

The Impact of Parenthood on the Gender Wage Gap – a Comparative Analysis of European Countries and Family Policies

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Abstract

We use cross-national data to assess how much children and the responsibilities related to them contribute to the gender wage gap, and how family policies affect this relationship. Our analysis is based on a decomposition that reveals what portion of the gender wage gap may be attributed to the existence of: (1) the motherhood wage penalty, (2) the fatherhood wage premium, and (3) the gender wage gap among childless individuals. Our findings suggest that in countries where female employment is low, the gender wage gap is small, and mostly driven by a high positive fatherhood premium. Among the remaining countries, variations are mainly explained by family policies. Countries with high childcare coverage and moderate length paid leaves report small, slightly positive motherhood wage gaps that play a small role in the overall gender gap. On the other hand, the highest motherhood wage penalty is found in countries where long leaves coexist with the low accessibility to childcare facilities, explaining approximately one third of the total gender wage gap.

Keywords: Family Gap, Gender Wage Gap, Family Policies

JEL codes: J13, J22

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1. Introduction

Previous literature has documented that having children may contribute towards lower wages for women and a slight wage premium for men compared to childless individuals. These phenomena are usually referred to as ‘the motherhood wage penalty’ and ‘the fatherhood wage premium’, or – more generally – ‘the family wage gaps’. Given that parenthood is found to positively affect men’s wages and negatively affect women’s wages, there are strong reasons to expect that it contributes to the divergence of men’s and women’s average wages, and consequently to the formation of the gender wage gap. This link between parenthood, wages, and the overall gender pay gap has been indirectly examined in the number of studies, e.g. Dolton and Makepeace (1986), Waldfogel (1998), Angelov et al. (2013). Recently, Cukrowska-Torzewska and Lovasz (2016) provided more direct evidence on the relative contribution of the parenthood wage gaps to the overall gender wage gap for two countries: Poland and Hungary. In this study, we further examine this issue for a large sample of EU countries, and compare the role of parenthood gaps in determining the gender wage gap in light of their most relevant institutional characteristics.

Both topics – gender wage gap and family wage gap – have been previously examined in a comparative perspective. The variation in the gender pay inequality across the countries has been attributed to several factors, including labor market segregation and women’s ability to reach upper end of the wage distribution and wage structure (Mandel and Semyonov, 2005; Mandel and Shalev, 2009), wage setting mechanisms (Blau and Kahn, 2003; Mandel and Semyonov, 2005), institutions including welfare state and anti-discriminatory laws (Weichselbaumer and Winter-Ebmer, 2005; Mandel and Shalev, 2009) or women’s lower labor market participation (Olivetti, Petrongolo, 2008) and labor market flexibility (Blau and Kahn, 2013; Magda and Potoczna, 2014). Parenthood wage gaps across the countries have been in turn assigned to country specific institutional context, especially with regard to family policies and cultural attitudes towards men’s and women’s division of housework and childcare (e.g. Budig et al, 2012; Boeckmann and Budig, 2013).

We combine these fields of research on the wage effects of parenthood and on gender wage inequality and analyze their relationship in a comparative perspective. We carry out the analysis for 25 European countries, based on harmonized EU-SILC data and a consistent methodology. We discuss the estimated magnitudes of the gender and parent gaps, as well as the contribution of

the parent gaps to the gender wage gap. Considering these along with the institutional framework, and family policies in particular, allows us to draw important conclusions regarding their role in the formation of the overall gender wage gap.

Our empirical strategy is based on several stages. First, we estimate wage equations for men and women, as well as parents and nonparents. We recognize that in most of the existing literature, estimates of the parenthood effect may be biased due to the multiple selection processes: 1) individual's selection into being employed, and 2) the choice of parenthood status. We address these methodological problems using a correction method (Bourguignon et al. 2007, following Dubin and McFadden, 1984), which is based on multinomial logit estimation of a selection equation that accounts for both of the processes simultaneously. In the second step, we use the estimated equations and concentrate on the gender wage gap decomposition. In order to directly assess the relative contribution of the parent gaps among men and women to the overall gender wage gap, we use a simple modification of the standard Oaxaca-Blinder decomposition (1973). Finally, we compare the results of the estimation of parent gaps for men and women, the overall gender wage gap, and the contribution of the parent gaps to the gender wage gap among the European countries available in the EU-SILC dataset. We link data on family policies of each country extracted from the OECD Family Database and the Multilinks (2011) dataset, to evaluate the role of these policies in determining the magnitude of parent gaps and, subsequently, the observed gender wage gaps.

Our findings suggest that family policies along with the labor market structure and flexibility allow for explaining some of the emerging patterns regarding the role of parenthood in shaping gender wage inequality. Based on institutional characteristics related to the labor market structure and flexibility, available family policies, and cultural views, we distinguish between three main groups of countries: 1) Southern European countries; 2) Western European countries; and 3) Central and Eastern European (CEE) countries. In the first group of countries, in which women's employment is low, the gender wage gap is small, and mostly driven by a high positive fatherhood premium. In these countries, the motherhood wage gap turns out to be positive, which, along with the low overall gender wage gap, is likely due to the selection of higher-skilled and better paid women and especially mothers into employment. Among the remaining countries, the variation in the magnitudes and contributions of the parenthood gaps may be primarily

attributed to family policies. In particular, in Western European countries (and Slovenia), the gender wage gap is found to be mostly driven by the fatherhood wage premium and gender wage gap among childless women. The motherhood wage penalty appears to play marginal role, since mothers' disadvantages compared to childless women are relatively low due to policies that encourage women to combine work and family obligations (flexible labor market employment, easier access to childcare, and moderate length paid leaves). Finally, in CEE countries where mothers are granted long paid leaves and institutional childcare is scarce, the motherhood wage gap tends to be significantly higher, and a crucial contributor to the overall gender wage inequality. These large negative motherhood wage gaps, which drive women's average wages downward, may thus be attributed to mother's long career breaks resulting from the states' explicit support of mothers being the primary caretakers of their children.

The remainder of the paper is structured as follows. In the second section, we summarize theories and previous empirical evidence related to family gaps, their role in the gender wage gap, and their relation to the institutional context. We then discuss the main relevant institutional characteristics of the countries in our sample and their implications regarding the expected parenthood effects. In section three, we present the empirical methodology that is used in the cross-country estimation of the family gaps and their contribution to the gender wage gap. Section four describes the datasets used in the empirical research, including descriptive country-level statistics. In section five, we present the main comparative country-level results along with the analysis of the impact of family policy differences on the parent and gender wage gaps. In section six we give concluding remarks.

2. Previous evidence and institutional context

2.1. Family gaps and the gender wage gap

The topic of family gaps in labor supply and wages among men and women has a large literature (among others: Browning, 1992; Korenman and Neumark, 1992; Waldfogel, 1997, 1998; Lundberg and Rose, 2000, 2002; Budig and England, 2001; Davies and Pierre, 2005). These highlight the importance of how parenthood impacts the situation of men and women in terms of both employment and wages.

In terms of the labor supply, theoretical models of collective labor supply of men and women suggest that there exists high interdependence of men's and women's labor supply, which is even stronger in case of a child's presence (Chiappori 1988, 1992; Blundell et al., 2007). This interdependence is confirmed in Becker's theory of specialization, which says that, in a household consisting of a single family with children, women tend to specialize in home production whereas men tend to specialize in production in the labor market (Lundberg and Rose, 2000, 2002; Killewald and Gough, 2013). Statistical data show that in most European countries, the employment rates of mothers are lower than those of childless women, while the employment rates of fathers are higher than those of childless men (OECD, 2004). Parenthood is thus associated with lower labor supply for women, and slightly higher labor supply for men.

In terms of wage effects, women are generally found to be penalized for motherhood in the form of lower wages, whereas fathers tend to receive a wage premium. Several theories seek to explain the existence of these changes in wages due to parenthood. In the case of women, existing research distinguishes at least five possible sources of the lower relative wages of mothers compared to childless women: 1) the loss of human capital and its depreciation during the time spent outside of the labor market due to childrearing (for example: Waldfogel, 1998; Buligescu et al., 2009); 2) compensating wage differentials – due to mothers choosing 'mother friendly' jobs and sectors; 3) unobserved heterogeneity of mothers and childless women; 4) Becker's work effort theory, stating that the lower wages of mothers result from their lower productivity, which is caused by the presence of children; and 5) discrimination based theories. Recently, more in-depth explanations have been tested, such as differences in labor market behavior, measured by the intensity of the job search of mothers and childless women (Zhang, 2012), and changes in the non-wage aspects of jobs around motherhood (Felfe, 2012). Higher wages of fathers compared to childless men are, in turn, mainly explained by: 1) men's higher specialization in labor market production (theory of specialization); 2) unobserved gains in productivity induced by fatherhood; and 3) their positive discrimination by employers, caused by a higher valuation of fathers' social status (Glauber, 2008).

Previous research reports lower wages of mothers if compared with childless women for numerous countries. The size of the estimated effects varies and ranges from small penalties in Sweden, Norway, Belgium and France (0% and 1.5%; Datta Gupta and Smith, 2002; Davies and

Pierre, 2005), moderate negative effects in Denmark, Spain and Portugal (3% to 6.5%; Simonsen and Skipper, 2006; Nielsen et al., 2004; Davies and Pierre, 2005) as well as the US (Waldfogel, 1998) to high negative effects of children on women's wages found in the UK and Germany (12 to 30%; Davies and Pierre, 2005; Gangl and Ziefle, 2009).¹ An extensive overview of empirical works on this topic has been recently provided by Nizalova et al. (2016), who investigate the motherhood wage penalty for Ukraine. Similarly, for men a positive premium from fatherhood has been found for the US (from 4 to 9%, Waldfogel, 1998, Lundberg and Rose, 2000, 2002) or Norway (from 1 to 6% depending on the number of children, Petersen et al., 2012).

However, despite the growing literature on the topic, there are only few studies that focus on the contribution of the family gap to the overall gender wage gap. This is so in spite of the fact that biological and cultural differences between the genders related to childbearing are clearly an important determinant (Hersch, 2006). For example, Dolton and Makepeace (1986) argued that individual decision regarding employment as well as the wage received from work may differ by family status. Their findings indicate that single and married women differ in terms of the determinants of employment, and childless women and those with children are also different in terms of wage equations. Based on the estimated wage equations, they decompose the gender wage gap and analyze the unexplained components of the wage gaps between different subgroups of married/single and child rearing/childless men and women. Waldfogel (1998) also argues that there exists a relation between the family gap and gender wage gap: 'The family gap may be another reason why the gender gap is larger in the United States than in other countries'. Based on OLS wage equations, she decomposes the gender wage gap in 1980 and 1991 to find that while the gender wage gap has declined, the relative contribution of the marital and parental characteristics and their returns has increased. Recently, Angelov et al. (2013) examined within couple gender wage gap in Sweden, and found that fifteen years after the birth of the first child male-female wage gap has increased by around 10 percentage points.

Cukrowska-Torzewska and Lovasz (2016) provide direct evidence on the relationship between the wage gaps that arise due to parenthood and the total gender wage gap, based on empirical methods that correct for the major selection biases present in the estimation for two countries,

¹ The results differ in the definition of the motherhood penalty, which may be considered as the effect of at least one child (motherhood in general), one child, two or three and more children.

Hungary and Poland. The main findings indicate that the fatherhood premium is the largest contributor to the gender wage gap in these two countries, and the motherhood penalty is also significant, while the gender wage gap among childless individuals is negligible. A comparison of these estimates between the two countries and compared to previous studies from other countries suggest a dependence on the particular institutional context: the motherhood penalty is higher when family policies are not supportive of maternal employment (long leave or very short paid leave, low childcare availability), and the fatherhood premium appears to be higher when cultural views are relatively more traditional. Given that, in this paper, we estimate the magnitudes and contributions for 26 EU countries, using a harmonized dataset and the same methodology (including corrections for selection biases, as discussed later). This offers us the opportunity to compare estimates from a wide variety of institutional settings, and infer their impact on the composition of the overall gender wage gap.

2.2. The role of the institutional context

There is substantial comparative empirical research on the role of institutions in shaping gender and family related labor market inequalities, which reports high cross-country variation in employment and wage gaps by gender, as well as gender-specific parenthood-based gaps (Stier et al., 2001; Weichselbaumer and Winter-Ebmer, 2005; Keck and Saraceno, 2013). The variation in the gender wage gap is mainly attributed to institutional factors, including the welfare state in general (Mandel and Shalev, 2009), women's ability to reach the upper end of the wage distribution, wage setting mechanisms, as well as characteristics of the wage distribution (Blau and Kahn, 2003; Mandel and Shalev, 2009), and women's lower labor market participation (Olivetti, Petrongolo, 2008). The role of institutional factors, including family policies and anti-discriminatory laws (Weichselbaumer and Winter-Ebmer, 2005; Mandel and Shalev, 2009) as well as cultural factors (e.g. Fortin, 2005) have also been studied. On the other hand, the cross-country variation in family gaps has been mostly analyzed based on differences in the institutional and cultural context (Keck and Saraceno, 2013; Misra et al., 2011), and especially the availability and quality of family policies (Mandel, 2012).

Contrary to previous research, the goal of this paper is to study not only how the institutional context affects the magnitudes of the gender and family wage gaps, but also how it affects the relative role of parenthood in shaping the gender wage gap. We therefore consider the most

important institutional factors affecting family gaps, as highlighted in previous studies: key family policies, labor market flexibility, and cultural attitudes.

Family policies that are most often considered in this line of empirical research are the length of paid maternity leave and parental leave, and childcare coverage. The length of the child-related leave available to mothers affects how long mothers are absent from the labor market.² Previous evidence suggests that long leaves decrease women's employment continuity, leading to longer career interruptions, and consequently, the lower average wage of mothers (Buligescu et al., 2009). At the same time, short maternity leaves (or no leave) may cause some women to decide to stay at home with their child longer and leave the labor market indefinitely, which also leads to a higher family gap. Moderately long leaves, in turn, are likely to reduce family gaps, as they allow mothers to balance their attachments to both the labor market and their family (Budig et al., 2012).

The length of the maternity leave may also impact family gaps indirectly, through their influence on decisions regarding parenthood and employment. Keck and Saraceno (2013) suggest that short maternity leaves may have a negative impact on the parenthood choices by discouraging women who earn high wages from having children, leading to a greater family gap in wages. Waldfogel et al. (1999) also show that short leaves incent lower educated women who earn low wages to drop out of the labor market following childbirth. In the case of long but unpaid leaves, the opposite applies, since low paid women may not be able to afford to stay home (Lapuerta et al., 2011).

The accessibility of public childcare is also an important factor. Easily accessible childcare is found to positively affect labor market participation and the work continuity of women (Pettit and Hook, 2005), leading to a lower motherhood penalty. Childcare availability may, however, also indirectly affect the family gap, as it is an important factor in determining whether a woman returns to work. In particular, when public childcare is limited and private care is costly, low paid

² We focus on total child-related leave available to mothers, which includes maternity leave as well as parental leave not reserved for fathers. Parental leave is usually available to both parents, so parental leave regulations may have an effect on the labor market outcomes of not only women, but also men. OECD statistics for 2013 show however that except for Scandinavian countries (Sweden, Norway, Denmark and Finland) as well as Portugal, Luxembourg, Belgium and Germany the percentage of men who use parental leave is rather low and it is predominantly used by women in most countries.

women may be more likely to drop out of the labor market, as they may substitute their low paying work for costly childcare, leading to smaller family gap in wages.

Labor market flexibility is also considered an important factor, since mothers, especially those with young children, may find it more difficult to return to full time positions. On one hand, flexible labor market allows women to combine work with family responsibilities, increasing their labor supply, but on the other hand, it may be costly and lead to lower wages (Hirsch, 2005). Several studies find a negative part-time wage penalty among women (e.g. Gregory and Conolly, 2008; Manning and Petrongolo, 2008; Bardasi and Gornick, 2008). Since mothers more than childless women are likely to work part-time, part-time employment and other work adjustments have been found to explain part of the wage penalty incurred by mothers (e.g. Waldfogel, 1997; Joshi et al., 1999; Budig and England, 2001).

Cultural norms have also been found to impact motherhood related inequalities in wages. For example, Davies and Pierre (2005) report the size of the wage penalty incurred by mothers for a number of European countries, suggesting that family policies and cultural attitudes are likely to explain revealed country variation. Budig et al. (2012) not only report the estimates of family gap in the wages for women but also test these explanations.³ Their research reveals that there is an interaction effect of policies and culture, so that the effect of policies depends on the perception of women's employment and their caring role in the family. Boeckmann and Budig (2013) analyze cross country wage inequalities due to fatherhood and link the findings to cultural indicators aiming at capturing attitudes towards men's and women's employment and caring responsibilities. In countries where men are still regarded the primary breadwinners, those men who have children are more likely to work harder and longer hours once they become parents in order to ensure their family's financial stability. In such traditional countries, the wage premium from fatherhood may be very high.⁴

Table 1 summarizes some main institutional characteristics for the countries in our analysis. In particular, we report institutional variables that refer to the labor market and its flexibility,

³ Their analysis is however based on OLS estimation results that – as shown by Davies and Pierre (2005) – carry significant bias due to unobserved heterogeneity of mothers and childless women.

⁴ While the length of leave reserved specifically for fathers is generally low in most countries - with the exception of some Western European countries - it may also be seen as reflecting existing cultural expectations regarding gender roles and the government's commitment to achieving greater gender equality.

indicators aiming at capturing gender norms, and selected family policies measures. Based on this table, three main groups of countries may be distinguished. First, there is a group of Southern European countries (group A) that is characterized by relatively low female employment and strong traditional gender norms. This group includes: Italy, Greece, Spain and Portugal. The family policies of these countries vary, but are mostly characterized by relatively shorter leaves (especially Spain), and, in some cases, childcare coverage rates below those seen in Western European countries for ages 0-3 (Italy, Greece) and for ages 3-6 (Greece, Portugal). The availability of part-time work in group A countries is also generally lower than seen in Western European countries.

The second group of countries consists mostly of Western European countries (group B). This groups is characterized by more gender equal cultural views, higher female employment, relatively high labor market flexibility (with the exception of Slovenia and Finland), as well as high childcare accessibility and the availability of paid leaves of moderate length. Based on Leitner (2003), such a combination of family policies may be referred to as optional familialism, since the state gives women an option to choose to either provide childcare within the family using available leaves, or to transfer care outside of the family to institutions. The only exception within the group in this respect is the UK, where no paid parental leave is available; the length of maternity leave for mothers is however relatively long here, meaning that it may partially take over the role of parental leave policy.

The last group of countries consists of Central and Eastern European (CEE) countries (group C). It also includes Austria and Germany. The distinct feature of this groups is that there is a limited childcare assistance for small children aged 0-3 (in the form of formal care in the public and private institutions) and relatively long parental and maternity leaves for mothers. This coexistence of long leaves' scheme and low availability of institutional childcare may be characterized as explicitly supporting family in its caring role (Leitner, 2003). The only CEE country that does not follow this scheme is Poland, which for the analyzed period did not provide any paid parental leave.⁵ In this group we also observe strong traditional views regarding the gender division of labor and the provision of childcare within the family, which may reinforce institutions' role.

⁵ This has been changed in 2013 and since then there is 26 weeks of paid parental leave.

Based on the reviewed research and institutional characteristics of the analyzed countries we expect the family gaps among women to be greater (i.e. more negative) in countries where existing family policies explicitly support women acting as the main providers of childcare, and cultural norms reinforce this expectations. In particular, we expect to find relatively high negative family gaps among women in the CEE countries, as well as Germany and Austria. In the case of countries that provide women more options in the form of paid leaves associated with the birth of a child as well as institutional childcare, we expect the family wage gap to be relatively smaller. On the other hand, it can be also expected that the wage advantage of fathers relative to childless men will be greater in countries where traditional cultural and gender norms are sustained. Thus, we expect to find higher positive family gaps among men in the groups of Southern and Central and Eastern European countries. Given these expectations regarding the size of the family wage gaps, we also hypothesize that CEE countries face greater gender wage inequality, which arise due to women being penalized for motherhood and men receiving a wage premium associated with having children. On the other hand, the expectation of small family wage gaps in Western European countries makes us anticipate to find there smaller gender wage inequality.

Table 1. Institutional variables by country

Indicator	GDP	Employment to population ratio		Part-time employment		Overall men are less competent than women to perform household tasks	A father must put his career ahead of looking after his young child	Length of total leave				Childcare coverage		Familialization of policies
	Per capita (\$)	Female (%)	Male (%)	Female (%)	Male (%)			Total (weeks)	Maternity leave (weeks)	Parental leave (weeks)	Paternity leave (weeks)	Aged 0-3	Aged 3-6	Type
Source	World Bank	Eurostat				Eurobarometer		OECD + Multilinks				Eurostat		Leitner (2003)
Italy	31455	46	69	28	5	71%	43%	47.67	21.67	26	0	25	91	optional
Greece	22258	47	71	10	3	55%	30%	33.25	17	16.25	0	12	68	explicit/implicit
Spain	26584	53	69	23	5	58%	35%	16	16	0	2	37	92	defamilialization
Portugal	19009	61	71	16	8	57%	24%	25.79	11.79	14.00	13	33	73	optional
Sweden	44746	71	75	40	13	30%	6%	67	15.57	51.43	10	51	93	optional
Denmark	48859	72	79	36	14	22%	14%	64	18	46	2	73	94	optional
UK	40196	65	76	43	11	37%	25%	52	52	0	2	33	87	defamilialization
Slovenia	19426	62	70	12	8	47%	25%	49	15	34	18	32	86	optional
Norway	67198	74	78	43	14	N/A	N/A	46.75	9	37.75	8	39	83	optional
France	35468	60	69	30	6	31%	14%	42	16	26	2	37	95	optional
Luxembourg	81889	56	73	37	4	36%	18%	42	16	26	26	33	70	optional
Finland	40350	68	71	19	9	37%	23%	41.80	17.5	24.3	8	27	77	optional
Netherlands	43513	69	81	76	24	20%	16%	29	16	13	13	47	89	optional
Belgium	37777	56	68	42	8	36%	26%	28.54	15	13.54	16	41	99	optional
Iceland	58291	79	84	34	10	N/A	N/A	26	13	13	13	40	97	optional
Czech Rep.	14528	57	74	9	2	51%	35%	214	28	186	0	3	70	explicit
Slovak Rep.	13953	53	67	5	2	51%	48%	164	29.50	134.5	0	3	71	explicit
Estonia	11201	64	69	13	5	38%	21%	150	20	130	2	18	88	explicit
Austria	40178	64	76	42	8	58%	41%	138	16	122	16	9	76	explicit
Germany	36963	64	75	45	8	52%	26%	109.15	14	95.15	4	20	89	explicit
Bulgaria	4521	57	64	3	2	66%	38%	107.57	33.86	73.71	2	9	65	explicit
Hungary	11337	51	62	7	4	71%	48%	108	24	84	1	8	76	explicit
Lithuania	9196	61	63	10	7	52%	26%	106	18	88	6	11	63	explicit
Romania	5738	52	66	11	9	63%	37%	106	18	88	1	7	57	explicit
Poland	9499	51	64	12	6	57%	40%	19.50	19.5	0	1	3	36	implicit

Notes: Familialization type assigned consistently with Leitner (2003) based on the availability of paid parental leave and childcare coverage rate for children aged 0-3.

3. Empirical methodology

3.1. Modeling the wage equations

From the methodological point of view the analysis of the gender wage inequality and the family gap is not trivial, since not all the individuals decide to have children and work and these decisions may be related to unobservable factors that influence wages as well. Most often the previous literature on family gaps deals with only one of these selection concerns. As a result the obtained estimates corrected for employment selection are still likely to be biased if individuals self-select into parenthood, and the estimates that correct for parenthood selection are biased due to non-randomness of the working sample population. We treat these two selection processes jointly and apply the multinomial correction model proposed by Dubin and McFadden (1984). This model has desirable properties and it is preferred to other selection models that involve several alternatives, such as Lee's (1983) or Dahl's models (2002), (see Bourguignon et al., 2007).⁶

Similarly to other selection models, Dubin's and McFadden's model (hereafter DMF) relies on two stage estimation procedure. In the first stage, individuals choose their particular employment-parenthood status out of four possible alternatives ($s = \{1,2,3,4\}$), i.e. being: (1) a working parent, (2) a working non-parent, (3) a non-working parent and (4) a non-working non-parent. This choice is modeled by a multinomial logit model. In our framework, the analysis is performed separately for men and women. Then, the wage equation conditional on choosing $s=1$, is given by:

$$\ln w_j^1 = x_{1,j} \beta_{1,j} + \sigma \frac{\sqrt{6}}{\pi} \sum_{s=2}^S r_{s,j} \left[\frac{P_{s,j} \ln(P_{s,j})}{1-P_{s,j}} + \ln(P_{1,j}) \right] + v_{1,j}. \quad (1)$$

Where subscript $j = \{f, m\}$ refers to females (f) and males (m), $P_{s,j}$ is the predicted probability that alternative s is preferred and $r_{s,j}$ denotes correlation coefficient between the error terms from the multinomial logit and wage equations. In practice, wage equations for each specific employment-parenthood combination additionally include three correction terms referring to the remaining alternative choices. The estimated coefficients reflect the correlation between unobservable factors that influence wages in the selected employment-parenthood combination, and unobservable factors that influence the choice of a remaining alternative. For example, a negative

⁶ For details regarding the application of Dubin's and McFadden's multiple selection model to the analysis of wages by parenthood status see Cukrowska-Torzewska and Lovasz (2016).

coefficient related to alternative s in wage equation $s+I$ shows that there are unobservable factors that increase the attractiveness of choosing alternative s , and decrease wages in alternative $s+I$.

We control for several variables in the wage equations, namely education, age of individuals and marital status.⁷ We do not account for occupation or sector of work, since these may be endogenous in the wage equation and correlated with the decision on parenthood. We also control for regional disparities and include the size of the place of residence in terms of the total number of inhabitants and the region. The identification of the model requires valid exclusion restrictions, that is variables, which are included in the estimation of the first stage multinomial logit model but are excluded from the wage regression. Given the data, we use a set of exclusion restrictions that have been previously adapted in similar research (Joshi et al., 1999, Cukrowska-Torzewska and Lovasz, 2016): an indicator whether an individual has a spouse who is employed, the age of the spouse, the total number of individuals living in the household, and variables on housing conditions (the total number of rooms).⁸ Having a spouse that is employed is expected to decrease the employment propensity for women and increase it for men. Similarly, we expect that living in a bigger household may cause women to decide to stay at home to take care of the household members, whereas for men it might be an incentive for providing financial security of the family. We expect that living with parents and having a spouse that is employed increases the probability of parenthood. Empirical research has proved that childcare by a grandparent is common, especially when formal childcare is limited (Jappens and Van Bavel, 2012), so living with a parent may assure “free” child care, and serve as a positive incentive for entering the parenthood. Finally, we anticipate that better housing conditions, measures by the number of rooms, will also cause individuals to be more willing to have a child.

⁷ The datasets we use do not provide a measure of actual labor market experience. We include both age and education, but not the potential experience variable that could be calculated from these. As shown by Anderson et al. (2003) potential experience overestimates women’s actual experience if women who have children take time off to raise children. This means that our estimates of the effect of parenthood include the effect it has through influencing the amount of time spent in the labor market, which is a potentially important channel, as outlined in the literature review.

⁸ The choice of exclusion restrictions is largely limited by data availability. Other variables that could be used but are either entire unavailable or missing for certain countries include for example: non-labor income of the household, housing tenure, variables indicating family values and attitudes at the age of 16 (e.g. Korenman and Neumark, 1992, Joshi et al., 1999).

3.2. Decomposing the gender wage gap that accounts for the parenthood

To assess the role of family wage gaps in the formation of the overall gender wage inequality, we adapt an extension of the standard gender wage gap decomposition commonly referred to as the Oaxaca-Blinder mean decomposition (1973), (see Cukrowska-Torzewska and Lovasz, 2016). Using this method we portion the difference in men's and women's averages wages into three main components: 1) the family gap among women; 2) the family gap among men, and 3) the gender wage gap among childless individuals. Denoting the separate wage equation for parents and non-parents as:

$$\ln w_j^c = X_j^c \beta_j^c + u_j^c \quad (2)$$

Where $c = \{CH, NCH\}$ refers to two observed states of employment and parenthood status (CH - being working parent and NCH - being working non-parent), and $j = \{f, m\}$ refer to females and males, the gender wage gap may be decomposed as follows:

$$\overline{\ln(w_m)} - \overline{\ln(w_f)} = p_m(\overline{\ln w_m^{CH}} - \overline{\ln w_m^{NCH}}) - p_f(\overline{\ln w_f^{CH}} - \overline{\ln w_f^{NCH}}) + (\overline{\ln w_m^{NCH}} - \overline{\ln w_f^{NCH}}) \quad (3)$$

Note that when women are penalized for motherhood (the family wage gap among mothers is negative) then this contributes positively towards the formation of the overall gender wage gap. Similarly, when men receive premium associated with fatherhood, the premium drives men's average wages up, contributing towards larger gender wage inequality.

Using standard Oaxaca-Blinder decomposition method each of the three components may be additionally decomposed into explained (endowment) and unexplained (remuneration) components. Since the wage equations are corrected for selections, among the explanatory variables we additionally have correction terms, which may be either treated as a separate component of the decomposition or subtracted from both sides of the estimated equation (Neuman and Oaxaca, 2004). In our analysis, we interpret the selection terms as an additional selection component representing the part of the gap that is due to the difference in selection patterns.

4. Data and descriptive statistics

For our empirical analysis we use the data coming from EU-SILC cross-sectional dataset, which is a large data collection distributed by Eurostat for selected European countries. We use the data

that are available for the years 2004-2013. Exact time span, however, varies by country, and only for 15 countries data are available since 2004 till 2013.⁹ Since 2005, the dataset additionally covers Germany, the Netherlands, the UK and nine of the then ten new EU Member States (all except for Estonia). Since 2006 data collection is also carried out in Bulgaria and Turkey and since 2007 in Romania and Switzerland.

The primary goal of this survey is to collect nationally representative, harmonized data regarding detailed information on individual and household level incomes (wage and non-labor income) and spending (exact amounts spent on various goods). Moreover, the database contains the main demographic characteristics of the respondents (gender, age, education), labor market status details (activity, details of current and previous employment), their family situation (i.e. marital status, number of children, the age of the children, total household size, etc.), and home environment (characteristics of the home, durable goods, and location). Spouses and children – and therefore their characteristics - are linked to each other based on individual and household identification codes.

In the analysis, we consider only employed individuals who are not in self-employment, are not studying and are of working age. Due to the differences in the retirement age among the countries, we restrict the age from above to the lowest retirement age for women, which is 59 years. As we are interested in deriving the relative contribution of the parent gaps to the gender wage gap, we further restrict the sample to individuals who are at least 25 years old, when the sample is likely to include parents and non-parents. Furthermore, we also exclude individuals who are employed in agriculture, since their earnings are subject to high fluctuations.

We carry out the analysis for 25 countries: Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Italy, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden and the UK. We drop from the analysis Ireland, Turkey and Switzerland, as well as Cyprus, Malta for which the sample sizes are relatively low. We also do not consider Latvia due to the high share of missing wage information.

⁹ These countries include: Austria, Belgium, Denmark, Estonia, Spain, Finland, France, Greece, Ireland, Iceland, Italy, Luxembourg, Norway, Portugal and Sweden.

The principal focus of our analysis is a variable that indicates the presence of a child. Since the aim of this research is to reveal what portion of the gender wage gap may be assigned to gender specific wage gap that arises due to parenthood, we concentrate on whether an individual has a child or not, and we do not account for the exact number of children. To do so, we first derive the variable indicating whether an individual is a child based on age, and then calculate the total number of children a mother or father has based on the indicators assigning the relations within the family, as well as the variables indicating the id of a mother and a father. We define a child as an individual that is living in the household with his parents and who is below 25 years old. By doing so, we restrict the term *child* only to a family member that is likely to be dependent on his parents.

Appendix Table A.1 summarizes the number of observations of individuals for each country in our sample. Additionally, the table gives the share of employed by gender, and the share of parents. The respective shares in the intersections of these categories used in the multinomial logit specification are shown in Appendix Table A.2. These show that sample sizes differ across the analyzed countries; the smallest sample size is reported for Romania (18,724), whereas the greatest for Italy (146,542). The share of sample that is working for a wage varies among the analyzed countries and ranges from around 45-50 to 70-80. Except for Romania the shares of parents, both among men and women, oscillate around 50-60%. The investigation of the intersection of this categories by gender reveals that women, both mothers and childless, are more likely than men – fathers and childless – not to work. While men rather concentrate in two categories – working fathers and working childless men – women tend to aggregate into all four categories.

The dependent variable in our analysis is the natural logarithm of hourly wage. There are two measures of earnings available in the dataset: 1) earnings received during an income reference period, which for most of the countries is a calendar year proceeding the interview, and 2) monthly earnings at the time of the interview.¹⁰ Unfortunately, not for all analyzed countries both measures of earnings are available, and for some countries only the first variable is reported. On the other hand, data on working time (hours of work), which would allow us to derive an hourly wage rate, refer to the usual hours worked per week at the time of the interview. Given the data

¹⁰ For some countries income reference period is defined as 12 months preceding the interview.

structure, we decide to concentrate only on the full time employees, as for them it is possible to derive hourly wage based on the re-calculated monthly earnings and the reported working time. We thus calculate the measures of hourly wages for full-time workers based on the information on yearly salary divided by 12 months and usual working hours. Summary statistics of wages in the countries in our sample by gender and parental status are given in Appendix Table A.3. Wages are expressed in real terms in local currency. The table gives average wages by gender and parental status, as well as the average number of hours worked by each group. These show that in most countries men that have children receive slightly greater wages than childless men, but also work slightly longer working hours. For women, the opposite pattern is observed: in most countries women who have children receive lower wages, but work slightly shorter time than women with no children.

Detailed summary statistics of the control variables in the wage equations are presented in Appendix Table A.4., by gender and country. We include marital status, age, the level of education of individuals, which is defined in accordance with the ISCED classification, geographical variables capturing the density of the population of the place of living and the region of the country, as well as year fixed effects.¹¹

To evaluate the impact of institutional context, and different family policies in particular, on the parent gap and its role in the gender wage gap, we link country-level information to the EU-SILC data. We use institutional data coming from several sources as presented in Table 1.

5. Results

We now turn our attention to the discussion of the estimation results. First, we analyze the magnitudes of the various wage gap estimates by country, and based on the country groups outlined in the background section. Next, we discuss the contributions of the family gaps among women and men and the gender gap among childless individuals to the overall gender wage gap, paying special attention to their relationship with the institutional context. The full set of estimated wage gap magnitudes and contributions can be seen in Appendix Table A.6.

¹¹ ISCED (International Standard Classifications of Education) distinguishes between different levels of education and assigns detailed description to each level. The lowest level is ISCED 1, which is primary education that usually starts at age of 6 and lasts between 4 to 6 years. ISCED 2 stands for lower secondary education that follows primary education and usually lasts between four to six years. ISCED 3 follows ISCED 2 and lasts between two to five years – students usually leave this level of education at age 17 to 20. Finally ISCED 4 refers to post-secondary but not tertiary education and ISCED 5 and higher for different levels of tertiary education.

5.1. Magnitudes of the family and gender wage gaps estimates

Figure 1.a. presents our estimates of the overall gender wage gap. Countries are grouped according to those defined in section 2, and in decreasing order by gender wage gap magnitude within the groups. Group A consists of Southern European countries, which have the most consistently low raw gender wage gap estimates under 0.1. The unexplained components of these gaps are also low, as can be seen in Appendix Figure A.1. Group B, which includes mostly Western European countries, and group C, composed of CEE countries, show significant variability in gender gap estimates. Group B countries' values range from around 0.08 (Belgium) to 0.27 (Sweden), while group C values range from a very low 0.04 (Poland) to around 0.34 (Estonia). Figure 1.b. further includes female employment ratios, and is suggestive of a positive correlation (of around 0.56). This is especially true for the Southern European countries, which, compared to Western Europe, register much lower employment rates for women. In these countries, women's low employment coexists with low gender wage gaps, as employed women are relatively highly skilled and highly paid. In CEE, countries with the lowest gender wage gaps also display relatively lower employment rates.

As a robustness check, we compare the gender wage gap estimates obtained for our sample with the existing cross-national statistics distributed by Eurostat (Appendix Table A.5.). The comparison of these measures reveals that our estimates are robust and close in magnitude to the national estimates. The reported inconsistencies might be attributed to our sample restriction in terms of age and sector of employment, as well as the time span analyzed.

Figure 2.a. depicts the estimates of the family gap among women, also by group and by decreasing magnitude within groups. Specific components of the gaps are presented in the Appendix Figure A.2. For group A, i.e. Southern EU countries, we obtain mostly positive estimates (with the exception of Portugal), which reveals that working mothers receive a positive wage premium when compared to working non-mothers. This observation could suggest that in these countries, mothers who work are likely to be especially career-oriented, highly skilled, and thus well paid.

Figure 1.a.: Gender wage gap estimates

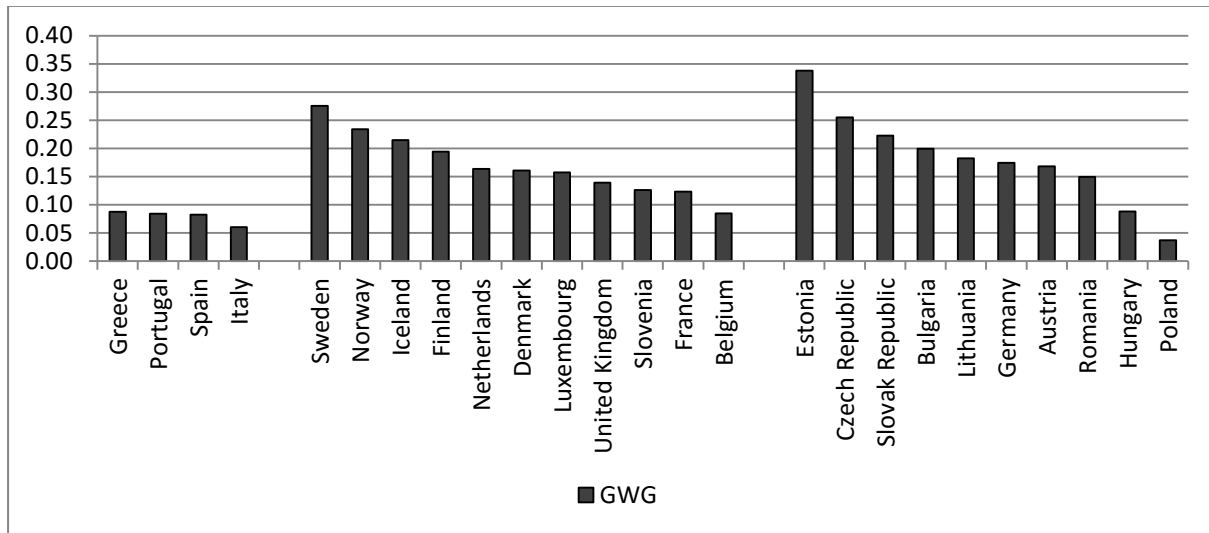
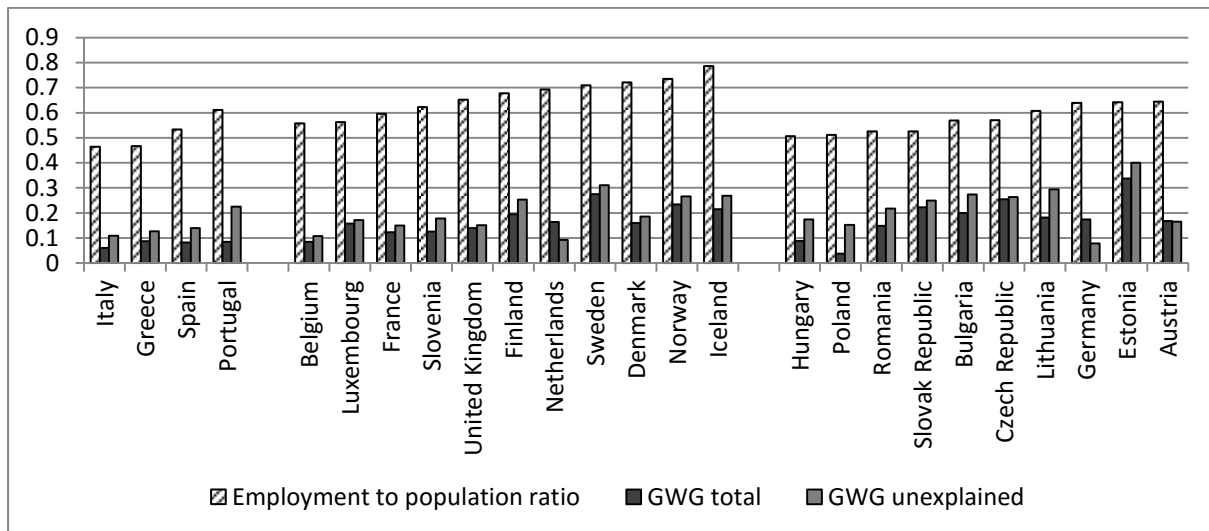


Figure 1.b.: Gender wage gap estimates and the employment ratio of females



Source: Own estimates based on EU-SILC data and Eurostat data.

Detailed decomposition results presented in Appendix Figure A.2. confirm that large parts of these positive wage gaps stem from women’s selective allocation to employment and motherhood, as well as other observable differences between working mothers and childless women. The remaining wage gap among mothers and childless women is, however, still positive (except for Greece, where a negative unexplained part is reported). The estimates obtained for Group B, i.e. Western countries, show high variation in female family gap estimates, ranging

from a motherhood premium of 0.09 (Iceland) to a negative penalty of 0.19 (Luxembourg). Finally, the estimates for Group C, the CEE countries, all show a negative motherhood penalty, ranging from 0.02 (Estonia) to 0.16 (Romania). For these countries, the negative motherhood wage penalty is present even after controlling for differences in observable characteristics and selection patterns (see Appendix Figure A.2).

As depicted in Figure 2.b, group C of countries, for which the greatest motherhood wage gaps are reported, provide mothers with a scheme of family policies that is different than those seen in the other countries. In particular, as opposed to groups A and B, for group C, we observe long paid leaves which coexist with low accessibility of childcare institutions. In addition, as indicated in Table 1, there is also strong support for traditional gender roles. Thus, family policies and traditional gender views in these countries may lead to mothers' long absences from work (with an increase in employment at later child ages), and thus to their lower wages due to the lost human capital during the employment breaks. In consequence, in group C countries, mothers face unfavorable institutional conditions that do not allow them to reconcile work and family obligations, and thus lead to their labor market disadvantage over childless women, realized in the form of a wage gap.

Figure 2.a.: Family gap among women

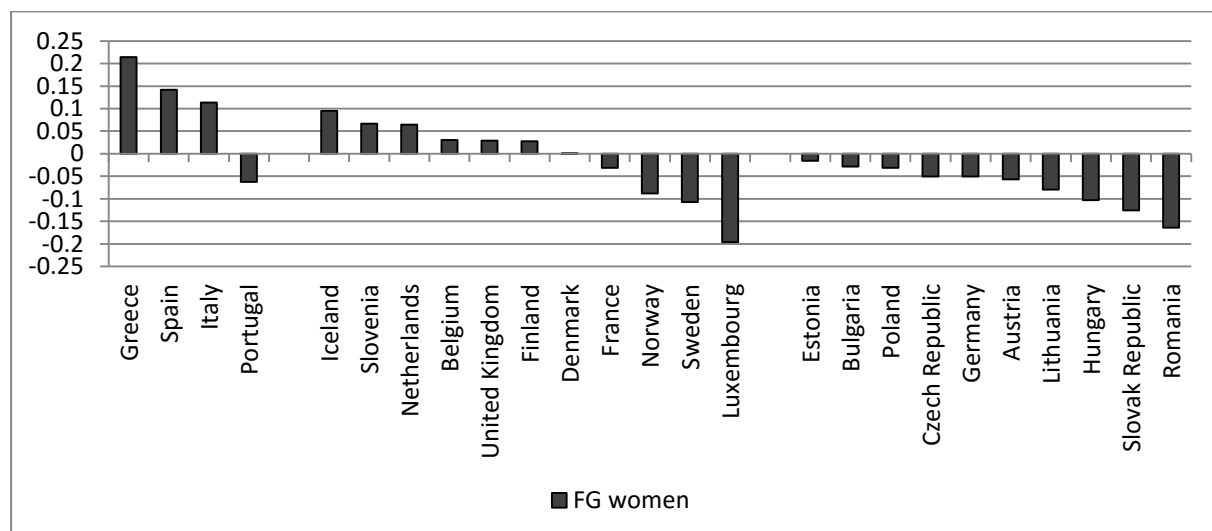
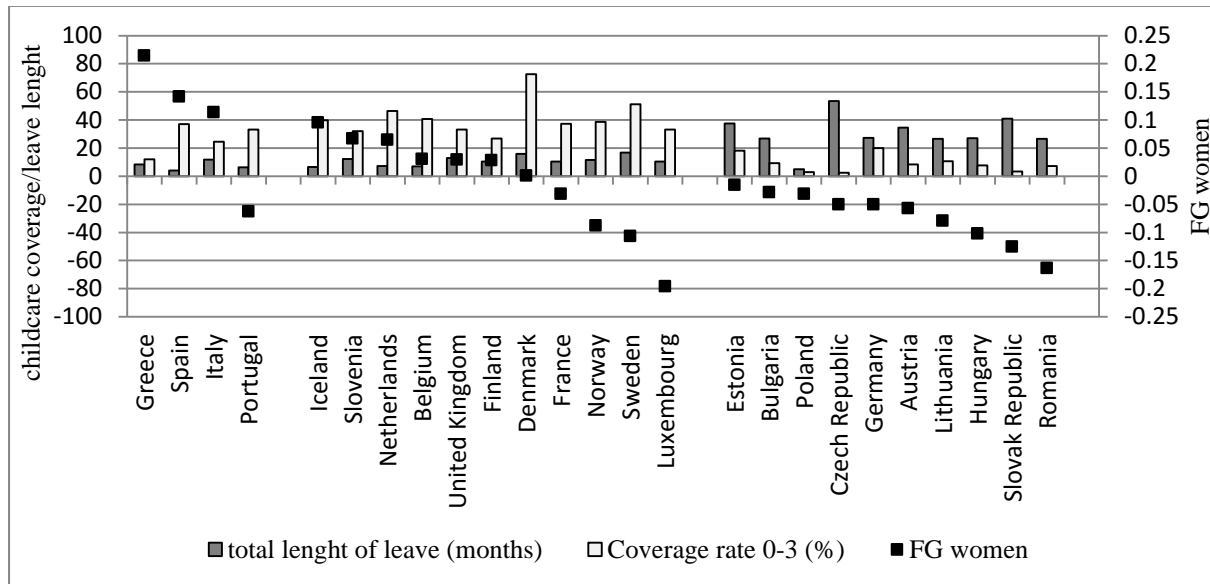


Figure 2.b.: Family gap among women and selected family policies



Source: Own estimates based on EU-SILC data and Eurostat (coverage rate), OECD and Multilinks (leave length) data.

Figure 3.a. depicts the family gap estimates for men. Fathers in almost all countries receive a premium compared to non-fathers. Detailed decomposition results presented in Appendix (Appendix Figure A.3.) reveal that part of these positive fatherhood wage premiums is associated with men’s selection into employment and fatherhood status. Once these processes, as well as other observable differences between fathers and childless men are accounted for, we still find a positive, though slightly lower, fatherhood wage premium in most of the countries. Differences among the groups of countries with respect to cultural attitudes towards men’s role in the childcare do not seem to provide an explanation for the emerging patterns. For both Western European countries, which appear to display more egalitarian views regarding men’s role in the household and childcare, and for CEE and Southern countries, which share more traditional views, we find comparable fatherhood wage premiums (Figure 3.b.).

Figure 3.a.: Family gap among men

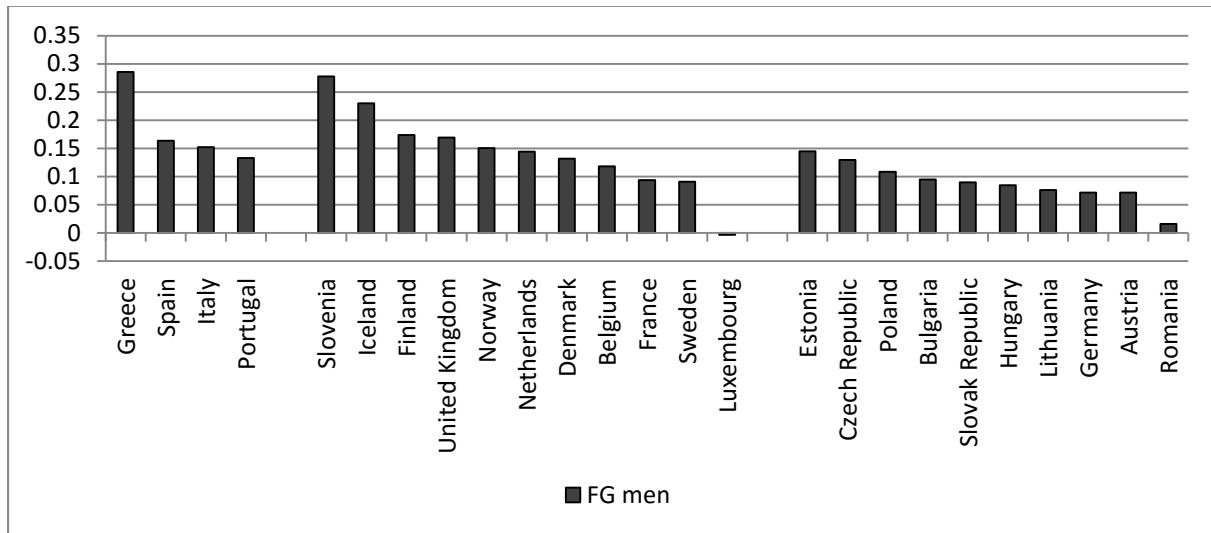
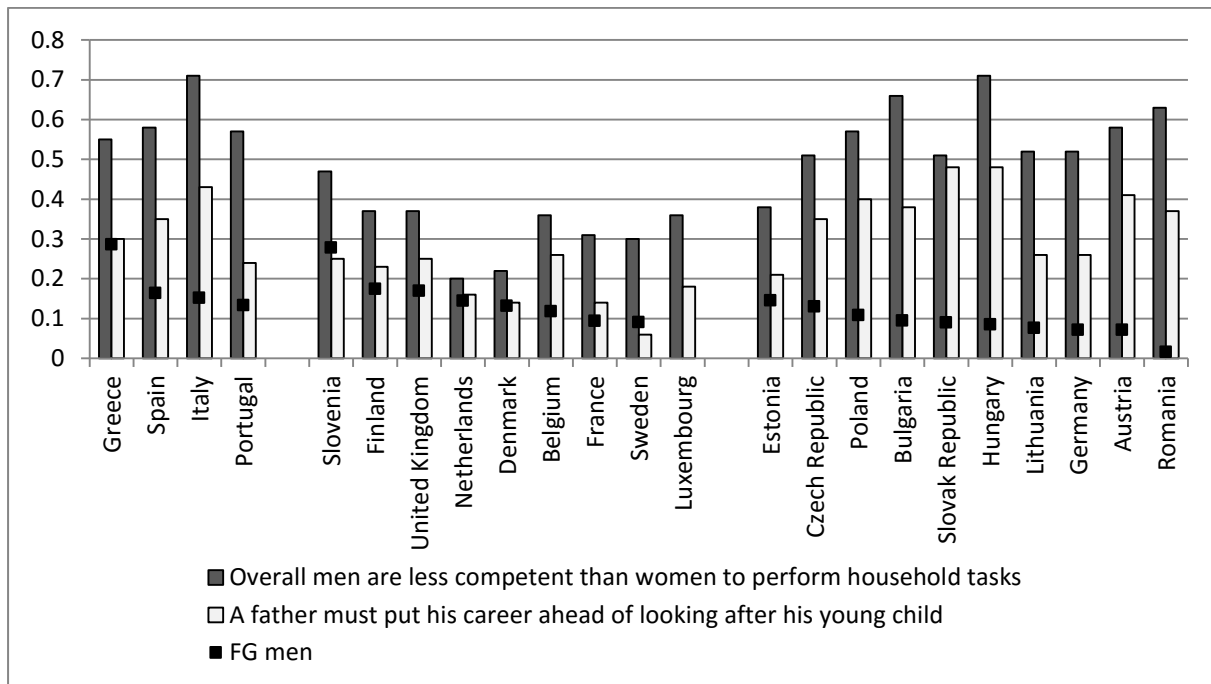


Figure 3.b.: Family gap among men and culture indicators

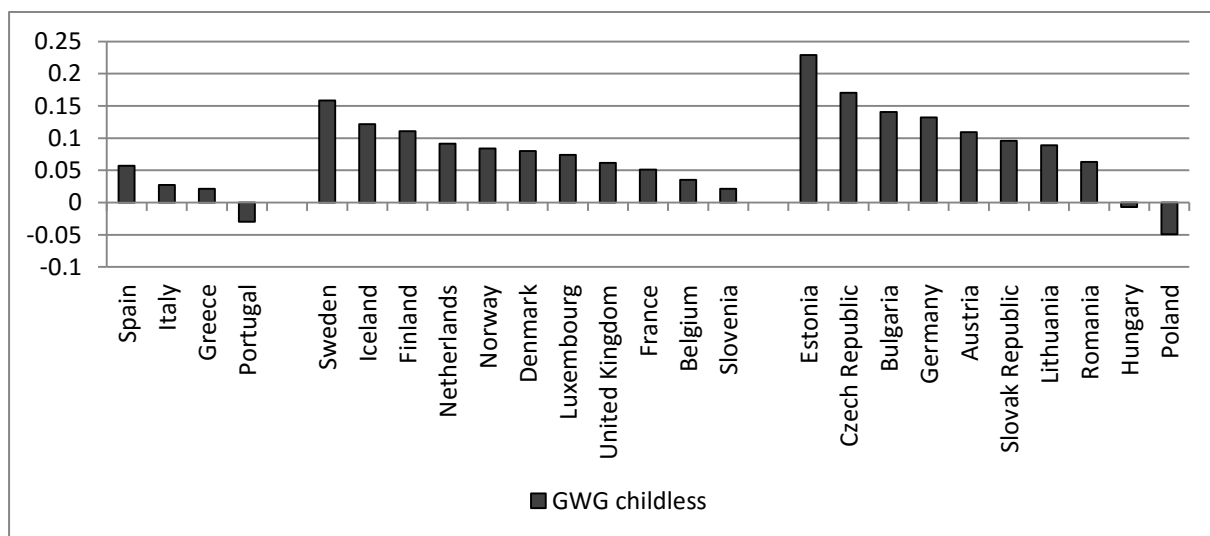


Source: Own estimates based on EU-SILC data and Eurobarometer data.

Finally, Figure 4 depicts the remaining component of the gender wage gap – the gender wage gap among individuals who do not have children. This component is mostly positive, meaning that childless men receive greater wages than childless women. Detailed decomposition results are

presented in Figure A.4. in the Appendix. These results show that revealed gaps cannot be attributed to selection behavior and decisions regarding employment and parenthood, nor to differences in observable characteristics by gender. Instead, for the majority of the countries (with the exception of Sweden and Slovenia), the unexplained part of the gap is greater than the gap itself, meaning that among comparable childless men and women, women would get even lower pay for their work. Interestingly, consistently with the estimates of the total gender wage gap, the lowest gap among childless individuals is observed in the Southern countries.

Figure 4: Gender wage gap among childless



5.2. The contributions of the family gaps and the gender gap among childless individuals to the overall gender wage gap: comparative perspective

The main focus of our analysis, the relative contribution of these components to the overall gender gap is depicted in Figure 5. For countries assigned to Group A, i.e. Southern European countries, the largest contributor to the total gender wage gap is the positive fatherhood premium. The estimated motherhood wage gap is positive, meaning that mothers receive greater pay than childless women. As a result, women’s averages wages are not lower due to motherhood. Instead, motherhood is a factor that is associated with women’s greater wages, and thus it contributes towards decreasing of the overall gender wage inequality. In other words, if mothers did not experience a wage increase, total gender wage inequality would be greater. It might be argued that low gender wage gaps reported for Southern European countries results from women’s

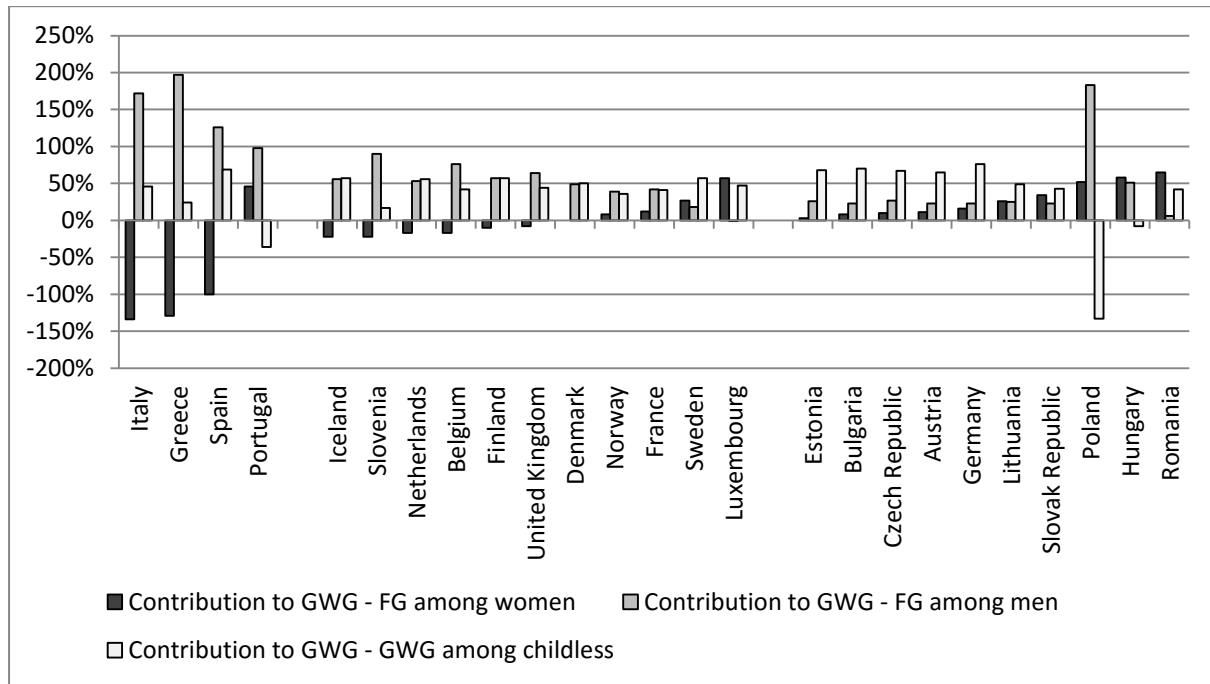
overall low employment rates (as in Figure 1.b.), with the consequence that only the most motivated and highly skilled women work. Detailed decomposition of the family gap among women partially confirm that part of the positive wage premium for mothers stems from women's selection to motherhood and employment (compare Appendix Figure A.2.). This particularly reflects that women who are more likely to receive higher wage decide to combine work and childrearing. Accounting for selections leads to lower motherhood wage premium estimates, and consequently, women's greater disadvantage compared to men, and a greater wage inequality.

For the countries clustered into the Group B, the size of the motherhood penalty varies significantly, but its relative role in driving the total wage gap remains rather small (with the exception of Luxembourg). Instead, the gender wage gap is mostly driven by fatherhood wage premium and gender wage gap among childless women. This group of countries is characterized by providing women institutional incentives to combine work and family obligations – mostly via flexible labor market employment, relatively easy access to childcare, and moderate length paid leaves. As a result, mothers are not found to be in a disadvantaged position, and do not fall behind childless women in their wages. The overall gender wage inequality is mostly a consequence of men's greater wages associated with fatherhood (which remain mostly unexplained by observable factors) as well as the gender wage gap among childless individuals.

In the last group of countries, group C, we observe somewhat different patterns. For all countries, both the wage penalty associated with motherhood, and the wage premium associated with fatherhood contribute towards the formation of the overall gender wage gap. Motherhood thus lowers mothers' average wages, whereas fatherhood increases the averages wages of men. In consequence, in these countries, parenthood is an important factor contributing towards the divergence of men's and women's wages. The motherhood wage penalty has a greater role here than elsewhere, which may be related to family policies that explicitly support mothers in their caring function for children. These family policies include long leaves, leading to long employment breaks, as well as very low accessibility to institutional childcare, especially at young ages of the child. The fatherhood premium turns out to be the most significant contributor of the gender wage gap in the case of Poland. Specific results for this country, however, show that this positive premium for men is mostly a consequence of non-random allocation of men to

parenthood and employment, as well as other observable differences between men with and without children.

Figure 5: The contributions of the family gaps among women and men, and the gender gap among childless to the overall gender wage gap



Source: Own estimates based on EU-SILC data.

6. Conclusion

In this study, we estimate the magnitudes of family gaps among men and women, as well as the gender gap among childless individuals, and assess their contribution to the overall gender wage gap for 25 EU countries. We use harmonized EU-SILC data and a methodology that corrects for potential selection biases due to employment and parenthood decisions, and allows us to decompose the overall gender gap into these components. We analyze the resulting wage gap estimates and decomposition in light of relevant institutional characteristics of the countries that have been highlighted in previous cross-country analyses of the gender wage gap and the family gaps among men and women. Our study is the first to provide family gap estimates from so many countries using the same methodology, and to assess cross-country variation in the relative roles of family gaps in shaping the overall gender wage gap.

The countries in our analysis are categorized into three groups based on their labor market characteristics, family policies, and cultural norms. Family policies are evaluated based on how well they support maternal labor market activity and the reconciliation of work and family duties, as seen in Leitner (2003). We find that in Southern European countries, low female employment rates go hand-in-hand with a low gender wage gap and a positive motherhood wage gap, suggesting that selection into employment plays an important role for both women in general and mothers in particular. The main contributor to the gender gap seems to be the fatherhood premium. In Western European countries (and Slovenia), the magnitude of the motherhood wage gap varies, but it is not a significant contributor to the overall gender wage gap. This is likely due to family policies, cultural norms, and labor market characteristics that allow mothers to better reconcile work and family obligations. The gender gap in these countries is rather due to the fatherhood premium, and the gender wage gap among childless individuals. In the CEE countries, as well as in Austria and Germany, the motherhood penalty is significant, and the most important contributor to the overall gender gap, alongside the fatherhood premium. Family policies, labor market inflexibility, and traditional cultural norms in these countries lead to the long absences of mothers from work, and a wage disadvantage when they return.

Overall, we find that the most important determinants of the gender wage gap vary highly among countries, and the analysis of these components highlights important policy considerations. We can see that the motherhood penalty is higher, and contributes significantly to the overall gender wage gap when policies are unsupportive of maternal employment, as seen in the CEE countries. Greater gender equality in these countries can only be achieved through family policy reforms and significant shaping of cultural attitudes. The fatherhood premium is an important contributor to the gender gap in most countries. Even when mothers do not receive lower pay than non-mothers, they do not see the gains that fathers do after having a child, leading to the overall divergence of wages by gender. This difference can only be addressed by policies encouraging the greater involvement of fathers in childcare duties. Finally, the low motherhood penalties – and gender wage gaps - seen in the Southern European countries do not reflect a more favorable situation for women, as these are likely to arise due to their low employment, and the selection of high-skill, highly paid women and mothers into the labor market. Since the increase in employment of women and mothers is a policy goal in these countries and the EU overall, it is

important to remember that these would likely lead to an increase in the motherhood penalty and the gender wage gap, unless policies and cultural norms are also addressed at the same time.

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APPENDIX

Table A. 1. Structure of the data by country and gender

Country	# observations	% working	% working	% working	% parent	% parent	% parent
	total	total	men	women	total	men	women
Austria	39,641	0.710	0.866	0.506	0.491	0.502	0.477
Belgium	37,396	0.520	0.670	0.348	0.494	0.489	0.500
Bulgaria	33,455	0.708	0.732	0.682	0.491	0.451	0.539
Czech Republic	58,323	0.612	0.763	0.476	0.519	0.484	0.559
Denmark	43,107	0.796	0.855	0.729	0.596	0.590	0.603
Estonia	42,781	0.640	0.670	0.609	0.606	0.562	0.656
Finland	64,723	0.636	0.685	0.583	0.543	0.520	0.569
France	80,101	0.589	0.719	0.454	0.554	0.545	0.564
Germany	70,149	0.524	0.737	0.297	0.471	0.513	0.413
Greece	41,242	0.589	0.732	0.442	0.482	0.464	0.503
Hungary	72,515	0.648	0.711	0.585	0.520	0.488	0.557
Iceland	22,077	0.844	0.900	0.782	0.683	0.656	0.720
Italy	146,542	0.616	0.776	0.455	0.495	0.483	0.509
Lithuania	34,815	0.563	0.575	0.550	0.514	0.487	0.544
Luxembourg	41,070	0.523	0.746	0.315	0.568	0.567	0.569
Netherlands	49,548	0.580	0.848	0.213	0.527	0.569	0.438
Norway	43,864	0.788	0.868	0.687	0.620	0.610	0.633
Poland	102,285	0.631	0.717	0.547	0.572	0.544	0.603
Portugal	41,637	0.693	0.758	0.629	0.541	0.516	0.567
Romania	18,724	0.461	0.559	0.370	0.317	0.279	0.361
Slovenia	94,320	0.565	0.628	0.503	0.550	0.495	0.618
Spain	110,032	0.595	0.731	0.453	0.523	0.504	0.545
Sweden	44,674	0.776	0.840	0.695	0.606	0.611	0.599
Slovak Republic	51,124	0.614	0.693	0.537	0.525	0.498	0.554
United Kingdom	46,640	0.740	0.840	0.622	0.493	0.493	0.492

Table A. 2. Shares of individuals by parenthood and employment status – by country and gender

Country	% working & non-parent	% working & parent	% not working & non-parent	% not working & parent	% working & non-parent	% working & parent	% not working & non-parent	% not working & parent	% working & non-parent	% working & parent	% not working & non-parent	% not working & parent
	total	total	total	total	men	men	men	men	women	women	women	women
Austria	0.383	0.336	0.127	0.155	0.406	0.464	0.092	0.038	0.350	0.158	0.175	0.316
Belgium	0.254	0.279	0.266	0.201	0.307	0.367	0.229	0.098	0.192	0.175	0.310	0.323
Bulgaria	0.352	0.359	0.160	0.130	0.378	0.360	0.173	0.089	0.320	0.357	0.144	0.179
Czech Republic	0.289	0.311	0.186	0.214	0.366	0.400	0.179	0.055	0.218	0.229	0.192	0.361
Denmark	0.308	0.487	0.111	0.093	0.331	0.524	0.092	0.053	0.281	0.445	0.134	0.140
Estonia	0.219	0.405	0.174	0.203	0.239	0.423	0.216	0.121	0.196	0.385	0.127	0.293
Finland	0.279	0.351	0.197	0.173	0.296	0.386	0.229	0.090	0.261	0.312	0.162	0.265
France	0.252	0.342	0.204	0.202	0.286	0.436	0.194	0.085	0.216	0.240	0.214	0.329
Germany	0.262	0.259	0.231	0.247	0.297	0.435	0.195	0.073	0.224	0.071	0.270	0.435
Greece	0.298	0.321	0.220	0.161	0.349	0.396	0.188	0.067	0.241	0.237	0.256	0.266
Hungary	0.315	0.335	0.170	0.180	0.342	0.380	0.175	0.102	0.285	0.285	0.164	0.266
Iceland	0.259	0.586	0.059	0.097	0.286	0.612	0.060	0.041	0.222	0.551	0.058	0.169
Italy	0.323	0.329	0.182	0.166	0.366	0.426	0.151	0.056	0.272	0.213	0.219	0.296
Lithuania	0.222	0.334	0.272	0.171	0.228	0.339	0.302	0.131	0.215	0.329	0.239	0.217
Luxembourg	0.259	0.295	0.165	0.282	0.330	0.434	0.128	0.108	0.188	0.158	0.202	0.452
Netherlands	0.272	0.320	0.197	0.211	0.339	0.511	0.107	0.044	0.178	0.051	0.324	0.447
Norway	0.299	0.492	0.102	0.107	0.325	0.545	0.087	0.043	0.265	0.422	0.122	0.190
Poland	0.250	0.409	0.179	0.163	0.279	0.458	0.178	0.085	0.217	0.353	0.180	0.249
Portugal	0.295	0.416	0.165	0.124	0.324	0.443	0.162	0.070	0.264	0.388	0.167	0.180
Romania	0.276	0.192	0.374	0.157	0.330	0.228	0.371	0.071	0.224	0.156	0.378	0.243
Slovenia	0.237	0.366	0.249	0.148	0.299	0.358	0.247	0.096	0.166	0.375	0.252	0.207
Spain	0.296	0.323	0.181	0.200	0.328	0.406	0.172	0.094	0.260	0.228	0.192	0.320
Sweden	0.300	0.477	0.115	0.107	0.308	0.533	0.100	0.060	0.291	0.405	0.135	0.170
Slovak Republic	0.259	0.363	0.199	0.178	0.299	0.401	0.203	0.096	0.218	0.324	0.194	0.263
United Kingdom	0.392	0.352	0.117	0.140	0.400	0.440	0.106	0.054	0.382	0.240	0.130	0.248

Table A. 3. Summary statistics for wage rates and working time by gender and parenthood status

Country	wages						working time					
	men			women			men			women		
	total	parent	childless	total	parent	childless	total	parent	childless	total	parent	childless
Austria	15.44	15.76	14.83	12.90	12.43	13.07	42.08	42.28	41.92	39.60	38.54	40.20
Belgium	18.65	19.27	17.28	17.08	17.23	16.50	41.14	41.42	40.79	38.58	38.24	38.92
Bulgaria	2.80	2.96	2.66	2.29	2.25	2.41	42.19	42.42	42.19	41.21	41.20	41.22
Czech Republic	118.20	126.48	108.18	90.57	88.66	92.50	43.26	43.85	42.74	40.70	40.40	41.10
Denmark	193.14	201.54	178.48	162.84	164.18	159.81	39.85	40.05	39.52	37.66	37.53	37.80
Estonia	58.32	62.97	52.72	40.21	41.00	40.79	41.55	41.77	41.27	40.15	40.26	40.05
Finland	19.95	21.28	17.71	15.56	15.93	15.17	40.50	40.59	40.34	38.35	38.14	38.56
France	15.59	15.72	14.67	13.89	13.59	13.60	40.90	41.44	40.11	38.07	38.06	38.13
Germany	19.62	20.27	18.19	16.28	15.70	16.46	43.16	43.22	43.05	40.79	39.17	41.35
Greece	8.32	9.07	7.21	7.67	8.38	6.90	41.20	41.10	41.39	38.41	37.34	39.32
Hungary	775.94	815.87	737.11	685.43	643.77	723.89	41.29	41.43	41.17	40.09	39.94	40.27
Iceland	2118.08	2266.43	1764.55	1622.43	1679.30	1486.34	48.31	48.75	47.68	41.35	40.88	42.23
Italy	11.73	12.41	10.56	11.12	11.67	10.36	40.86	41.09	40.75	37.16	36.27	38.24
Lithuania	10.13	10.28	9.94	8.39	8.15	8.81	40.52	40.76	40.24	39.23	39.38	39.12
Luxembourg	24.25	24.53	22.75	20.54	18.94	21.52	42.55	42.75	42.41	40.52	39.67	41.54
Netherlands	24.12	25.33	21.97	19.86	22.19	19.22	39.09	39.16	39.01	37.41	36.92	37.58
Norway	220.62	229.76	201.28	172.63	169.59	175.89	40.67	40.75	40.58	37.31	36.98	37.97
Poland	13.56	14.12	12.55	13.02	12.92	13.36	43.16	43.61	42.66	39.63	39.54	39.78
Portugal	6.14	6.47	5.33	5.66	5.56	5.75	41.63	42.14	41.06	39.40	39.54	39.39
Romania	5.93	5.93	5.80	5.19	4.77	5.53	41.81	42.25	41.74	40.79	41.23	40.64
Slovenia	1860.68	1948.40	1574.80	1736.54	1667.70	1722.20	41.36	41.46	41.30	40.67	40.66	40.72
Spain	10.52	11.14	9.30	9.72	10.46	8.96	42.00	42.49	41.53	39.23	38.61	39.89
Sweden	172.14	178.15	158.98	135.28	132.68	136.91	38.75	38.76	38.78	38.22	38.09	38.42
Slovak Republic	103.64	106.92	98.59	83.12	78.53	88.56	42.41	42.79	42.16	40.40	40.24	40.77
United Kingdom	14.12	15.27	12.95	11.53	12.13	11.40	44.43	44.82	43.92	39.80	38.06	41.06

Table A. 4. Summary statistics for key demographic variables - by gender

Country	Married		Age		Education (ISCED 1+2)		Education (ISCED 3)		Education (ISCED 4)		Education (ISCED 5)	
	men	women	men	women	men	women	men	women	men	women	men	women
Austria	0.71	0.72	42.62	42.26	0.11	0.23	0.59	0.46	0.09	0.13	0.20	0.18
Belgium	0.66	0.67	41.99	41.66	0.24	0.26	0.36	0.29	0.03	0.03	0.37	0.43
Bulgaria	0.66	0.79	42.55	42.92	0.23	0.23	0.61	0.50	0.01	0.01	0.16	0.27
Czech Republic	0.68	0.81	41.91	42.31	0.06	0.10	0.78	0.73	0.01	0.02	0.16	0.15
Denmark	0.75	0.77	44.68	44.12	0.17	0.17	0.50	0.40	0.00	0.00	0.33	0.42
Estonia	0.63	0.69	42.40	42.86	0.15	0.10	0.61	0.46	0.04	0.08	0.19	0.35
Finland	0.67	0.74	43.94	43.88	0.16	0.11	0.44	0.38	0.01	0.00	0.39	0.50
France	0.63	0.65	42.51	42.43	0.21	0.25	0.50	0.42	0.00	0.00	0.29	0.33
Germany	0.76	0.71	44.69	43.48	0.06	0.10	0.46	0.45	0.06	0.10	0.42	0.36
Greece	0.64	0.76	41.40	41.75	0.30	0.31	0.37	0.33	0.07	0.08	0.26	0.28
Hungary	0.67	0.77	42.23	42.39	0.17	0.22	0.63	0.51	0.04	0.04	0.15	0.23
Iceland	0.63	0.65	42.42	42.57	0.26	0.28	0.37	0.25	0.09	0.07	0.28	0.41
Italy	0.63	0.71	42.48	42.86	0.44	0.43	0.40	0.36	0.05	0.06	0.12	0.15
Lithuania	0.81	0.87	44.24	44.57	0.11	0.06	0.39	0.25	0.27	0.31	0.24	0.37
Luxembourg	0.73	0.75	41.32	41.00	0.35	0.38	0.34	0.33	0.03	0.01	0.28	0.29
Netherlands	0.72	0.70	43.78	43.64	0.21	0.28	0.38	0.38	0.04	0.03	0.37	0.31
Norway	0.64	0.68	43.06	42.66	0.14	0.13	0.45	0.37	0.05	0.03	0.37	0.47
Poland	0.75	0.83	42.28	42.69	0.11	0.12	0.70	0.58	0.03	0.07	0.16	0.24
Portugal	0.69	0.75	42.49	42.70	0.73	0.63	0.16	0.17	0.00	0.00	0.11	0.19
Romania	0.52	0.67	39.95	41.08	0.14	0.22	0.62	0.50	0.05	0.05	0.19	0.22
Slovenia	0.59	0.71	43.14	43.79	0.18	0.21	0.64	0.53	0.01	0.01	0.16	0.25
Spain	0.66	0.71	42.15	42.30	0.49	0.46	0.22	0.21	0.01	0.01	0.29	0.33
Sweden	0.60	0.64	42.92	42.71	0.12	0.09	0.49	0.41	0.09	0.05	0.30	0.45
Slovak Republic	0.71	0.77	41.75	42.23	0.05	0.07	0.75	0.68	0.01	0.02	0.20	0.23
United Kingdom	0.68	0.66	42.62	41.49	0.14	0.15	0.46	0.44	0.02	0.01	0.38	0.40

Table A. 5. Gender wage estimates

Country	GWG estimate	GWG - Eurostat national sources (2005/2006)	GWG - Eurostat SES (2006-2012)
Austria	0.1683	0.2000	0.2431
Belgium	0.0846	0.0700	0.1001
Bulgaria	0.1994	0.1400	0.1304
Czech Republic	0.2550	0.1800	0.2345
Denmark	0.1606	0.1700	0.1683
Estonia	0.3379	0.2500	0.2873
Finland	0.1942	0.2000	0.2010
France	0.1236	0.1100	0.1581
Germany	0.1747	0.2200	0.2243
Greece	0.0877	0.1000	0.1980
Hungary	0.0881	0.1100	0.1743
Iceland	0.2146	N/A	0.1970
Italy	0.0603	0.0900	0.0563
Lithuania	0.1824	0.1600	0.1613
Luxembourg	0.1573	0.1400	0.0930
Netherlands	0.1636	0.1800	0.1861
Norway	0.2338	0.1600	0.1603
Poland	0.0371	0.1200	0.0808
Portugal	0.0843	0.0800	0.1119
Romania	0.1492	0.1000	0.0935
Slovenia	0.1262	0.0800	0.0314
Spain	0.0826	0.1300	0.1769
Sweden	0.2755	0.1600	0.1615
Slovak Republic	0.2225	0.2200	0.2170
United Kingdom	0.1392	0.2100	0.2069

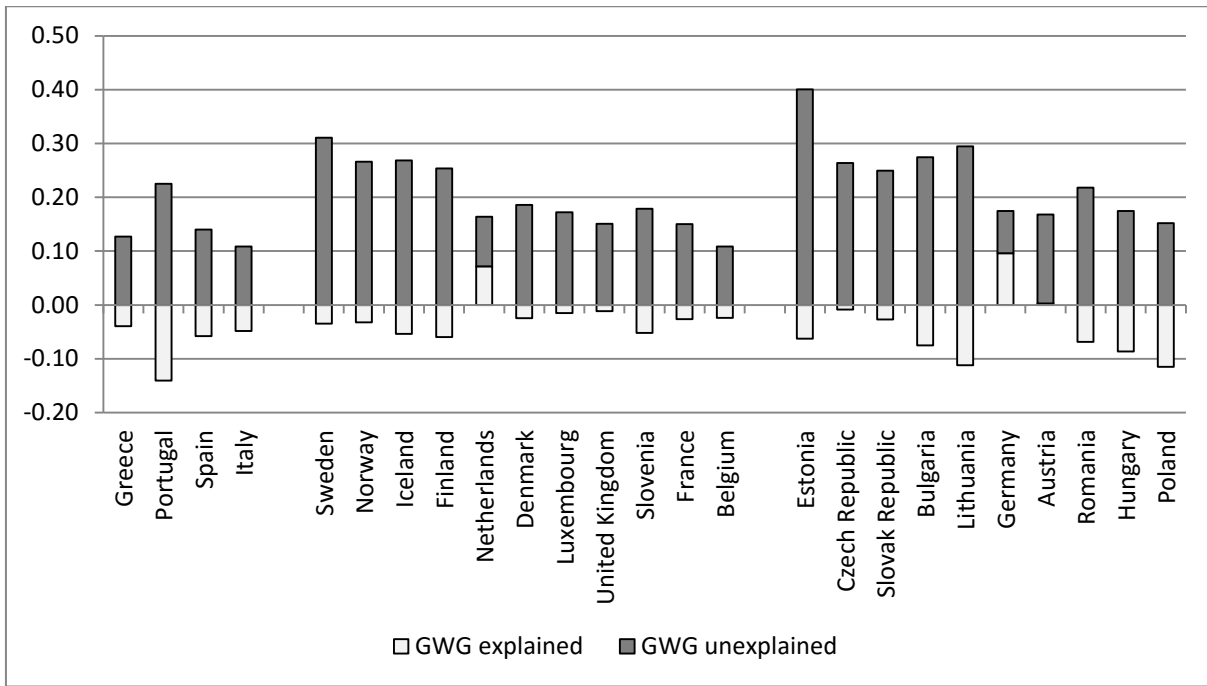
Notes: GWG estimate refers to the estimate obtained in the analysis based on EU-SILC data.

Table A. 6. The contributions of the family gaps and the gender gap among childless individuals to the overall gender wage gap: comparative perspective

Country	Observations	Group	Gender wage gap	Family gap, women	Family gap, men	Gender gap, childless	Contribution of family gap among women to GWG	Contribution of family gap among men to GWG	Contribution of gender gap among childless to GWG
Italy	90249	A	0.06	0.11	0.15	0.03	-134%	172%	46%
Greece	24226	A	0.09	0.21	0.29	0.02	-129%	197%	24%
Spain	59390	A	0.08	0.14	0.16	0.06	-100%	126%	69%
Portugal	27585	A	0.08	-0.06	0.13	-0.03	46%	98%	-36%
Iceland	16612	B	0.21	0.10	0.23	0.12	-22%	56%	57%
Slovenia	30340	B	0.13	0.07	0.28	0.02	-22%	90%	17%
Belgium	12239	B	0.08	0.03	0.12	0.04	-17%	76%	42%
Netherlands	16747	B	0.16	0.06	0.14	0.09	-17%	53%	56%
Finland	25037	B	0.19	0.03	0.17	0.11	-10%	57%	57%
United Kingdom	33669	B	0.14	0.03	0.17	0.06	-8%	64%	44%
Denmark	19666	B	0.16	0.00	0.13	0.08	0%	49%	50%
Norway	18482	B	0.23	-0.09	0.15	0.08	8%	39%	36%
France	28005	B	0.12	-0.03	0.09	0.05	12%	42%	41%
Sweden	18140	B	0.28	-0.11	0.09	0.16	27%	18%	57%
Luxembourg	12992	B	0.16	-0.20	0.00	0.07	57%	-1%	47%
Estonia	18950	C	0.34	-0.02	0.15	0.23	3%	26%	68%
Bulgaria	23102	C	0.20	-0.03	0.09	0.14	8%	23%	70%
Czech Republic	19790	C	0.26	-0.05	0.13	0.17	10%	27%	67%
Austria	27936	C	0.17	-0.06	0.07	0.11	11%	23%	65%
Germany	21508	C	0.17	-0.05	0.07	0.13	16%	23%	76%
Lithuania	11240	C	0.18	-0.08	0.08	0.09	26%	25%	49%
Slovak Republic	17138	C	0.22	-0.13	0.09	0.10	34%	23%	43%
Poland	64292	C	0.04	-0.03	0.11	-0.05	52%	183%	-133%
Hungary	43146	C	0.09	-0.10	0.08	-0.01	58%	51%	-8%
Romania	4847	C	0.15	-0.16	0.02	0.06	65%	6%	42%

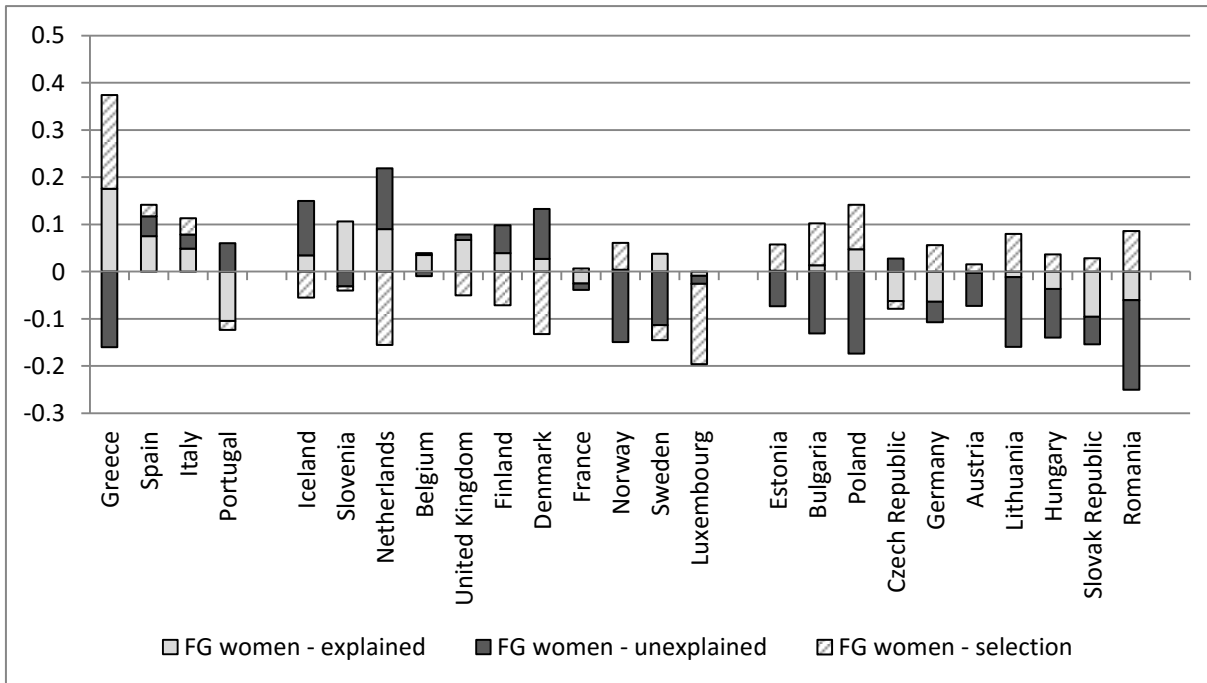
FIGURES

Figure A. 1. Gender wage gap - decomposition by country



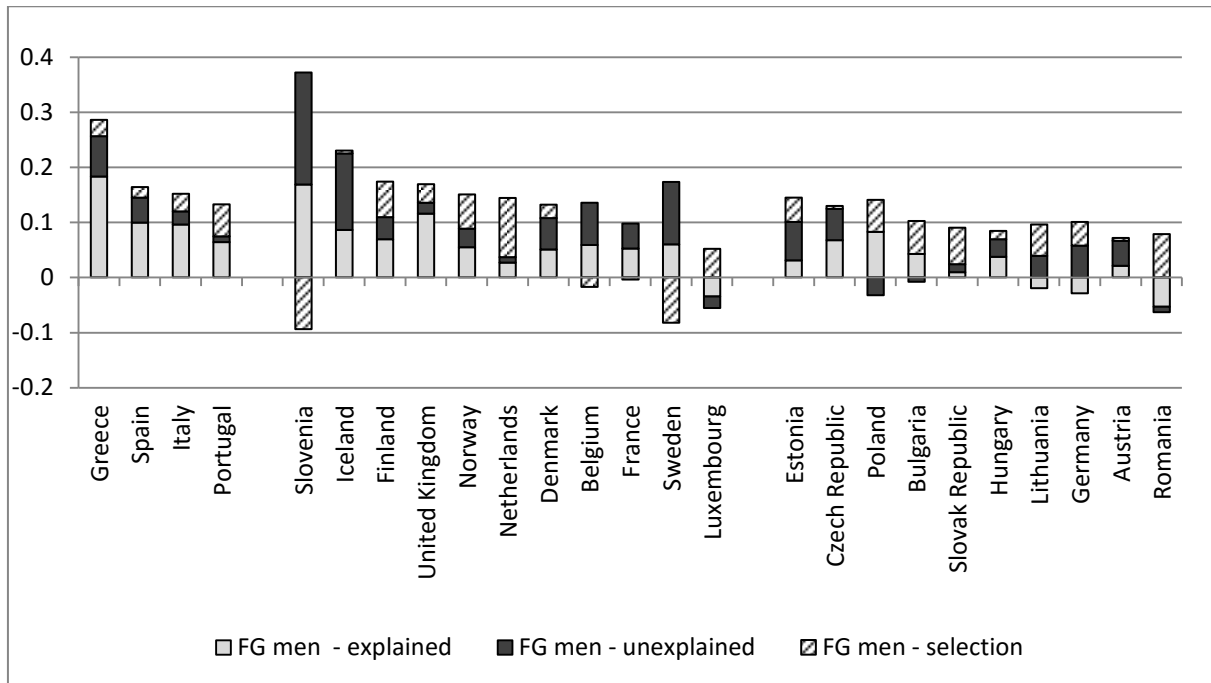
Source: Estimates based on EU-SILC data.

Figure A. 2. Family wage gap among women - decomposition by country



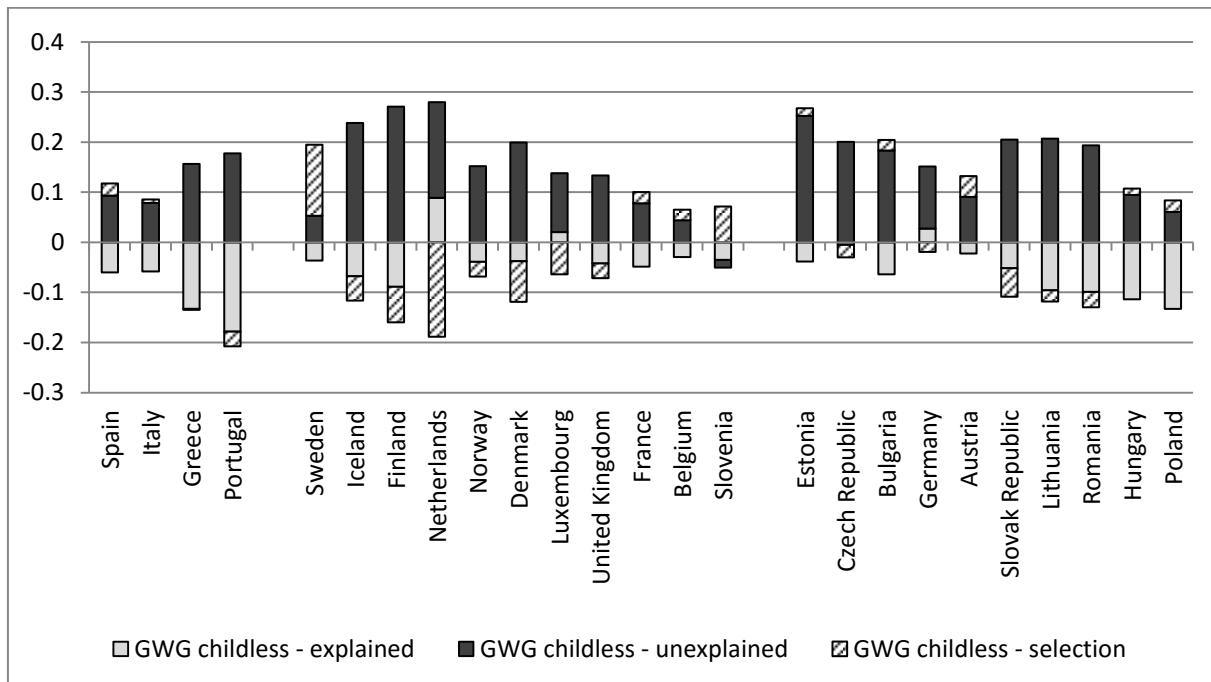
Source: Estimates based on EU-SILC data.

Figure A. 3. Family wage gap among men - decomposition by country



Source: Estimates based on EU-SILC data.

Figure A. 4. Gender wage gap among childless individuals - decomposition by country



Source: Estimates based on EU-SILC data.