Gender Pay Gaps and the Restructuring of Graduate Labour Markets in Southern Europe

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Abstract

In this paper we investigate whether education-job mismatches and growing occupational diversity are important explanatory factors of gender pay gaps among university graduates in Southern Europe (namely in Portugal, Spain, and Italy). In our analysis we use standard decomposition techniques and test the implications of controlling for selection bias. Our results indicate that overeducation and greater occupational segregation associated with the emergence of new graduate job profiles, are important determinants of earnings inequality. While our focus is on graduates' early careers, demonstrating that occupational assignment and selection into employment shape gender pay gaps among the highly skilled provides a more pessimistic view on the ability of educational expansion or equal pay legislation to significantly reduce gender pay inequality. Southern European economies are also particularly interesting to look at since there may be a greater degree of mismatch between the pace of higher education expansion and the changes in the job structure, making women particularly vulnerable to overeducation.

JEL Codes: J21, J24, J31

Keywords: Education mismatch, Gender Pay Gap, Graduate Employment, Job Structure, Selection Bias, Wage Inequality

1. **Introduction**

Traditional analyses of gender pay gaps (GPGs) (Blinder, 1973; Oaxaca, 1973) were initially motivated by the idea that a significant part of such gaps could be explained by different individual endowments – presumably determining productivity in the labour market. Such studies argued that *residual* gaps (due to differences in returns for similar characteristics) could be looked at as a measure of pure *discrimination* in the labour market. If not necessarily intended by these earlier contributions, this created the expectation – in European political circles for example (Rubery et al., 2005) – that GPGs would tend to disappear as women's endowments (education levels in particular, but also employment participation) converged over time. In parallel, remaining *discrimination* – in the sense defined above - could be fought through equal pay legislation.

While unadjusted GPGs have decreased, sizeable (adjusted) earnings differentials between genders have persisted (e.g., Blau and Kahn, 2006; Van der Meer 2008; Böheim et al., 2012). A pure human capital perspective of labour markets would continue to look at such residual gaps as a "black box" largely composed of differences in innate, motivational, or labour market commitment characteristics. By now, however, there is significant empirical evidence that the occupational - or job- structure of employment plays a critical role in explaining the persistence of GPGs (Blau and Kahn, 2002; Rubery et al., 2005), and that human capital variables – if strictly defined as education and experience levels (including career interruptions) – are increasingly marginal[1]. Triventi (2013) shows that the same is true across several European young graduate labour markets.

[1] See, for example, recent studies by Böheim et al. (2013, 2012) and Drolet and Mumford (2012) who highlight the role of workplace characteristics and gender segregation as key determinants of GPGs.

Thus, in this paper, we study the extent to which growing job diversification in graduate labour markets associated with higher education (HE) expansion, as well as the consequent education and skill mismatches, are important determinants of gender pay gaps (GPGs) among young university graduates in three Southern European countries (Portugal, Spain, and Italy). In particular, the paper analyses how new sources of occupational segregation, differences in the incidence and wage penalties associated with overeducation and overskilling, as well as broader measures of education-job mismatches might be important explanations of such gaps. Given that early career choices are also likely to influence future pay trajectories – as gender gaps widen over the life-cycle (e.g., Napari, 2009; Bertrand et al. 2010; Drolet and Mumford, 2012) – these may also be seen as further hypotheses for the persistence of GPGs over time.

The paper is organized as follows. Next section reviews recent literature on GPGs in Portugal, Spain, and Italy, with a particular interest in studies that look at specific segments of the labour market, namely the young, highly educated and better paid. We further review some recent legal and institutional aspects that help to contextualise the reduction or persistence of GPGs in these economies. Section 3 describes the methodology and the data used in the study. Section 4 is divided in three parts. It starts by looking at the *gendered* restructuring of young graduate labour markets in these three Southern European countries, providing an initial descriptive analysis of the increasing job heterogeneity, the overall level of pay inequality, and how widespread are overeducation and overskilling. Then, we describe the empirical methods used to assess the relative contribution of occupational diversity, education and skill mismatches, as well as further elements of demand-side heterogeneity to explain gender wage differentials. As a robustness check, we discuss the implications of taking

into account self-selection into employment in a final subsection. Finally, section 5 presents the main conclusions.

2. Gender Pay Gaps among the Highly Skilled in Southern Europe

Recent years have seen a renewed interest in the analysis of the transition of graduates into the labour market, especially following years of massive expansion of HE supply (e.g., Morrisson and Murtin, 2009; Brown et al, 2011). One aspect that received limited attention thus far in this respect is how differences in young graduates' early labour market careers may be intertwined with gender inequality. According to recent OECD (2014) data, average and unadjusted gender pay gaps are relatively small in Southern Europe (particularly in Spain and Italy) and have been decreasing over time. One important explanation for this wider trend of decreasing GPGs is the improvement of women's observed characteristics compared to men (e.g., women are now more educated than men on average). Young women also tend to outperform boys in their academic achievement (e.g., McDaniel, 2012) and now have even greater aspirations in terms of career's progression (OECD, 2012; UNESCO, 2010).

If we depart from the idea that the task content of jobs does not fully and automatically adapt to individuals' productive potential, we might expect that mismatches between education and work as well as pay inequality depend both on the pool of available jobs in a given economy and on the process of assigning workers to these jobs (Sattinger, 1993; Sattinger and Hartog, 2013). Furthermore, if changes in the demand for skills have an uneven impact across the job structure and its intrinsic task structure (Polavieja 2005) – by, for example, polarising demand for both high-level and low-level skills (Goos and Manning, 2007; Autor et al., 2008) –, the resulting increase in labour market heterogeneity opens up possibilities for further pay inequality.

This does leave the question of why women, and female graduates in particular, might be more vulnerable to overeducation/overskilling, or disproportionally assigned to less demanding or more unstable jobs. The first possibility may be regarded as a simple compositional effect. Women are now the majority of university graduates. If we assume that skill demand does not adjust automatically to this increase in supply, then it is possible that a higher share of women could be assigned to jobs further down the occupational hierarchy. This being the case, however, we would expect overeducation to carry significant earning penalties for both men *and* women. Similarly, while we could admit that new graduate jobs could carry significant penalties for both genders, we should not expect an increase in occupational segregation and lower returns due to the possible overcrowding of already feminised jobs.

A second possibility, therefore, is that women may have different preferences or embark in different processes of job-search favouring specific occupations. A stronger preference for flexibility in combining paid and unpaid work and women's higher opportunity costs associated with the unequal division of childcare and domestic work[2] could explain why men and women "willingly" choose different career paths (Becker, 1985). McGuinness and Sloane (2011) confirm that overeducated women are overall more concerned with finding jobs that provide more security, as well as jobs that allow a better balance between work and family life. Similarly, Swaffield (2007) finds out that different attitudes between women and men towards their job search has an effect on their wage, given that the former tend to make choices in line with household and family responsibilities, which are known to create most of the labour market constraints for women. Chevalier (2007) corroborates this argument and shows that these concerns shape the early career decision of females towards occupations that privilege less their

[2] Plantenga et al. (2009), for example show that Southern European countries were at the time of their study characterized by a very unequal division of care activities relative to the other European economies.

future career and wage progression. Goldin (2014) also supports that these differences in flexibility required by men and women have a high price in term of earnings, even within-occupations.

Southern European economies are a particularly interesting group to study the extent to which growing job diversification in graduate labour markets associated with HE expansion, as well as the consequent education and skill mismatches, are important determinants of GPGs given the more recent and faster *massification* of their higher education systems (e.g., Figueiredo et al. 2011, Wolfl 2013). Studying gender differences in early career choices in these three specific Southern European economies is also relevant as all the three economies may still be exposed to particular problems in the conciliation of work and family life[3]. This may be suggested by the unequal division of unpaid work (Plantenga et al., 2009) mentioned earlier but also by the very low fertility rates (the lowest in Europe) in these economies. We may expect, therefore, that the assignment to different jobs constitutes one further flexibility mechanism through which this conflict could be resolved.

In all the three countries considered, women increasingly outpace men in the race for higher qualifications. In addition, both the Italian and Spanish labour markets saw a remarkable increase in female participation rates in the last decades (e.g., Mussida and Picchio 2014a, Moral-Arce et al. 2012). Portugal, in turn, is characterised not only by very high female employment rates but also by long working hours[4] and a low incidence of flexible or family-friendly working arrangements among women and men (Casaca 2013). Abrantes (2013) argues, in addition, that Portugal integrated relatively early and consistently a gender equality dimension in national employment policies

[3] Furthermore, if young male and female graduates are be assigned to different jobs already at these early stages of their careers, these, in turn, can induce further differentiation in their future trajectories.
[4] Guner et al. (2014) also mention the traditional long and split working hours as a problem regarding the conciliation of work and family life in Spain.

assuming that labour market inequalities would decrease more slowly than changes in the family and domestic spheres. The opposite, if defined by the variables mentioned above, appears now to be the case. This explicit integration of gender equality in national employment or equality plans (generally through soft law) also happened in Spain and Italy. Perhaps more decisive, however, have been changes in school enrolment at early ages (particularly above three) and the public provision of such services, that increased significantly at least in Portugal and Spain (Guner et al. 2014). Similarly, initiatives to promote greater flexibility at work through, for example, the ability to reduce working hours or taking unpaid leave, constitute further important gender-related initiatives, namely in Spain and Italy[5].

However, the increase in female employment rates – and the greater visibility of gender equality in policy – does not necessarily translate into equality of employment status. It has been argued, in particular, that the broader search for more flexibility in labour markets and the creation of more atypical employment relationships appears to impact women to a greater extent and may conflict with gender equality objectives.[6] Casaca (2013), for example, emphasizes the high shares of women in non-permanent employment in Portugal and Spain, significantly higher than in other European economies. Similarly, for Italy, Mussida and Picchio (2014a) highlight the role of the creation of several atypical work arrangements (e.g., part-time jobs, seasonal jobs, and staff-leasing) and women's higher propensity to work in such jobs[7].

[5] These authors make reference, in particular, to the 1999 "Law to Promote the Conciliation of Work and family Life". They further argue that the introduction of cash benefits for working mothers and tax deductions for children played a role in increasing female employment rates.

[6] The same legal initiatives mentioned above can indeed promote further segregation in employment, particularly if they are exclusively directed towards women. Ferreira (2010) also points out that the move towards more decentralized wage bargaining systems in Southern Europe, traditionally characterized by centralized industrial relations, has the potential to increase earnings inequality.

[7] The authors mention the introduction of the Law No. 196/1997 and the Legislative Decrees No. 368/2001 and No. 276/2003 as important in this respect.

Therefore, greater occupational segregation can constitute one mechanism through which higher employment participation can co-exist with enduring gender inequality, particularly in the division of work and family or care responsibilities. Bettio and Verashchagina (2009) indeed show that occupational segregation has actually risen markedly in Spain and Italy, but also in Portugal from 1997 to 2007.[8]

While there are few studies that focus specifically on young graduate labour markets, recent studies on gender pay inequality in Southern Europe give us a detailed picture of the magnitude and determinants of GPGs by age, educational level, and across the wage distribution. Table 1 provides a summary of their main findings.

|Table 1 here |

In our view, there are four important conclusions derived from such studies. First, despite the considerable heterogeneity in the magnitude of GPGs across the wage distribution, the gaps have been decreasing for most of these segments. This trend, however, is mainly explained by improvements in women's observed characteristics. In recent decades, in particular, there were important compositional shifts in employment in these economies associated with women's ability to access white collar, relatively high skilled jobs (Addabbo and Favaro 2011, Picchio and Mussida 2011), or specific sectors (Bonhomme and Hospido 2013) due to their better education levels. This, we believe, reinforces the importance of studies focusing on trends within particular groups (e.g., according to workers' age or education levels).

A second related conclusion, therefore, is that such within-group analysis reports unambiguous evidence of the existence of both sizeable *unexplained* pay gaps in

[8] By contrast, there is some evidence that, at least in the case of Spain, changes in the legal framework may have a more significant impact in narrowing GPGs particularly in the public sector (see Alaéz-Aller et al., 2011).

Southern Europe and, perhaps more importantly, 'glass ceiling' effects, particularly among the highly skilled (Mussida and Picchio 2014b, De la Rica et al 2008)[9,10]. GPGs in this group appear to be particularly large in Spain, and especially so among the overeducated (see, for instance, Salinas-Jimenez et al, 2013).

A third lesson to be extracted from those studies is the fact that, while important differences in the characteristics of highly skilled men and women remain, those studies that display adjusted pay gap measures accounting for possible selection effects in the labour market (e.g., De la Rica et al. 2008, Mussida and Picchio 2014a and 2014b[11]) confirm or even reinforce the pattern identified above. There is, in addition, significant evidence that such adjusted GPGs have been much more stable over time in Spain and Portugal (e.g., Guner et al. 2014, Gonzalez et al. 2009), while they actually increased significantly in Italy (Mussida and Picchio 2014a).

Finally, there is overarching evidence that gendered occupational structures may still play a crucial role in the explanation of GPGs. This is particularly relevant if female workers remain concentrated in the lower steps of the occupational ladders (Carillo and Sapio, 2012), in female-dominated jobs, or in firms where wages tend to be lower (Vieira et al., 2003, Cardoso et al. 2012). This provides a relevant and more pessimistic angle to evaluate the potential effects of specific institutional and legal changes that were implemented in Italy, Spain and Portugal over recent years with the objective of reducing the magnitude of GPGs.

Hence, in the remaining of the paper we investigate whether these same trends apply to graduate labour markets. Indeed, while some studies argued that highly skilled

[9] The evidence is considerably more mixed regarding the overall pay gap as could be expected due to the mentioned changes in the composition of employment.
[10] There is considerable less evidence on differences by age and education for the case of Portugal. Gonzalez et al. (2009) show, however, that younger women still earned 12% less than men in 2005 with this figure being exclusively explained by differences in returns.
[11] Mussida and Picchio (2014) argue that selection matters except at the very top of the wage distribution. They also show that GPGs tend to rise over the life-cycle particularly at the top of the wage distribution.

women are those most likely to break into high-paying, previously male-dominated occupations, we explore whether new sources of occupational segregation remain important determinants of GPGs among the highly skilled.

3. **Data and Methods**

If occupational restructuring following the expansion of HE systems and graduates' distribution across the job structure are gender-biased[12], they can then become important determinants of GPGs. In this paper we specifically test the extent to which the emergence of new graduate jobs and their relative feminisation contribute to explain such gaps. [13] In addition, we ask if overeducation or overskilling, which arguably varies by gender (e.g., Voon and Miller, 2005) and may increase as a result of HE expansion, could equally be associated with gender pay inequality.

Our study combines information from two main datasets. To study the sources of wage inequality in Southern European graduate labour markets we use data from the REFLEX survey. The original project surveyed tertiary graduates from 15 countries who had completed their studies in the academic year 1999/2000. The survey was conducted five years after graduation and has detailed information regarding individual's academic degree, demographics, past experience in the labour market, and current employment situation.[14] Besides the comprehensiveness of data regarding graduates' transition into the labour market, detailed information on wages are also made available in the dataset, which makes REFLEX data particularly suited to our analysis. We obtained a sample of 3203 employed individuals with complete data for

[12] Recent research shows that highly-educated women are, for example, more likely to be found in clerical jobs both in Italy and Portugal (Addabbo and Favaro, 2011; Figueiredo et al., 2011).
[13] By "new graduate jobs" we mean occupations in which graduates were a minority in the past (e.g., Elias and Purcell 2004)
[14] More detail about the REFLEX database is available at http://www.fdewb.unimaas.nl/roa/reflex/.

the variables included in our analysis. Table 2 summarizes the distribution of these individuals by gender and country.

| Table 2 here |

Additionally, we used data from the European Labour Force Survey (EULFS) to compile a matrix of detailed ISCO 2-digit*NACE 1-digit jobs.[15] We have then applied hierarchical cluster analysis to these data, in order to construct a typology of jobs for each country under analysis[16] based on three job-specific characteristics:

i) The share of graduates from the 40-59 age cohort, which measures the graduate skill intensity of each occupation. We use an older age cohort to distinguish between occupations that already had a high proportion of graduates in previous generations (*traditional graduate jobs*) from those that had not (*new graduate jobs*) (see, for instance, Elias and Purcell, 2004).

ii) The ratio of the proportion of graduates from the 25-39 age cohort over the proportion of graduates from the 40-59 age cohort. This indicator captures intergenerational changes in skill intensity and is the key variable to spot occupations responsible for the occupational restructuring and further heterogeneity in graduate labour markets.

iii) The relative presence of female workers in order to account for occupational segregation among male and female graduates.

We used a within-groups clustering method and the squared Euclidian distance to measure the distance between occupations. For each country, we have then identified three distinct clusters of occupations as the best and most distinct cluster solution. Table

[15] We used pooled data from 2001 to 2007, after removing occupations with a number of workers below Eurostat's minimum reliability thresholds. Even so, for each country, less than 1% of the observations were removed.

[16] The analysis was performed separately for each country, in order to account for potential country-level differences in graduate and female compositions of jobs, considering the different degrees of HE expansion in these countries.

3 shows that, for all the three countries, the final cluster solution is able to: i) isolate jobs with significant intergenerational differences in skill requirements (Traditional versus New Graduate Jobs); and, within the latter, to, ii) isolate those where women are still a minority (*New Male Graduate Jobs*). This allows us to capture gender differences in graduates' assignment to new graduate occupations that would be otherwise disguised if we simply used ISCO 1-digit occupations as dummies in the regressions (see table 4).

| Tables 3 and 4 here |

While we use this typology of jobs to describe the restructuring of graduate labour markets, we argue that this restructuring had a decisive influence on the evolution of self-perceived overeducation and overskilling. Regarding the former concept, the REFLEX questionnaire explicitly asked graduates which level of educational attainment they thought was more appropriate for their jobs. We defined overeducated individuals as those employed in jobs whose required level of education was lower than that achieved by the worker at the time of the survey. Regarding overskilling, the REFLEX survey asked graduates to rate on a 1-5 likert scale the extent to which they felt that i) their knowledge and skills were relevant in their current job and ii) their job demanded a higher level of knowledge and skills than those they owned by the time of the survey. Similarly to McGuinness and Sloane (2011), we defined overskilled (underskilled) workers as those providing a response of 1 to 3 (4 to 5) to the first (second) question.

Table 5 reports the incidence of overeducation and overskilling in each type of job. Both mismatches are indeed more frequently found among workers employed in NGJ, particularly in Spain and in NFGJ in Portugal. Workers employed in TGJ, instead,

tend to suffer relatively more from undereducation and underskilling.[17] The increasing diversification of graduate job profiles (and the declining relative importance of TGJ), therefore, increases the prevalence of overeducation and overskiling. While this does not necessarily mean that such new graduate jobs are less skill intensive, it means at the very least that their demand profile is "different", resulting in potential education-job mismatches. In this regard, Elias and Purcell (2004) show that such new graduate jobs require a more intensive use of "strategic and managerial" as well as "interactive skills".

| Table 5 here |

4. Empirical Results

4.1. Gender Pay Gaps and the Gendered Restructuring of Young Graduate Labour Markets in Southern Europe

Despite their traditional educational lags relative to other European economies, access and completion of HE among the younger cohorts have increased very rapidly in the three countries analysed. Figure 1 presents EULFS data that confirm the existence of striking differences between the qualification levels of men and women from the 25-39 age cohort in all the three countries. Portugal and Italy have seen a particularly quick increase of the proportion of graduate women relatively to men over the years.

| Figure 1 here |

These numbers tell us little about how that quick massification compares with other European economies and, in particular, how the risk of overeducation increased as a result of that process. Figure 2 maps the relationship between these two dimensions for men and women, measured, respectively, with EUFLS and REFLEX data. Southern European graduates (and particularly those in Italy and Spain) appear to face a relatively

[17] Results for undereducation and underskilling are available upon request.

high risk of overeducation. Moreover, women in Portugal and particularly in Spain face a much higher risk of overeducation relative to the mean tendency implicit in the regression line (as well as to men)[18].

| Figure 2 here |

Table 6, on the other hand, looks at occupational restructuring and maps the changes in the distribution of graduate jobs separately for men and women using EULFS data. In all the three countries the share of graduates working in TGJ has decreased. This pattern, however, differs considerably by gender. For women, this decrease has been compensated by an almost one-to-one increase in the proportion of women employed in NFGJ; for men, this increase was split between the two types of New Graduate Jobs. These data suggests that female graduate labour markets became more segregated in gender terms over this period. In other words, young female graduates in both these economies showed a greater tendency relative to men to occupy already highly feminised jobs. Table 7 shows changes overtime in the level of occupational segregation using the standard Index of Dissimilarity measure to confirm this idea[19].

To better understand these dynamics in the labour market, we looked at the most representative occupations in each cluster (see also table 4). Some of the most representative occupations in NFGJ included associate professional occupations in more feminized areas such as health and social work, public administration, education and teaching, as well as clerical positions. NMGJ were more likely to be found in industrial sectors, finance, and retail, as well as in managerial jobs in small firms. Gender

[18] Recent evidence for the private sector in Portugal also documented a rapid increase in formal overeducation especially among women (Figueiredo et al., 2011).

[19] The index of dissimilarity calculates the proportion of the workforce that would need to change occupations to remove segregation – considering existing differences in the male and female share of employment and a given definition of occupation. Over the many measures available to measure occupational segregation, it has the advantage of being immune to changes in the overall female share of employment (Emerek et al. 2001) which is clearly relevant in our calculations.

segregation in young graduates' assignment to *new graduate jobs* constitutes, therefore, one possibly important initial mechanism through which GPGs begin to materialise at these early career stages.

| Table 6 and 7 here |

Table 8 describes men and women in the sample, by country. The variables included in the table comprise a wide set of individual and job characteristics that will be controlled for in our empirical analysis of the GPGs in the next section.

Overall, the data confirm the existence of substantial wage differences among female and male graduates five years after graduation. Gender gaps were considerably larger in Portugal (0.24 log points) and relatively lower in Spain (0.11 log points). Male and female graduates differ, for example, in their academic profile. Whereas women have mostly graduated in Social Sciences, Education and Health fields, above 40% of males have an academic degree in STEM (Science, Technology, Engineering and Mathematics) fields. Regarding job characteristics, women are more frequently employed in the public sector. There are relatively more men occupying supervision positions and working in large-sized firms. Women, in contrast, show shorter job tenures and are more frequently employed in fixed-term or temporary jobs.

REFLEX data confirm that job distributions and education mismatches are also clearly gender-biased. As expected, women are disproportionally found in NFGJ, while male workers, on the other hand, are better represented in NMGJ and TGJ. These differences are particularly significant in Spain. Overeducation (undereducation) is also more frequently reported by women (men), and the differences are especially remarkable in Portugal. Furthermore, most of these differences between men and women seem to have increased over time (when comparing the first and the current jobs), particularly regarding education mismatches. Finally, large periods spent in

unemployment – which, among graduates, may be seen largely as reflecting periods of discontinuity in labour market experience - were also more frequently reported by women.

|Table 8 here |

4.2. Demand-side factors as determinants of gender pay gaps in Southern Europe.

We started by estimating a standard Ordinary Least Squares (OLS) regression for hourly wages (in logs) separately for men and women.[20] For each individual i, we relate the log of hourly wage W_i to the set of explanatory variables included in vector $\boldsymbol{X}$ (and already summarized in Table 8):

$$\text{Ln } W_i = \alpha_0 + \boldsymbol{X}'\boldsymbol{\beta} + \varepsilon_{1i}, \quad (1)$$

which include i) individual's demographic characteristics; ii) individual's academic profile; iii) characteristics of the current employer and job; iv) education and skill mismatches in the current job; v) type of job (according to the typology of jobs previously constructed); vi) previous labour market histories (namely concerning their first job after graduation) and vii) previous unemployment experiences. We estimated pooled OLS regressions with controls for country-level differences as well as separate estimations by country.

We started with a baseline model including only the variables commonly taken into account by the majority of the studies on gender wage gaps, namely demographics, individuals' academic profile and the characteristics of the current employer and/or current job. We then extended this first model by evaluating the significance of education and skill mismatches in the current job[21] (Model 2), the type of current

[20] The use of hourly wages is largely preferred in the literature, given that more aggregate measures of earnings fail to control for the differences between men and women in the length of the work week or in labor market interruptions.

[21] Even if correlated, overeducation and overskilling are different concepts since formal overeducation may not necessarily translate into genuine overskilling in view of a job's particular skills requirements

occupation (Model 3) and the past trajectory in the labour market (namely graduates' first job and exposure to periods of unemployment) (Model 4). Finally, we estimated a global model including all the variables considered in previous specifications (Model 5). The results of this last estimation for the subsamples of men and women and for the different countries can be found in table 9.[22]

Our results show that our set of observable characteristics account for a larger share of the variance of women's earnings relatively to men, but also that there are still clear differences in the returns to the same observable characteristics for both genders. The family's educational attainment (namely that of the father in Spain) or the field of study seem to be important determinants of earnings only among women. Working in the public sector or in relatively large firms is also associated with a higher wage premium for women. By contrast, the penalty (relative to the mean) associated with a fixed term or temporary contract, or of a previous unemployment spell, is found to be higher for men (especially in Italy). , Failing to access traditional graduate-level jobs appears to result in a significant penalty for men in Spain and women in Portugal. Among new graduate jobs, only already feminized graduate jobs seem to result in significant wage penalties. Differences in the relative penalties of overeducation and overskilling are also large and significant, particularly in Portugal and Spain.

| Table 9 here |

The previous results suggest different patterns of allocation of men and women across the labour market. One needs to understand, for example, why higher levels of

(Chevalier, 2003). In any case, here we are interested in their joint effect as measures of the mismatch between education and work and as proxies of the intensity of skill demand in the job.

[22] We have also estimated all the above specifications for the wage equation with the pooled data, including an additional control variable for gender. The results confirm that women earn significantly lower wages than men, even after controlling for several sources of heterogeneity at the individual, firm and job levels.

HE massification do not translate into lower earnings also for men with equal observable characteristics (such as a degree in the same area and with equally good grades). It is possible that men have other non-observed characteristics that we do not pick up here and which are worth following in further research. It is also noteworthy that the type of job occupied or the required level of skills in the job lead to significant penalties also for men. In other words, which jobs graduates are assigned to may play a decisive role, and compositional differences that follow from the higher levels of HE massification among women could be a decisive determinant of the pay gap.

In order to explore that possibility we used the standard Blinder-Oaxaca (1973) method to decompose the gender pay gap of 0.141 (in logs) previously identified in Southern Europe into two components: i) compositional differences measured by differences in the mean levels of the observed determinants of earnings, and ii) the differences in the returns of those characteristics on earnings. We first summarize the main results obtained from pooled gender pay gaps decompositions in Figure 3 for each of the sequential models estimated.[23]

| Figure 3 here |

Overall, half of the gap remains unexplained as only about 45%-50% of the gap could be attributed to observed differences in men's and women's characteristics and jobs. It must be said that this decomposition may be however sensitive to the discrimination structure imposed. In this case, we present the results obtained using the solution proposed by Neumark (1988).[24] We also identify which groups of variables are potentially more important to explain gender wage differences among recent graduates

[23] Detailed estimation results for all the models are available upon request from the authors.

[24] If wage discrimination was assumed to be only directed against women we would be able to explain 60% of the gender wage gap at most. Alternatively, assuming no discrimination of women and only positive discrimination of men, we could explain 47% of the gap. As these assumptions are recognized to be too restrictive, we preferred to follow Neumark (1988), who advocated the usage of the coefficients from a pooled regression over both groups as an estimate for the nondiscriminatory coefficients vector (see also Jann, 2008).

in Southern Europe. First of all, differences in the characteristics of current employer and current job (tenure, firm size, type of contract and type of tasks (e.g., supervision positions)) together explain 18% of the GPG (Model 5). Our main variables of interest add considerable detail to the role played by the job structure in determining earnings differentials – the type of occupation provides a very significant contribution to the explanation of the gap (11.5%), and further differences in the incidence of education and skill mismatches add 5.6% to the explained component of the differential. Accordingly, our results seem to reinforce the view that job heterogeneity plays a decisive role in explaining GPGs in graduate labour markets, an effect that may not be adequately captured by merely adding simple occupational dummies into wage regressions (Polavieja, 2005). Pay gaps decomposition models are, in this sense, very useful since they allow us to capture the joint effect of differences in job-related characteristics and heterogeneity in returns.

Furthermore, whereas differences in academic and demographic characteristics remain important explanatory factors to the GPG (8% and 5%, respectively), our results suggest that the former, in particular, are clearly mediated by the job structure since its explanatory power decreased once we controlled for the independent effect of job-related characteristics. The fact that the effect of the first job vanished once we controlled for current job characteristics also appears to indicate that there is a significant degree of correlation, and therefore continuity, between individuals' current job and first job. Finally, if female and male graduates had the same public-private sector employment, the gender wage gap would be even higher. The larger relative presence of women in public sector jobs offers a great degree of protection to women, explained by the higher average wages in this sector.

Figure 4, in turn, explores cross-country differences in the explained component of the gender gap using the full specification model and also controlling for selectivity into employment as a robustness check, an issue to which we return in detail in the next section[25]. For the three countries, observed differences among men and women regarding the characteristics of their jobs and employers were clearly the most important source of wage inequality. The characteristics of the firm and the type of occupation, in particular, were decisive predictors of GPGs across the three countries (actually accounting for close to 80% of the explained component in Italy and close to half of the explained component in Portugal and Spain, even before adjusting for selectivity into employment). Educational mismatches, on the other hand, contributed to explain a significant part of the wage inequality only among Portuguese and Spanish graduates, which highlights that overeducation is clearly not neutral from a gender point of view in these countries (see Figure 2).

Finally, we should emphasize differences across countries regarding men and women's academic profiles. In Portugal, gender differences in academic characteristics are already favourable to women actually reducing the overall earnings gap. For Spain and Italy, the opposing effect was found, with academic differences among men and women reinforcing the disadvantage of women. In Italy, however, the effect of academic characteristics seems to be highly sensitive to selection bias. Overall, our results seem to consistently indicate that GPGs are much more explained by occupational restructuring, jobs' and employers' characteristics, as well as education-job mismatches, than by academic and other individual-level differences. Further research should explore the extent to which this restructuring of graduates' employment

[25] The explained component of the raw GPG is, respectively for IT, PT and ES of 33.1%, 38.1% and 60.2%.

is leading men and women to jobs with significantly different task content, as differences across occupations seem to suggest.

| Figure 4 here |

4.3. Robustness Checks and Selection Bias

There is an increasing agreement that selection problems have important effects on results and should be considered in GPG studies (Stanley and Jarrell, 1998; Jarrell and Stanley, 2004; Weichselbaumer and Winter-Ebmer, 2005), including those focusing exclusively on university graduates (García-Aracil, 2007, 2008; Triventi, 2011). We have also argued already that women's initial careers may be more intermittent – including those of highly skilled – as they are exposed to a different set of incentives and opportunity costs regarding their participation in employment. The way through which selection into paid employment must be corrected is still a source of controversy (Neuman and Oaxaca, 2004; Fortin et al., 2011; Picchio and Mussida, 2011; Machado, 2012).

We started by analysing the potential effects of selection bias by departing from a wage regression for the pooled data (similar to that expressed in (1)), additionally including a dummy variable for women. We then extended it in order to take the selection effect into account (see appendix table 1 and 2[26]). Following Heckman (1979), the dependent variable W_i was only observed for individual i if the condition underlying the selection equation held. Formally, we have the following outcome equation:

$$W_i = \begin{cases} \alpha_0 + \boldsymbol{X}'\boldsymbol{\beta} + \varepsilon_{1i} & if\ y_i^* > 0 \\ - & if\ y_i^* \leq 0 \end{cases}, \quad (2)$$

[26] In addition to pooled results, we present separate results by country but concerning only our main variables of interest. Detailed results are available from the authors upon request.

And the following selection equation:

$$y_i = \begin{cases} 1 & if\ y_1^* > 0 \\ 0 & if\ y_1^* \leq 0 \end{cases}, \quad (3)$$

where $y_1^* = \delta_0 + \boldsymbol{Z}'\boldsymbol{\beta} + \varepsilon_{2i}$ denotes a latent variable for the unobserved utility of being in paid employment.[27] Sample selection problems arise given that ε_{1i} and ε_{2i} are possibly correlated and, in reality, those individuals not working by the time of the survey may be a self-selected sample. This is still valid, we believe, even in graduate labour markets where exclusion from paid employment can be simply transitory. In order to avoid identification problems, we use three exclusion restrictions (i.e. variables that are included in the selection equation but not in the wage (outcome) equation), namely whether or not each individual i) lives with parents; ii) lives with a partner; and iii) started looking for a job before the end of the graduation. We believe therefore that these are variables that influence the decision and the pattern of participation in employment but not necessarily wages.

In all the estimated models, except for Portugal, selection bias was found to be statistically significant. When controlling for such bias in the labour market, the wage penalty initially found for women was further reinforced, with the magnitude of the negative coefficient for the *Female* dummy increasing, on average, 4.4%[28]. This is evidence of an overall significant positive selection phenomenon in our sample, which means that those who decide to enter paid employment are more likely to have higher-than-average ability (comparatively to those who remain out of the labour market) and, consequently, above-average productivity and higher potential earnings. In other words,

[27] For the three countries under study, we identified 560 individuals that were unemployed and 369 individuals that were out of the labour force, for whom wages are not observed. We have tested the effects of selection using both sets of individuals and, alternatively, only the group of unemployed individuals. Though the results were not significantly changed in any of these analyses, in this paper we report the results for the latter case.

[28] The results in appendix table 2 also confirm the significant penalties associated with overeducation (in Spain and Portugal) and new female graduate jobs (in all countries) .

lack of correction of this selection bias leads to an underestimation of gender pay gaps, given that employed women have on average better attributes relative to those who are not. Table 10, in addition, shows the increase in gender penalties for the different countries. Our results indicate that positive selection was particularly pronounced among Italian graduates. Interestingly, in the case of Spain, this effect is smoothed when we account for the effect of overeducation and overskilling (models 2 and 5).

|Table 10 here|

As a second robustness check, we have further analysed how the previous gender pay gap decompositions would be changed after controlling for selection bias in the labour market. Following previous studies (e.g., Reimers, 1983; García-Aracil, 2007, 2008), we have accounted for selection bias in the decomposition of wage differentials by applying the standard decomposition formulas to the *adjusted* wage differential (i.e., the wage gap obtained after deducting the selection effect).[29] As expected, and in line with our previous finding of positive selection in the labour market, the adjusted wage differential among female and male workers in the three countries was found to increase, varying between 0.169 and 0.181 log points. We have then performed the same decomposition exercise to the six previous models in succession (using the pooled data), but now applied to the selectivity *adjusted* gender wage gap. Figure 5 summarizes the results for the pooled sample.

| Figure 5 here |

[29] According to Jann (2008: 19), this seems to be the most straightforward approach to account for selection bias in these decomposition analyses. An alternative approach consists in decomposing gender differences in the selectivity in the labour market into two components: endowments and discrimination, as conventionally done for other observable differences between men and women. However, the allocation of these differences to discrimination and endowments has not a unique and universally accepted answer (Neuman and Oaxaca, 2004).

As expected, the share of the adjusted gap that can be explained by women's and men's observed differences is now somewhat lower (between 26% and 36%, from Models 1 and 5, respectively, and if one accounts for the effect of negative contributions to the gap). Even so, the results remained consistent regarding the relative importance assumed namely by firm's and job's characteristics and graduates' type of occupation at the time of the survey. However, it is not possible to distinguish whether this difference in the gender gap comes directly from the changes in the occupation structure of the labour market, or from the different priorities/attitudes/motivations that men and women might have towards their careers when facing these changes in the occupation structure and when facing education and skill mismatches. Future research based on longitudinal data allowing to control for unobserved heterogeneity both at the individual and occupational levels might contribute to disentangle these effects. Access to richer family-related data (e.g., on spouse's position or job history in the labour market) might also allow to control for those different attitudes or motivations that men and women might have concerning their careers. We thus hope that these first results open new lines of inquiry and motivate further research on the topic.

Finally, the results show that education mismatches and periods of discontinuity in graduates' initial careers (proxied by periods of unemployment) also played a noticeable role. By contrast, individuals' differences in academic characteristics become negligible, especially when the type of occupation is controlled for. Figure 4 had already suggested this result for all the three Southern European economies under analysis, particularly in Italy. This again reinforces our earlier conclusion that the overall effects of academic differences are strongly associated with graduates' distribution across the job spectrum.

5. Concluding Remarks

In this paper we analysed how the emergence of new graduate occupational profiles, their relative feminization, as well as the degree of matching of graduates' skills and qualifications to their jobs requirements, contribute to explain gender pay inequalities in graduate labour markets. We used standard gender pay gaps decomposition techniques with new explanatory variables that provided greater detail concerning younger workers' initial transition into employment. Our results confirm that as more and more graduates move away from *traditional graduate occupations* - those which have always required a degree -, these restructuring processes are not neutral from a gender point of view. Young women seem to be considerably more likely to become overeducated (namely in Spain and Portugal) and the process of transition into employment led to greater gender segregation in graduate labour markets (most notably in Spain and Italy), with women who now occupy new types of graduate jobs mainly moving to already feminized jobs.

Moreover, while individual-related determinants of earnings (mainly the choice of field of studies) may also be clearly gendered, their effect on the gender pay gap (or earnings in general) appears to be strongly linked or mediated by the pattern of integration in the labour market (i.e., the type of graduate occupation, the level of gender segregation, and the match of qualifications and skills to the job). Our results also confirm that firm-level characteristics (firm size and ownership) remain important determinants of pay gaps even when controlling for such new patters of graduates' integration into the labour market (particularly in the case of Italy).

These findings thus call for further research on the specific task content of new male- and female-dominated *new graduate jobs*. It would be important to test, in particular, whether or not there are polarisation mechanisms at play, namely between

jobs that rely heavily on managerial and strategic skills and others that demand more interactive or communication skills. The composition of the NMGJ and NFGJ we identified in our work appears to suggest that possibility. Thus, it would also be important to investigate if female-dominated occupations do to some extent trade-off higher labour market temporal flexibility (for lower wages as to better accommodate women's historical dual role in society. This could indicate a wider explanation than that suggested simply by the higher education-job mismatches in Southern Europe due to the fast massification of HE supply and the limited transformation in job opportunities in these economies.

From a policy point of view, our results suggest that, as education-related differences between men and women become less relevant as determinants of GPGs, new sources of inequality may arise as the result of growing career heterogeneity in graduate labour markets. This aspect can stay beyond the reach of equal pay legislation if women disproportionally move to different jobs, choose more intermittent labour market careers, or stay out of employment altogether. Thus, our results give further strength to the need of looking to direct processes of gender discrimination in graduates' recruitment to male-dominated graduate jobs. Equally important, however, is to look at wider and more indirect processes of segregation that could explain why young highly qualified women choose or are forced to stay out of such areas.

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