Educational specificity of the effect of public policies on completed fertility

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Abstract

In this paper we aim at assessing to what extent completed fertility vary across contexts characterized by policies that support different gender division of labor models. We analyze key family policies and labor market factors, and additionally consider the dimension of gender norms, that can act both as a moderator and a confounding factor for policy effects. We argue that policies are likely to have different fertility effects across levels of education. This is due to differences in the costs associated with having children and to different family values. We utilize the European Union Survey on Income and Living Conditions (SILC) for 16 countries and apply multi-level models combined with country-level data.

We find that reduced working hours for men and gender egalitarian norms have a positive impact on fertility. Furthermore, their positive impact is greater among highly educated women. Childcare enrollment and women's part-time also show the expected positive pattern according to education, but their overall effect is not significant. The influence of monetary transfers is negative, with a clear negative gradient according to education. Finally, we find that where gender norms are more egalitarian, fertility tends to be higher. In sum, policies that support gender equality in paid and unpaid work have a positive impact on fertility, while policies supporting gender role specialization in the family have a depressing effect.

Key words: fertility, public policies, gender inequality, gender division of labor, Europe.

1 Introduction

The shift from a negative to a positive correlation between female participation rates and fertility has triggered much debate. A broadly shared explanation for this is that societies with high female employment levels have also introduced measures that help reconcile motherhood with careers (Bernhard, 1993; Brewster and Rindfuss 2000). Research highlights two dimensions, namely the organization of work and the provision of childcare. Gender relations are also key since they influence the degree to which it is acceptable that women with small children work, or that fathers are involved in childcare and housework (Lewis 1998; Hakim, 2000; Gershuny 2000). The debate on work-family reconciliation has perhaps been overly focused on women's roles while neglecting men's behavior.

In this paper our focus is on the fertility effects of institutions and policy. An extensive literature has studied the effect of changes in *family* policies on fertility (see Gauthier 2007 for a review). The evidence is rather ambiguous. On balance, it finds only a weak positive relation between reproductive behavior and a variety of policies. A first contribution of this chapter is to broaden the institutional and policy context and consider several dimensions of government intervention related to care services, labor market conditions, income transfers and taxation. Policies in these domains are hypothesized to influence fertility by shaping the gender system.

For two reasons, we also consider the influence of gender values. Firstly, gender equity dynamics could be associated with policy changes and, secondly, the two may interact. Bonoli (2008) argues that family-friendly policies cannot be expected to impact positively on fertility in a traditional society. We therefore examine whether the effects of policies differ according to the degree of gender egalitarianism prevalent in the society.

A second contribution of this paper is to use individual-level data in order to examine how policy effects vary according to individual characteristics. This, we believe, may

especially be the case across levels of education. Some policies (e.g., leaves, formal childcare) can promote gender equality by reducing the opportunity costs of children. Other policies, like child benefits, may only help reduce the direct costs of children. Surprisingly, the potential differential effects of policies on women with different characteristics has received little attention in previous research. Here we show that the effects of most policy indicators have very different impacts according to the educational level of women in a theoretically interpretable manner, thus providing a useful way of investigating contextual effects.

By examining fertility effects across women's education level we try to bridge the gap between macro-level studies that show a positive relationship between labor force participation and fertility, and micro-level studies that typically find a negative relationship between the two (Brewster and Rindfuss 2000; Ahn and Mira 2002). The macro level changes have generally been attributed to institutional and policy changes. At the micro level, fertility is usually inversely related to education. But in some countries, like Sweden, highly educated women now exhibit higher, or at least not lower, fertility than the less educated (Andersson, 2000). This pattern may be unfolding in a number of countries (Kravdal and Rindfuss 2008; Shang and Weingberg, 2013).

2 The policy context of fertility

Comparative macro-level analyses based on aggregate data suggest a positive correlation between Total Fertility Rate (TFR) and public spending on family policies or childcare availability (e.g., Finch and Bradshaw 2003; Bonoli 2008). But a number of studies find weak or even contradictory effects (Castles 2003; Gauthier 2007; Hoem 2008). Studies using micro-level data also find mixed evidence. Rindfuss et al (2007) find that childcare services have a positive effect on the timing of first births in Norway; Baizán (2009) finds a substantial effect of childcare enrollment on first births as well as higher order births in Spain. However, a study by Rønsen (2004) reports no statistically significant impact of childcare costs and its availability. Aassve et al. (2006) find that child benefits also have an effect on birth timing, but they do not find clear evidence regarding their effect on overall fertility levels. Kalwij (2010) analyzes the impact of changes in expenditure on family allowances, maternity- and parental-leave benefits, and childcare subsidies on fertility. He finds no significant effects of family allowances,

but maternity and parental leaves as well as childcare provision causes women to have children earlier in life and to have more children. In her review, Anne Gauthier (2007) highlights that in the majority of these studies, if a significant effect of policies on fertility is found, this relates more to the timing of fertility and the effects are usually small. Moreover, especially in the case of cash benefits, the effects are stronger for higher order births.

This mixed evidence can be partially explained by methodological problems (see Neyer and Andersson, 2008). Several authors highlight the possibility that policies may be endogenous to fertility in the sense that the implementation of any given policy can be a response to an actual or anticipated trend in birth behavior (Hoem 2008). For example, while it is commonly assumed that public childcare influences childbearing, it may instead be the case that in societies with higher levels of fertility there is more pressure to expand childcare. On the other hand, policymakers may respond to declining fertility by introducing pro-natal reforms to family policy.

Policy changes over time and variations across countries may also reflect other underlying phenomena, such as an adaptation to a changing gender system. Esping-Andersen and Billari (2012) depict the gender equality *revolution* as a process of diffusion of new norms. A recovery of fertility is expected when gender equity becomes dominant. The starting point is triggered by the rise in women's education[1]. Some institutional characteristics of societies (trust, stratification) may speed up or hinder that process.

McDonald (2004) explains the very low levels of fertility existing in many advanced societies as the result of incoherence in the degree of gender equity embedded in different institutional spheres. He argues that gender equity in both societal institutions and in the family is necessary for fertility to rise—otherwise the costs of fertility fall disproportionally on women. Arpino and Tavares (2013) provide empirical evidence that where gender equity only prevails in individual-oriented institutions, fertility is

[1] Key discontinuities that trigger the start of changes in the long term are brought about by improving household technologies and modern contraception. Other factors that could be included are the increase in demand for female labor, typical of postindustrial and knowledge economies, and the historical reduction of fertility that frees women's time for other activities. Nevertheless, none of these factors can be considered as completely exogenous.

likely to remain low. Along these lines, Myrskyla et al. (2011) show that gender equality is a necessary condition for the relationship between fertility and high-development to shift from negative to positive. This is consistent with the idea that some countries are heading towards a new equilibrium because they have gradually broken free from the fertility constraints associated with the growth of female labor market participation.

During this gender roles transition, governments can implement policies to promote gender equality by making it easier for parents (especially mothers) to combine work and family responsibilities. This, in turn, helps households have the number of children they desire at the time of their choice (Thévenon and Luci 2012). The evolution of gender norms seems to be closely related to variations in the institutional context of support to working parents (Anxo et al. 2007): for example, countries with greater childcare coverage tend to have higher maternal labor force participation rates and less rigid gender roles. We must underline the role of institutional arrangements, not only in creating new opportunity structures for making family formation decisions, but also in influencing family values in a dynamic way (Bowles, 1998; Jakee and Sun, 2001).

Family policies, gender norms and labor market conditions are interrelated, and this has to be taken into account when studying the relationship between policies and fertility. It is therefore not surprising that past studies find contradictory results. The differences in welfare regimes (Esping-Andersen 1999, 2009) capture how different societies provide family care. Generally speaking the Southern and Eastern European countries show the lowest levels of de-familialization, and Denmark the highest (Saraceno 2010). Even if we focus exclusively on family policies, many different "packages" can be adopted by each country. But focusing only on a single aspect of the policy mix can be misleading. Thévenon (2011) employs a principal component analysis to identify clusters of countries with broadly comparable family policy packages. The gender and care dimensions have been progressively incorporated into the analyses of welfare regimes (Lewis 1992). Pascal and Lewis (2004) identify five components—paid work, care, income, time and voice— within which gender equity policies must be constructed. The "care regimes" identified by Bettio and Plantenga (2004) partially overlap with the typology of policy regimes initially proposed by Esping-Andersen (1990).

Welfare states vary considerably in terms of their pace of introducing policies that mitigate the gendered costs of providing this care, such as parental leaves, public child care, services for the elderly, and family allowances. According to Pfau-Effinger national differences in family policies can largely be explained by the fact that in each welfare state two types of welfare arrangements overlap. On the one hand, there are policies directed at family and gender relations, and, on the other, those concerning social security. Both vary in different ways in West European welfare states (Pfau-Effinger, 2004). This author proposes five ideal-typical family models: the family economy model, the housewife model; the (female) part-time caring model, the dual breadwinner/state care model, and the dual breadwinner/dual carer model (Pfau-Effinger 2004). Crompton (1999) adds a dual-earner/marketized-caregiver model, which seems to be the dominant model in the USA. Gender ideologies tend to be related to state welfare policy packages (Gornick and Meyers, 2003).

In some countries these policy models have been substantially modified in the last decade. Germany has greatly expanded childcare provision and has implemented a new parental leave policy implying a shorter period of absence from work for women and the encouragement of paternal child care. These steps constitute a break with past practice, such as half-day school timetables and the male breadwinner oriented tax system (Bujard, 2011). In Spain several regions have significantly increased the availability of childcare, and a (short) father's leave has been introduced.

3 Policy changes and the unfolding of the gender transition

In recent decades, then, societies have moved in the direction of more gender equality. Cross-national variations are substantial but it is possible to summarize overall policy trends in four stages, starting from the situation in the 1960s, when all countries were dominated by the male breadwinner model. In the first stage of the gender transition, women enter the labor market, but there is no institutional adaptation to women's participation. This often leads to a "double shift" scenario with declining fertility.

In the second stage, there is some institutional adaptation to women's new roles. This may include the promotion of part-time jobs, the introduction of parental leaves, and the

expansion of formal childcare provision. At this stage men's roles have only marginally changed (Kan, Sullivan, and Gershuny, 2011).

In the third stage, institutional adaptation begins to focus more on men's roles, including the promotion of fathers' leaves or adapting the work environment to the growing caring role of men -- such as shorter working hours or more flexible time schedules. Men take an increasing responsibility for care and domestic work and their labor market involvement starts to change, for instance by increasing their use of paternity leave.

The fourth stage would be a transition to a fully egalitarian model, in which both men and women are workers and carers to a similar extent (the "dual earner/dual caregiver" society). Of course no society has reached this stage yet. Increasing rates of female employment have narrowed the gender gap in labor force participation, but gender differences persist in such areas as career breaks, occupational segregation, working hours, or pay. And although men's engagement in domestic work and care giving has increased in many countries, nowhere does it match women's influx into paid employment.

In reality, the 4 stages overlap, and the timing of changes is likely to be particularly important for fertility outcomes. If change comes late but very rapidly, as in the Spanish case, this might provoke very low fertility. If institutions begin to adapt early, as in Scandinavia, then a higher fertility level is easier to sustain.

Differences across welfare regimes reflect also variations in the way countries have experienced the gender transition. Liberal and social democratic regimes have developed part-time employment and de-familized childcare; in more familialistic countries, we observe more resistance to change (less labor market flexibility, less availability of formal childcare, etc). Some countries, notably France and Belgium, are in an intermediate position and have fairly well-developed childcare provision.

In the context of countries with high levels of women's education and where a large fraction of women has joined the labor force (i.e. all the countries considered in this study), it can be hypothesized that public policies that support a gender egalitarian model should have an overall positive effect on fertility. In this study we use several

indicators of policies that are expected to reflect key dimensions of the effect of the gender system on fertility (see the section on data for details on the indicators used in the analyses). In particular, we focus on "work-family reconciliation" polices, for both men and women, in the areas of working time regulations and child care (including policies that provide time or money to care)[2]. For example, childcare services favor the combination of work and parenthood and therefore should have a generally positive effect on fertility. Women take the primary responsibility for the day-to-day needs and supervision of children in most societies, and therefore, if care services are provided by the state or the market at an affordable cost, women are generally the main beneficiaries. This depends to an important extent on the regulations and subsidies applying to formal care existing in a society. Defamilialization of family services are thus one of the key preconditions for gender equity.

In principle, the existence of paid parental leave for women can enhance the compatibility of paid and unpaid work, and in fact in all countries studied exists a minimum paid leave period with return to job guarantee. However, the effect on fertility of this variable may not be clear cut, since very long leaves (i.e. more than a year) tend to affect negatively labor force attachment[3]. Unfortunately, a measure of father's leave use is not available for all the countries studied, but obviously it would be a powerful indicator of an evolution towards a gender equal arrangement.

A high number of standard working hours for men can be considered as a barrier in their involvement in childcare and unpaid work[4]. We therefore expect that this indicator negatively affects fertility. Women's part-time work may facilitate the combination of paid and unpaid work, although it is also consistent with little gender equality in unpaid work and a secondary role of women in paid work. Some policies, such as child benefits and tax rebates, may only be aimed at reducing the direct cost of children, and are not intended to promote gender equality. Nevertheless, in some instances these policies imply a bread-winner model arrangement, that actively discourages women's labor

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[2] Of course, we acknowledge that many other polices have a potential impact on fertility or on gender relations. For instance, health and education subsidies decrease the cost of children for parents, and elderly care policies may influence paid work involvement of women, etc. Here, nevertheless, we focus on polices that directly influence the gender division of labor for parents, which is considered as a critical element by the theoretical arguments cited above.

[3] Additionally, short leaves have been associated to poorer health and developmental outcomes for children (Waldfogel et al 2002).

[4] Time use studies point to that conclusion; see for instance Hook (2010).

force participation and men's involvement in childcare. These policies are more likely to be the core of the governmental family policy strategy in more traditional settings.
In considering the potential effects of each of these policies on fertility it should be taken into account the degree of coherence of the different policies and their stability in time. Furthermore, clear cut effects may not be found if a strong heterogeneity in gender norms is found in the population. The effects of concrete political measures are not simply a reflection of material interests of individuals but also of cultural values and ideals, which influence the degree to which policies are accepted by the population and their impact on social practices of individuals.

4 Gender norms

If the effects of policies can be modified according to the prevailing gender norms existing in different countries, this suggest the convenience of including a measure of them in the analyses. Furthermore, as outlined above, the effects of gender norms and policies influence each other, reinforcing their effects in the course of time. Therefore, we expect that the effect of policies favoring the combination of work and parenthood to be stronger, the more gender equal a society is (i.e., in statistical terms, we expect a positive interaction between policies and macro level gender equality). By the same token, policy measures that conflict with a gender equality model or consistent with gender role specialization, such as long parental leaves, certain types of family benefits, or even part-time work, in combination with a high proportion of adherence to gender equality norms in the population, should be negatively associated with fertility levels.

5 Differential impact of policies

Although policy factors provide a common context to all individuals, they do not affect all of them in the same way. Societies provide particular structures of incentives and costs to having children, that apply to some individuals (or couples) more than to others. In particular, the decline in women's status upon the birth of a child that is often observed, is closely related to her employment situation and educational level. The economic and psychic costs of having children tend to be particularly high for highly educated women if the combination of parenthood and paid work is difficult. As a consequence, fertility drops are generally severe for them in the early stages of the

gender transition, while educational differentials tend to disappear, or even reverse, in more advanced stages. Opportunity cost, i.e. the loss of income related to time out of the labor force to care for children, have been rightly highlighted in the literature, while the direct economic costs seem to be relatively less important for women with high market productivity. However, as the educational level of women increases other non-economic costs of a reduction of labor force participation associated to having children are likely to become more important, such as the detachment from paid labor force, the loss of social networks, loss of skills, loss of self esteem, and especially the loss of gender equality in the couple. Education is associated to a higher prevalence of equality values, for both women and men, and thus these costs are likely to be more relevant for highly educated individuals. It is, for example, widely documented that higher educated couples are far more disposed towards gender egalitarianism (Coltrane 2000; Hook 2010). Less educated women not only face lower opportunity costs of interrupting careers but are also more likely to find themselves in precarious labor market situations, making conventional gender roles appear more attractive.

Our general hypothesis is therefore that the higher the level of gender equality prevalent in the welfare regime institutions, the less a negative association between women's level of education fertility will be found. This logic can be also applied to specific contextual factors or policies, to the extent that they give support to a particular gender arrangement. We would therefore expect that welfare states with a strong gender egalitarian profile should help narrow the fertility gap between higher and lower educated women. More specifically, we hypothesize the following:

a) The availability of formal childcare should have a stronger positive effect on the fertility of high educated women than for low educated women, to the extent that their involvement in paid work is greater and because they face higher opportunity costs of childbearing.

b) Well paid leaves have a positive effect on fertility, especially for high educated women. In fact, from the economic theory, a higher pay rate (e.g. 100 per cent instead of 80 per cent of the salary) means a reduction of the opportunity cost of childbearing and thus may be expected to have a positive effect on fertility (Gauthier and Hatzius, 1997). This effect is expected to be stronger for highly educated women who have higher opportunity costs.

c) Policies that promote men's involvement in childcare and domestic work have a positive effect on the fertility of highly educated couples. A high number of standard working hours for men can be considered as a barrier in their involvement in childcare and unpaid work.

d) The availability of part-time work facilitates the combination of paid and unpaid work. Thus, a generally positive effect on fertility can be expected. In the early stages of the gender transition, a large fraction of women may seek this arrangement, excepting the low educated, which may prefer full time housewifery (Hakim, 2000). However, women's part-time work also favors a gender specialization model in which women are secondary earners and main care givers, which may not be very attractive to highly educated women. Furthermore, part-time work characteristics differ considerably between countries. In Southern Europe it is often associated with precarious working conditions, while in the Nordic countries and the Netherlands it is more compatible with career jobs, potentially enhancing fertility of relatively more educated women. These contradicting effects make it difficult to predict the effects of this variable.

e) Child benefits and tax deductions can be designed in a way that does not create disincentives for women's labor force participation (Gustavsson and Stafford 1994). However, they often reflect the logic of the conventional male breadwinner model (Orloff, 2002). On the whole, these kinds of policies can be hypothesized to have a higher positive impact on the fertility levels of low educated women.

6 Data and descriptive statistics

We utilize the EU-SILC longitudinal data for the years 2004 to 2009 for 16 Western and Southern European countries for which we also have contextual information. We restrict our analyses to the most recent observation of women aged 36 to 44 years, yielding a working sample of 69,213 women (the number of women per country ranges from 2,326 to 13,871). The dependent variable used in all the analyses is the total number of

own children living in the same household as the mother at the time of interview. This variable approximates the completed fertility of women.

The explanatory variables include, firstly, the respondent's age at the time of the survey and the highest educational level attained. We have coded education into three categories: some secondary education and less; completed secondary and/or post-secondary education (reference category), and university studies.

We complement the micro-level data with country-level data on policies, labor market conditions and values. We include data on family benefits, leaves, and childcare. Data on the first two are taken from the Comparative Family Policy Database (see Gauthier 2011 for details on the indicators and sources of data), while data on childcare enrollment are obtained from Eurostat, which aggregates micro-level data from EU-SILC. For most indicators data are available until recent years. We use contextual information reflecting the situation in the mid 1990s (1992-98), when on average, our sample of women had their children. When data are not available for this period we consider the oldest data available. In any case, variations over time on country-specific indicators are very limited.

Regarding family benefits, we include the following indicators:

- *Monthly family allowances* in US dollars (PPP adjusted) for the second child. We also tested for allowances for the first and third child but results were very similar to those reported.
- Value of *tax and benefit transfers* in US dollars (PPP adjusted) to a two-child family (one-earner-two-parent two-child families).

Measuring leave benefits is a hard task. There are important cross-country variations regarding overall length, level of compensation and eligibility criteria of maternity and parental leave (Ray et al. 2010; Wall, 2007). Saraceno and Keck (2009) notice that some countries, such as France, offer both very long and well compensated leave (see also Table 1). Other countries, like Spain, offer quite long leaves but pay only a short period of them, while still others, such as Greece, offer a leave that is also comparatively short. Moreover, while almost all developed countries envisage a period of maternity leave, some countries also offer parental and/or child-care leaves, i.e.

optional leave periods available after the period covered by the maternity leave scheme and usually not reserved to mothers. Similarly to Gornick and Meyers (2003), our indicator takes into account these three types of leave, their duration and level of compensation. In particular, we consider:

- Sum of weeks of *maternity, paternity and child-care leave* weighted by the level of cash benefits paid during each type of leave (measured by the percent of female wages in manufacturing; Gauthier, 2011). The resulting indicator can be interpreted as the total equivalent number of leave weeks paid 100% (considering average female salaries).

To measure childcare availability we would opt for using data on the offer of childcare places, but such data are not easily available. Instead our indicator is:

- The percent of *children aged 0-2 enrolled in formal childcare*, year 2005. Despite the fact that this indicator have some limitations (for a discussion see Saraceno and Keck, 2009), it is widely used in the literature.

To capture labor market conditions, we include two indicators:

- Standard number of *working hours per week for men*, year 2000.
- Share of *women working part-time*, year 2000.

Finally, in order to measure the spread of gender egalitarian values we utilize data from the World Values Survey and the European Values Study. We include data from the oldest wave for which our indicator is available (1999). Our measure of gender equality is based on a single item: "When jobs are scarce, men should have more right to a job than women". The questionnaire offers three possible answers: 1 'agree', 2 'disagree' and 3 'neither'. We recode the variable into a binary response: 0 is 'agree' or 'neither' and 1 is 'disagree' and calculate the percentage at the country level. From now on, we will refer to this measure as the Gender Equality indicator. We decided to use only one question instead of an index summarizing more than one item because the chosen indicator clearly measures views toward gender roles in the labor market and so it is the most relevant to our analysis focused on contextual factors facilitating the reconciliation of motherhood and a job career.

Table 1 shows the values of the macro-level independent variables described above and the average level of TFR for the period 1992-1998. Countries are ranked by decreasing level of (average) TFR.

Table 1 – TFR and macro indicators by country

Country	TFR	Family allowances	Tax and benefits transfers	Weighted leave weeks	Child care enrollment	Men working hours	%Women on part-time	Gender egalitarian values
Ireland	1.91	32.89	2357.33	9.80	20.00	41.56	32.77	74.50
Norway	1.86	100.22	3498.30	41.19	33.00	37.99	33.37	84.85
Finland	1.79	100.01	2513.59	79.01	27.00	40.09	14.27	87.07
Sweden	1.77	74.14	1753.46	49.95	53.00	39.11	20.29	94.95
Denmark	1.76	65.05	3902.45	32.23	73.00	38.53	21.60	91.60
United Kingdom	1.74	54.51	2044.02	7.79	29.00	42.79	38.73	73.17
France	1.71	110.93	2424.82	76.17	32.00	38.92	24.02	72.65
Luxembourg	1.70	150.89	6274.37	42.00	22.00	40.83	28.19	73.80
Belgium	1.59	128.72	5934.14	24.17	42.00	40.85	34.29	68.55
Netherlands	1.57	79.50	2974.99	15.43	40.00	36.43	59.09	81.10
Portugal	1.47	21.21	918.31	13.53	30.00	41.26	8.59	68.40
Austria	1.44	98.54	3674.28	49.64	4.00	40.62	27.11	61.85
Greece	1.33	14.56	2049.72	7.79	7.00	44.99	10.60	80.10
Germany	1.30	79.57	4676.07	39.71	16.00	40.60	35.55	73.03
Italy	1.24	79.61	2223.06	25.00	25.00	41.36	24.59	65.00
Spain	1.21	24.55	1152.96	14.86	39.00	41.82	16.56	75.90
Mean	1.59	75.93	3023.24	33.02	31.15	40.65	25.53	75.27

Note: for TFR, family allowances, tax and benefit transfers and weighted leave weeks we report the average value for the period 1992-1998. For the other variables data refer to a specific year (the closest available to 1998): 2000 for Child-care enrollment, 2005 for Men working hours and Women share part-time and 1999 for Gender egalitarian values.

One notices how countries tend to cluster. Northern European countries, with the highest fertility levels, are distinguished by relatively high scores in all the policy domains and, in particular, with regard to childcare enrollment and to gender egalitarian values. Other countries are characterized by high values on only one indicator. For example, Luxembourg and Belgium are characterized by generous family allowances and transfers, while the Netherlands has the highest share of women in part-time jobs.

At the low end of the TFR distribution we find Southern Europe, plus Austria and Germany. They are characterized by low levels of gender equality and unfavorable policy and labor market contexts. Interestingly, Italy shows relatively high levels of public spending on family allowances but low levels of childcare enrollment, long working hours, low part-time rates, and also a low score on the gender equality index. Spain performs poorly on all family benefit and labor market indicators, but scores relatively high in terms of childcare enrollment.

7 Methods

Since our dependent variable is a count variable, we employ Poisson regression models (Cameron and Trivedi, 1998) to estimate the association between contextual variables and fertility[5]. We use multi-level random effects models to take into account the non-independence of observations of individuals living in the same country.

8 Results

Table 2 presents the results of models predicting the number of children a woman has at age 36-44. Models 1 to 8 show the main effects of several contextual variables, considered one by one, taking into account the effects of women's age and education. As can be seen, the effect of education is negative since higher educated women have fewer children. The estimated variance of the country-level random effect (last row of Table 2) is statistically significant in all models, meaning that there is substantial variation across countries in the average number of children.

We can also observe a negative effect of family allowances for the second child on completed fertility. This holds also for family allowances for first and third births (not shown). When we introduce the interaction term between family allowance for the second child and education (Table 3. Model 1)[6] we can notice that its effect differs by levels of education: for all education groups the effect is negative, but for low educated women the effect is weaker. In fact, the effect of family allowance for the reference category (medium level of education) is negative (-0.00182) and statistically significant.

[5]We use the Vuong test to check for the presence of zero-inflation. Since, the test was rejected for each considered model specification, we employed the poisson model.

[6] These interaction coefficients are computed without including other contextual variables in the model.

The interaction with low education is positive and statistically significant but lower in magnitude, so that also the effect for low educated remains negative. A similar result is obtained using tax and benefit transfers (Table 2, Model 3 and Table 3, Model 2) and allowances directed to second and third births (not shown).

Table 2. Results of the regression models that estimate completed fertility (main effects of the variables)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Educational level								
Low	0.094***	0.094***	0.094***	0.094***	0.094***	0.094***	0.094***	0.094***
Middle (ref.)								
High	-0.041***	-0.041***	-0.041***	-0.040***	-0.041***	-0.040***	-0.041***	-0.041***
Family allowances		-0.002**						
Tax and benefits trans.			-0.000**					
Weighted leave weeks				0.002				
Child care enrollment					0.003			
Men working hours						-0.029*		
Women share part- time							0.002	
Gender egalitarian values								0.009***
Constant	-3.163***	-3.143***	-3.137***	-3.218***	-3.244***	-2.003***	-3.208***	-3.879***
Var(country)	0.013***	0.009***	0.008***	0.012***	0.011***	0.010***	0.012***	0.006***

Note: + p<0.10 * p<0.05 ** p<0.01 *** p<0.001

Table 3. Results of the regression models that estimate completed fertility, showing the interaction effects of education with the context-level variables

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Educational level							
Low	0.07658***	0.07428***	0 .12642***	0.12251***	-0.69959***	0.16258***	0.41312***
Middle							
High	-0.03248***	-0.03146***	-0.04858***	-0.10117***	0.31254*	-0.03429+	-0.25994***
Family allowances	-0.00182**						
Low X fa	0.00038***						
High X fa	-0.00070***						

Tax and benefits trans.		-0.00007**					
Low X tb		0.00001***					
High X tb		-0.00003***					
Weighted leave weeks			0. 00182				
Low X Wl			-0. 00115**				
High X Wl			0. 00023				
Child care enrollment				0.00229			
Low X ch.care				-0.00096+			
High X ch.care				0.00179***			
Men working hours					-0.03064*		
Low X m_hhw					0.01937***		
High X m_hhw					-0.00876*		
Women share part-time						0.00249	
Low X part						-0.00273***	
High X part						-0.00021	
Gender egalitarian values							0.00935***
Low X value							-0.00435***
High X value							0.00278***
Constant	-3.14042***	-3.13490***	-3.22441***	-3.23331***	-1.92308***	-3.23168***	-3.87877***
Var (country)	0.00847***	0.00793***	0 .01202***	0.01146***	0.01016***	0.01344***	0.00466***

Note: + p<0.10 * p<0.05 ** p<0.01 *** p<0.001

The effect of leaves is not significant in Table 2 (model 4). When the interaction with education is considered (Table 3 model 3), consistently with our expectations, the effect of leaves is increasing in the level of education. However, the effect for the reference category (0.00182) is not statistically significant while the differential effect of leaves for low educated women is statistically significantly lower than for medium educated women.

A similar pattern of results is found for childcare. Model 4 of Table 3 shows that the effect of childcare is positive for all education groups. However, again its effect is not statistically significant for medium educated women (0.00229), while the differential negative and positive effects for low and high educated women, respectively, are statistically significant.

Consistent with our expectations is the overall effect of men's working hours. Long hours have a clear negative impact on the number of children (Table 2, Model 6). While

a higher number of men's working hours affects negatively fertility for all education group, long men's workdays show the strongest negative effects for fertility for tertiary educated women (Table 3, Model 5).

The degree to which women have access to part-time jobs does not appear to have any major effect in general. But, once again, the effect differs across education levels: it is negative only for women with low levels of education.

And what is the influence of gender egalitarian norms in the population? Here, our main hypothesis finds some support: the more gender egalitarian attitudes are diffused in a country, the higher is fertility (Table 2, Model 8). Once more, the effect differs sharply by education (Table 3, Model 7). The effect of gender egalitarian attitudes is positive for all education groups, but is the strongest for women with high education, those who have the lowest probability to adhere to a traditional family model, and so to have the highest probability to gain from gender egalitarian attitudes.

Finally, we expected the effect of policies favoring the combination of work and parenthood to be stronger the more gender equal a society is, and vice versa for policies not directed at favoring gender equality. Table 4 shows that the only significant interaction between gender egalitarian values and the policy variables is found for family allowances. For low levels of gender equality, the effect of family allowances is positive. As gender equality increases, its effect decreases and in egalitarian societies it actually turns negative.

Table 4. Results of the regression models that estimate completed fertility, showing the interaction effects of gender values with the context-level variables

Model	(1)	(2)	(3)	(4)	(5)	(6)
Educational level						
Low	0.09475***	0.09443***	0.09448***	0.09439***	0.09445***	0.09474***
Middle (ref.)						
High	-0.04061***	-0.04074***	-0.04060***	-0.04060***	-0.04061***	-0.04060***
Family allowances	0.10838**					
Gender equality values	0.00757***	0.00780***	0.00804**	0.00997*	-0.05168	0.01400*

Fa X values	-0.00169**					
Tax and benefits tr.		0.00059				
Tb X values		-0.00001+				
Weighted leave weeks			0. 00078			
Wl X values			0.00000			
Child care enrollment				-0.00148		
C.care X values				0.00001		
Men working hours					-0.13330	
M_hhw X values					0.00149	
Women part time work						0.01698
Part_time X values						-0.00019
Constant	-3.70347***	-3.73411***	-3.86800***	-3.90222***	1.57039	-4.30871***
Var(country)	0.00306**	0.00432***	0.00590***	0.00359**	0.00616***	0.00550***

Note: + p<0.10 * p<0.05 ** p<0.01 *** p<0.001

9 Conclusions

What is the impact of public policies on fertility? In this paper we have approached this issue by focusing on policies that shape the gender system. A number of theoretical and empirical contributions point to the relevance of gender inequalities as a main factor explaining the low levels of fertility observed in most advanced societies. Thus, a critical element to be examined is the work-family reconciliation problem, in societies that are engaged in a transformation towards more egalitarian gender relations. Compared to most analyses, our policy focus has been more comprehensive and, furthermore, we do not frame the work-family conflict as an exclusively female issue. Moreover, we have also considered the influence of gender norms. Gender equity norms and the policy context may interact, potentially leading to stronger or weaker effects of policies, depending on the prevalence of gender egalitarian values in the population.

We cannot make any strong causal claims, but our findings do suggest that policies which support a gender egalitarian model have a positive effect on fertility. The expected direction of effects were found in all the variables considered, though not always the effects were statistically significant. For example, we find that shorter working days for men have a positive effect of fertility. But it is evident that policy effects differ markedly across education levels. Statistically significant interactions were found between education and all policy variables and gender norms. Finally, we find that policies directed at sustaining a traditional role for women, like family allowances,

may have a positive effect on fertility only in countries where gender egalitarian values have not yet spread.

References

Aassve, A., Billari, F., & Speder, Z., (2006). Societal transition, policy changes and family formation: Evidence from Hungary. *European Journal of Population*, 22(2), 127-152.

Ahn, N., & Mira, P., (2002). "A note on the changing relationship between fertility and female employment rates in developed countries." *Journal of Population Economics*, 15(4):667-82.

Andersson, G., (2000). The impact of labour-force participation on childbearing behaviour: pro-cyclical fertility in Sweden during the 1980s and 1990s. *European Journal of Population*, 16: 293-333.

Anxo, D., Flood, L., Mencarini, L., Pailhé, A., Solaz, A., & Tanturri, M. L. (2007). Time allocation between work and family over the life-cycle: A comparative gender analysis of Italy, France, Sweden and the United States. IZA discussion paper no. 3193, Bonn.

Arpino, B., & Tavares, L. P., (2013). Fertility and values in Italy and Spain: A look at regional differences within the European context. *Population Review*, 52(1), 62-86.

Baizán, P., (2009). Regional child care availability and fertility decisions in Spain. *Demographic Research*, 21, 803-842.

Bernhardt, E., (1993). Fertility and employment. *European Sociological Review*, 9(1): 25-42.

Bettio, F., & Plantenga, J., (2004). Comparing care regimes in Europe. *Feminist Economics*, 10(1): 85-113.

Billari, F. C., &. Kohler, H.-P., (2004). Patterns of low and lowest-low fertility in Europe. *Population Studies 58*(2), 161–176.

Bujard, M. (2011). Family policy and demographic effects: the case of Germany. *Demografia*, 54(5). English Edition, 56-78.

Balbo, N., Billari, F., & Mills, M., (2012). Fertility in advanced societies: A review of research. *European Journal of Population*, 1–38.

Bonoli, G., (2008). The impact of social policy on fertility: evidence from Switzerland, *Journal of European Social Policy*, 18(1), 64-77.

Bowles, S., (1998). Endogenous preferences: The cultural consequences of markets and other Economic institutions. *Journal of Economic Literature*, 36(1): 75-111.

Brewster, Karin L., & Ronald R. Rindfuss. (2000). Fertility and Women's Employment in Industrialized Nations. *Annual Review of Sociology*, 26:271-96.

Cameron, A.C., & Trivedi, P.K., (1998). *Regression analysis of count data*, Cambridge University Press.

Castles, F. G. (2003). The world turned upside down: Below replacement fertility, changing preferences and family-friendly public policies in 21 OECD-countries. *Journal of European Social Policy*, 13: 209-27.

Crompton, R., (1999). Discussions and conclusions. In Rosemary Crompton (ed). *Restructuring gender relations and employment: the decline of the male breadwinner*. Oxford: Oxford University Press.

Coltrane, S., (2000). Research on Household Labor: Modeling and Measuring the Social Embeddedness of Routine Family Work. *Journal of Marriage and the Family* 62 (November 2000): 1208–1233.

Engelhardt, H., & Prskwetz, A. (2004). "On the changing correlation between fertility and female employment over space and time". *European Journal of Population*, 20(1): 35-62.

Esping-Andersen, G. (1990). *The Three Worlds of Welfare Capitalism*. Cambridge: Polity.

Esping-Andersen, G. (1999). *Social Foundations of Postindustrial Economies*. New York: Oxford University Press.

Esping-Andersen, G. (2009). *The Incomplete Revolution: Adapting to Women's New Roles*. Cambridge, UK; Malden, USA: Polity Press.

Esping-Andersen, G. & Billari, F.C. (2013). *Re-theorizing Family Demographics.* Unpublished manuscript.

Gauthier, A.H. (2007). The impact of family policies on fertility in industrialized countries: a review of the literature. *Population Research and Policy Review*, 26, 323-346.

Gauthier, A.H. (2011). Comparative Family Policy Database, Version 3 [computer file]. Netherlands Interdisciplinary Demographic Institute and Max Planck Institute for Demographic Research (distributors). Retrieved from: www.demogr.mpg.de.

Gauthier, A. H., & Hatzius, J. (1997). Family benefits and fertility: An econometric analysis. *Population Studies*, 51, 295–306.

Gershuny, J. (2000). *Changing Times: Work and Leisure in Postindustrial Society*. Oxford: Oxford University Press.

Gornick, J.C., & Meyers, M. (2003). *Families that work: policies for reconciling parenthood and employment*. New York: Russell Sage Foundation.

Gustavsson, S. & Stafford, F. (1994). Three regimes of childcare: the United States, the Netherlands, and Sweden. In *Social Protection versus Economic Flexibility*, ed. R. Blank. Chicago: University of Chicago Press, pp. 333-362.

Hakim, C. (2000). *Work-lifestyle choices in the 21st century: preference theory*. Oxford: Oxford University Press.

Hantrais, L. (1994). Comparing family policies in Britain, France and Germany, *Journal of social policy*, 23(2), 135-160.

Hoem, J.M. (2008). The impact of public policies on European fertility, *Demographic Research*, 19(10), 249-260.

Hook, J. L. (2010). Gender Inequality in the Welfare State: Sex Segregation in Housework, 1965–2003. *American Journal of Sociology* 115(5)1480-1523.

Jakee, K. & Sun, G.-Z. (2001). Adaptive preferences and welfare state dynamics: A simple model. Max-Planck-Institute for Research into Economic Systems (Jena, Germany). Papers on Economics and Evolution, 2.

Kalwij, A. (2010). The impact of family policy expenditure on fertility in Western Europe. *Demography*, 47(2), 503–519.

Kögel, Tomas. (2004). Did the association between fertility and female employment within OECD countries really change its sign?. *Journal of Population Economic* 17:45-65.

Kan, M.Y., Sullivan, O. & Gershuny, J., (2011). Gender Convergence in Domestic Work: Discerning the Effects of Interactional and Institutional Barriers from Large-Scale Data. *Sociology* 45(2) 234–251.

Keck, W. & Saraceno, C. (2011). Comparative childcare statistics in Europe. Conceptual and methodological fallacies. Multilinks Insights No. 1. Berlin, Germany: Wissenschaftszentrum Berlin fur Sozialforschung.

Kravdal, O. & Rindfuss, R. R. (2008). Changing Relationships between Education and Fertility: A Study of Women and Men Born 1940 to 1964. *American Sociological Review*, 73: 854.

Lewis, J. (1992). Gender and the development of welfare regimes. *Journal of European Social Policy*, 2: 159–173.

Lewis, J. (1998). *Gender, Social Care and Welfare State Restructuring in Europe*. Aldershot: Ashgate.

McDonald, P. (2004) Gender equity in theories of fertility transition. *Population and Development Review*, 26 (3), 427–439.

Myrskyla, M., Billari F. C. & Kohler H-P. (2011). High development and fertility: fertility at older reproductive ages and gender equality explain the positive link. MPIDR Working Papers WP-2011-017, Max Planck Institute for Demographic Research, Rostock, Germany.

Neyer, G. & Andersson G. (2008). Consequences of Family Policies on Childbearing Behavior: Effects or Artifacts?. *Population and Development Review*, 34(4): 699–724.

Orloff, A. S. (1996). Gender in the Welfare State. *Annual Review of Sociology,* 22: 51-78.

Orloff, A. S. (2002).Women's Employment and Welfare Regimes Globalization, Export Orientation and Social Policy in Europe and North America. Social Policy and

Development Programme, Paper Number 12. Geneva: United Nations Research Institute for Social Development.

Pfau-Effinger, B. (2004). *Development of culture, welfare States and Women's Employment in Europe*. Aldershot: Ashgate.

Ray, R., Gornick, J.C. & Schmitt, J. (2010). Who cares? assessing generosity and gender equality in parental leave policy designs in 21 countries, *Journal of European Social Policy*, 20(3), 196-216.

Rindfuss, R.R., Guilkey, D., Philip Morgan, S., Kravdal, O. & Guzzo, K.B. (2007). Child Care Availability and First-Birth Timing in Norway. *Demography*, 44(2), 345-372.

Ronsen, M. (2004). Fertility and public policies—Evidence from Norway and Finland. *Demographic Research*, 10, 143–170.

Saraceno, C. (2010). Social inequalities in facing old-age dependency: a bi-generational perspective. *Journal of European Social Policy*, 20 (1), 32–44.

Saraceno, C. & Keck, W., (2009). The institutional framework of intergenerational family obligations in Europe: a conceptual and methodological overview. Report of the Multilinks Project.

Saraceno, C. & Keck, W. (2011). Towards an integrated approach for the analysis of gender equity in policies supporting paid work and care responsibilities. *Demographic Research*, 25(11) 471-306.

Shang, Q. & Weinberg, B.A. (2013). Opting for families: recent trends in the fertility of highly educated women. *Journal of Population Economics*, 26: 5-32.

Thévenon, O. (2011). Family Policies in OECD Countries: A Comparative Analysis. *Population and Development Review*, 37(1), 57–87.

Thévenon, O. & Luci, A. (2012). Reconciling Work, Family and Child Outcomes: What Implications for Family Support Policies?. *Population Research and Policy Review*, 31, 855–882.

Waldfogel, J., Han, W.-J., & Brooks-Gunn, J. (2002). The Effects of Early Maternal Employment on Child Development. *Demography*, 39(2): 39-392.

Wall, K. (2007). Leave policy models and the articulation of work and family in Europe. In: Moss, P. & Wall, K. (eds). *International Review of Leave Policies and Related Research*, Employment Relations Research Series No. 80. London: BERR, 25–43. Available at: http://www.leavenetwork.org/fileadmin/Leavenetwork/Annual_reviews/2007_annual_report.pdf