinite duration contracts.[6] Also, the earnings of male kitchen helpers in 2014 do *not* have a statistically significant difference from the earnings of male fast-food preparers, while in the case of female workers the percentage difference is statistically significant and equal to 23.1%.

A number of papers indicate that using monthly earnings in the evaluation of the gender pay gap will result in its overestimation, when working overtime is involved. Those papers include Cha and Weeden (2014), who find that if men work, on average, 6% more overtime hours than women, then the gender wage gap will be exacerbated by around 10%. In Table 1 of the current study, the overtime work of men and women do not appear identical, in any of the years examined. Therefore, the gender wage gap is also calculated and decomposed using the hourly wages, calculated as: (total monthly payments – overtime payments – shift work payments) / (monthly hours paid – overtime hours paid).

The empirical results from running the Mincerian regressions using hourly instead of monthly remunerations are presented in Table 4. A comparison among the findings in Tables 3 and 4 indicates that the estimations derived from hourly earnings are quite similar, in terms of sign and significance, to the ones carried out from monthly remunerations. Therefore, the existence of shift work and overtime payments does not seem to produce a bias in the estimation and decomposition of the male wage premium in the culinary occupations. Given the absence of any significant difference between hourly and monthly earnings, the wage decompositions carried out in the following section are confined to the monthly earnings measure. The monthly remunerations models are preferred because of their relatively better performance in terms of goodness of fit.

5.2 Blinder-Oaxaca Decompositions

Table 5 provides the Blinder-Oaxaca decomposition results, calculated according to equation (5).[7] The total gender wage gap is defined as the difference between the male and female average log monthly earnings.[8] According to Table 5, the total pay gap is calculated as 0.367 log points, in 2010, with most of it (0.225 log points) attributed to differences in productivity characteristics. That leaves an unexplained (adjusted) gender pay gap equal to 0.142 log points. The total gender wage gap appears significantly lower in 2014, now being equal to 0.115 log points. About ½ of the total pay gap (0.052 log points) is attributable to differences

[6] An explanation of such an adverse result may be provided by applying the theory of compensating wage differentials in the context of fully competitive markets (Rosen, 1986). In this context, temporary employees should be better paid compared to permanent employees of the same characteristics to compensate them for the undesirability of the increased economic risk they incur.

[7] The Blinder-Oaxaca methodology is amended in Oaxaca and Ransom (1994), in order for the wage gap to be decomposed more analytically. However, previous studies of the gender pay gap in Cyprus (e.g. Christophides and Vrachimis, 2007) indicate that the analysis carried out using Oaxaca-Ransom (1994) provides results very close to the ones carried out from the much less arduous Blinder-Oaxaca methodology. Therefore, the current study employs the latter methodology, instead.

[8] This is actually an approximation of the gender wage gap, which may be more accurately estimated as '1 – exp (–dlog)', where dlog denotes the difference between the male and female average log earnings. For this reason, the estimates in Table 5 are similar but not identical to those resulting from Table 1. More specifically, from Table 1 the wage gap is estimated at 34% in 2010 and 14% in 2014, while in Table 5 the respective percentages become 37% and 12%.

in productivity characteristics, leaving an unexplained (adjusted) gender pay gap equal to 0.063 log points.

In terms of percentages, male workers are estimated to earn 31% [=1 – exp (-0.367)] more than their female colleagues in 2010. The share of the wage gap that is due to differences in productivity characteristics is 61.3%, i.e. 0.225 / 0.367, and analogously, the unexplained component of the wage gap is 38.7%, i.e. 0.142 / 0.367. In 2014, the male wage premium is estimated as 12% [= 1 – exp (-0.115)], which is significantly lower than its value in 2010. The share of the wage gap that is due to differences in productivity characteristics in 2014 is 45.5%, i.e. 0.052 / 0.115, and analogously the unexplained component of the wage gap is 54.5%, i.e. 0.063 / 0.115.

TABLE 5

Gender Pay Gap Decompositions

	2010		2014	
	Estimate	Percentage	Estimate	Percentage
	(1)	(2)	(3)	(4)
Log of Monthly Earnings (Men)	7.342***		7.158***	
Log of Monthly Earnings (Women)	6.975***		7.028***	
Total Differential	0.367***		0.115***	
Total Explained Effect	0.225***	61.3%	0.052*	45.5%
Total Unexplained Effect	0.142**	38.7%	0.063***	54.5%

Notes: Columns (1) and (3) report the results of the Blinder-Oaxaca decompositions. The explained part, the first term of equation (5), measures the component of the gender pay gap that can be explained by the differences between the male and female characteristics. The unexplained part, the second and third terms of equation (5), corresponds to the male advantage (or female disadvantage). Columns (2) and (4) report the explained and unexplained components as percentages of the total earnings differential. Three stars indicate significance at the 1%, two stars at the 5% and one star at the 10% level.

Hence, the total gender wage gap in the culinary occupations declines from 31% to 12% between 2010 and 2014. The unexplained wage gap also decreases, from 18.8% [= 38.7% of 31%] in 2010 to 5% [= 54.5% of 12%] in 2014. However, as a percentage of the total wage differential, the unexplained gender wage gap in the culinary sector actually increases from 38.7% in 2010 to 54.5% in 2014.

The reduction of the total gender pay gap reported in Table 5 can be the result of a fairer distribution of men and women in the occupations of the food and beverage sector. The calculations in Table 1 indicate that the percentage of women in the culinary professions with the highest expected payoffs (i.e. cooks and chefs) increased from 27% in 2010 to 44% in 2014. This positive development may be due to either a 'natural selection' of qualified women in professions that until recently were dominated by men, or the result of the national and international measures imposed in order to diminish the probable glass ceiling phenomenon.

The estimations presented in Table 3 indicate that in 2010 the level of education is not statistically significant in determining the earnings of female employees. However, this particular result is overturned in the estimations of 2014, with each additional educational achievement increasing the remunerations of women by 6.2%. This implies that a better recognition of the educational level of women by their employers, may have prompted in 2014 an upwards correction of their earnings. This increase is more evident in the cases of

kitchen helpers and chefs. As a result, the male wage premium substantially decreases over the period 2010-2014.

Other possible explanations for the reduction in the pay gap over 2010-2014 may be derived from the Cypriot financial crisis which culminated on the 25th March 2013, with a €10 billion international bailout by the European Commission (EC), European Central Bank (ECB) and International Monetary Fund (IMF). A study conducted by the Gender Equality Committee in Employment and Vocational Training (GEC, 2015) indicates that, as a result of the economic crisis, a large number of women chose to leave the labour force in order to become stay-at-home mothers. This suggests that a reason for the average earnings of women in 2014 appearing higher than those in 2010 (see Table 2) may be that the sample of 2010 includes women whose earnings were so low that they eventually resigned in order to take care of their families. This is also supported by the contents of Table 2, where in the culinary occupation with the lowest returns (i.e. fast-food preparers) between 2010 and 2014 the mumber of women employees decrease by 55%.

Another question of interest is whether the pay cuts implemented by employers as a measure against the financial crisis of 2013 affected the high-earners the most, which in 2010 happened to be men. Thus the earnings of men in the culinary occupations are reduced more than the ones of women and this contributed to the narrowing down of the gender pay gap in the food and beverages sector.

Since SES only provides data on the individual's gross earnings (i.e. before any tax deductions and social security contributions), yet another question would be whether measuring the wage gap using net earnings might had produced a different result. In the period 2010-2014, Cyprus implemented a number of measures to reduce the wage bill of the public sector, which included freezing emoluments of the existing civil servants and reducing the entire wage scale for new hires. Those fiscal consolidation measures affect high earners the most, thus creating inequalities which may be mitigated by the tax system (due to the progressivity structure of the tax/contribution rates). Using gross earnings does not allow these mitigations to be incorporated in the gender pay gap estimations.

5.3 Limitations of the study

Firstly, the derived wage gap decompositions may be misleading in the case when the Mincerian regressions do not include all the significant wage determinants, such as the workers' prior experience. As previously stated, SES does not include data on the employment history of each individual. This omission does not present a serious problem for those who are consistently employed through their adult lives, as is the case for many groups of men, since in that case potential experience (i.e. the estimated time since one left school) may be used as a proxy. However, under the traditional division of labour in the family, women have substantial interruptions in their careers and the use of proxies for experience (such as the estimated time since one left school) will underestimate gender differences in labour market qualifications and will produce biased estimates of the gender wage gap.

Secondly, for the Blinder-Oaxaca decompositions to correctly evaluate gender discrimination, the econometric models employed need to account for the possible effects from the existence of reservation wages. Women in the labour force tend to have higher reservation wages than their male counterparts, due to the fact that any potential employment will result on them spending less time with their families. Therefore, only women who are offered a wage higher than their reservation wage will choose to be

employed. This means that the samples employed in the wage gap decompositions may include only women with the highest earnings and therefore the gender pay gap will be underestimated. This issue is usually resolved with the application of Heckman correction, a method proposed in Heckman (1979). However, this method is not carried out in the present study, since the primary data do not allow it.

Thirdly, a large strand of literature indicates that another source of potential bias in estimating Mincerian models may be the occupational choice of the entrants to the labour market (see e.g., Dolton et al., 1989). The individuals wish their remunerations to include a premium for the risk associated with the choice of a particular occupation and this earnings risk premium is eventually incorporated in their wages, thus becoming a significant earnings determinant. By exclusively using workers from the culinary sector, the current study does not allow the estimation of occupational choice models, where this earnings risk premium is appropriately estimated (see, e.g. Jacobs et al., 2009).

6. Conclusion

The literature on the gender gap in the EU is vast and it records a wide variation in its size across countries and sectors of economic activity. The present study evaluates the gender pay gap in the culinary occupations in Cyprus, an EU member where the food and beverage sector has played a significant part in its economic development and recent recovery. The gender pay gap is estimated using the Structure of Earnings Survey (SES) data and it appears to significantly decrease in the period examined (2010-2014).

This reduction may be associated with increased recognition of the level of education of women from their employers or could be the result of the multitude of measures and policies against labour market inequality that have been implemented in recent years, both at a domestic and a European level. Another possible explanation is that the reduction in the pay gap can be attributed to the Cypriot economic crisis and its consequences. Those include low-paid women quitting their jobs to become stay-at-home mothers and high-paid men whose incomes dramatically decreased due to pay cuts implemented by their employers.

Empirical results obtained from Blinder-Oaxaca decompositions indicate that the adjusted pay gap (the part of wage differences that cannot be interpreted from observed productivity characteristics and is generally attributed to discrimination) increases, as a percentage, between 2010 and 2014. However, given the decrease in the overall wage gap being very substantial, the effect size of this increase in the proportion of the unexplained component is rather marginal. Additionally, the existence of an unexplained component per se does not necessarily prove labour market discrimination (especially since there is a lack of important variables capturing individuals' characteristics related to earnings). In this context, the policymakers should be satisfied with the observed reduction in the gender gap and they should attempt to safeguard the observed gains in the reduction of wage inequality through the aforementioned policies and measures.

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