Family policies and fertility -
Examining the link between family policy institutions and fertility rates in 33 countries 1995-2010

Tommy Ferrarini
Swedish Institute for Social Research
Stockholm University

Katharina Wesolowski
Sociology/Baltic and East European Graduate School (BEEGS)
Södertörn University

Abstract In what ways are different family policies related to fertility? Previous studies on longstanding OECD-countries have come to rather mixed results based on family-policy expenditures or formal benefit rates. This study draws on new institutional family-policy data for a wider set of countries in a multidimensional analysis of the link between family-policy institutions and fertility change in 33 developed countries 1995 to 2010. Pooled time-series cross-section regressions show that more extensive gender-egalitarian family policies and female employment are linked to higher fertility, while policies supporting more traditional family patterns as well as the degree of economic development show no statistically significant results. Analyses of the interaction between earner-carer support and female paid work indicate that the impact of introducing more gender-egalitarian policies would be stronger in countries with lower levels of female labor force participation. Regressions with differenced data sustain ideas of earner-carer support being linked to total fertility increase.

Introduction

Over recent decades total fertility has remained below the replacement rate of 2.1 children per woman of fertile age in most affluent countries, causing concerns among policymakers as well as scholars about ways to revert, or at least slow down, such developments. Family-policy legislation has here entered the searchlight. In research on welfare states and family change a much debated issue concerns the extent to which family policies at all impact on fertility, and empirical evidence has at times been inconclusive. There may be several reasons for this. One reason is that previous comparative studies in this area often have been restricted to analyses of longstanding OECD-member countries from the 1970s to the early 1990s (Neyer and Andersson, 2008). Another reason is that analyses often have had to be confined to less precise data on formal replacement rates, or family-policy expenditures, making it difficult to evaluate the role of different orientations of family-policy legislation.

This paper aims to add new knowledge to this debate by analyzing the link between different family-policy institutions and fertility rates between 1995 and 2010 in 33 countries using pooled time-series cross-section regression. Our study contributes to the debate about links between family policy and childbearing by extending analyses of recent family-policy development and fertility from the longstanding OECD-member countries to also include post-communist countries in Eastern Europe, where fertility decline often has been substantial. We also exclusively use new systematically comparative rule-based data on family-policy transfers, enabling us to evaluate the role of two central policy dimensions for fertility: earner-carer support, sustaining more gender-egalitarian divisions of paid and unpaid work, and traditional-family support, which upholds gendered divisions of work to a higher degree (see Korpi, 2000; Korpi et al., 2013). The implications of family policies for childbearing cannot be properly addressed without considering the role of gender inequalities, because different policy orientations influence the gendered division of care work and employment in different ways.

The development of institutional social-policy data has emanated from well-known validity problems with expenditure data in analyses of the causes and consequences of welfare states (see Bolzendahl, 2011; Esping-Andersen, 1990; Gilbert, 2009; Goodin et al., 1999; Kangas and Palme, 2007). Even if expenditure data have contributed important insights they are often at an insufficiently detailed level to separate theoretically central institutional characteristics of policies. Just to give one telling example, an earnings-related parental leave

benefit with shorter duration and a flat-rate parental leave benefit with longer duration may have similar expenditures but completely opposite effects on the gendered distribution of paid and unpaid work, which in turn may be important for fertility decisions. Institutional data are less affected than are expenditure data by the welfare state outcomes that are subject to study (e.g. the number of children when analyzing links between family policy and fertility) and changes in the gross domestic product (GDP), the most widely used denominator when analyzing expenditures. Moreover, tax claw-backs of benefits are typically not considered in expenditure data, making comparisons between taxable and non-taxable benefits flawed.

There are several pathways through which family-policy institutions can be linked to childbearing. We may expect that policies impact on childbearing behavior by directly increasing the size of household budgets, thus decreasing the household costs of children. A positive link could here in general be hypothesized between the extent of different policies and total fertility. However, family policies are also likely to have indirect effects on behavior, not least concerning women's possibilities to combine paid work and childbearing. In this context it becomes crucial to consider women's employment, where the two types of policies are likely to have divergent effects. Earner-carer support, assisting the combination of paid work and care, is in particular likely to increase female labor force participation, both before and after childbirth. It is also relevant to analyze the impact of economic development, because we could theoretically expect GDP to impact on childbearing.

The following section of our study discusses results from previous studies analyzing links between family policy and fertility. The third section is devoted to data and methodological issues. The fourth section presents empirical evidence, and the final section discusses our main results.

Family policy and fertility – previous research

In what ways can family policy be expected to influence fertility change in developed countries? The explanations for the long-term fertility change are several. General rises in incomes, increases in women's labor force participation and education were for long assumed to introduce a trade-off between the number of children and the investment in the child's education, and women's increasing educational attainment and earnings implied that they would be more prone to choose paid work over childbearing (Barro and Becker, 1989; Blossfeld, 1995). However, the link between economic development and female employment

on the one hand and fertility on the other appears to have turned from a clearly negative correlation in the 1970s and the 1980s to a positive one during most recent decades. One main reason why female employment and economic development now is positively related to fertility has been sought in the ways family policies actively can assist the combination of paid work and family life (Ahn and Mira, 2002; d´Addio and d´Ercole, 2005; Thévenon, 2011).

It has been pointed out that countries, where family policies specifically are designed to support reconciliation of paid work and family life, are the ones that have managed best to counter fertility decline (Castles, 2004; Ferrarini, 2003). Economic development may well be a reason for the "fertility-rebound" observed in rich countries (Myrskylä et al., 2009), but it has in this context also been argued that female employment may be the key factor behind such processes (Luci-Greulich and Thévenon, 2013).

Nevertheless, diverging views exist on the extent that family-policy measures actually may influence fertility. Evidence from comparative macro-level analyses supports the idea that family policies may influence fertility (Blanchet and Ekert-Jaffé, 1994; Castles, 2003; Gauthier and Hatzius, 1997; Rovny, 2011; Ruhm and Teague, 1995; Winegarden and Bracy, 1995). In a review of previous findings, Gauthier comes to the conclusion that there is evidence supporting the argument that family policies actually may increase fertility even though effects appear to be rather small. However, empirical findings have at times been contradictory, partly due to lack of available data on different types of public family policies (Gauthier, 2007).

McDonald (2006) argues that policies facilitating the reconciliation of paid work and child-raising would be the most viable way to raise fertility and also discusses that already small impacts could raise the total fertility rate (TFR) above lowest-low fertility levels. A recent study by Luci-Greulich and Thévenon (2013) on family policy in 18 longstanding OECD countries in the period 1982-2007 demonstrates that family policies may increase fertility rates. Different family-policy measures were analyzed and the results indicate that each policy instrument has a positive effect although their influence differs depending on the family-policy context in each country. One conclusion the authors draw is that a combination of different family policies facilitates childbirth, however without going into detail which particular type of combination would be the most favorable.

Neyer and Andersson (2008) conclude that studies on family policies and their probable impact on fertility mostly have concentrated on longstanding OECD countries and

past time periods. The study of Luci-Greulich and Thévenon (2013) is one of the first studies to include family policy data that stretches into the most recent decade. However, their study does not cover Eastern European countries. Several researchers have discussed the tendency of changes of family policies towards a more familialist or male-breadwinner model in post-communist countries (Ciccia and Verloo, 2012; Saxonberg and Szelewa, 2007), but the development of family policies in these contexts has also been shown to be quite diverse, not only oriented towards a re-familialization but in several instances also emphasizing more gender equality (Aidukaite, 2006; Billingsley and Ferrarini, 2014).

Much of the discussions about recent fertility change points to the potential role that can be played by family policy. As discussed above, family policies may in several ways impact on fertility as well as on the potentially important intermediate factor female employment. One obvious direct effect of family-policy transfers is that they increase the size of the household budget and thus lower the financial costs of children (costs for household goods, education, housing etc.). It is important to note that family-policy transfers and services, however, also may have important indirect effects on childbearing decisions, either by supporting paid work (and care) of both parents or by sustaining higher gendered divisions of labor, where women's main responsibility for care work is traded against less involvement in paid work (Korpi, 2000; Sainsbury, 1996).

The theoretical perspective used in the present study is multi-dimensional and draws on the work by Korpi (2000), recognizing the institutional complexity of legislated family policies. The two dimensions of family policy we use have been argued to be the most relevant to gender-related behaviors: traditional-family support, which sustains a gendered division of labor, and support to earner-carer families, where the parents´ role as both earner and carer is supported. These dimensions are constituted by sets of family policies, which recognize that single policies may function as alternatives or complements in the broader orientation of family policy (Korpi et al., 2013). Moreover, this perspective also allows countries to have contradictory elements in their family policy – meaning that both gender-egalitarian and traditionalist policies could be highly developed. Such policy constellations have often been shaped by class and gender interest formation, changing political power relations, and policy inertia producing a particular layering of different family policies with contradictory elements (Ferrarini, 2006).

To measure the policy dimensions we need to have rule-based institutional and comparative indicators on family policy. In the following section we discuss such indicators and their theoretical and methodological underpinnings.

Data and methodological considerations

As mentioned in the introduction, the development of institutional social-policy data emanated from the challenge posed by validity problems associated with expenditure data in welfare-state analyses, with major difficulties to separate legislative structures from welfare needs in a more detailed way and sensitivity to changes in the GDP-measures used as denominator when constructing indicators. The common alternative use of welfare state regime classifications in analyses of demographic outcomes to measure economic and institutional effects is linked to yet other validity problems. While welfare state regimes certainly are useful as heuristic devices in descriptive analysis they are much less suitable to address questions about policy effects, not least because welfare state regime labels are insensitive to change and do not account for differences between countries grouped in the same regime.

Even if data on family-policy expenditures have improved, and several recent studies here have provided interesting empirical results (Kalwij, 2010; Luci and Thévenon, 2010), it is for the above stated reasons highly warranted to aim for an analytical separation of theoretically important institutional dimensions of family-policy legislation by use of rule-based indicators.

Institutional analyses of family policy are not entirely new to analyses of fertility outcomes, and several studies have for example used formal legislated replacement rates in per cent (Castles, 2003; Gauthier and Hatzius, 1997). Although such analyses also have made a considerable contribution to the comparative welfare-state literature, there are some major drawbacks with the use of formally legislated rates. First, as taxation of benefits is not considered, bias is introduced in the comparison between taxable and non-taxable benefits. Second, legislated benefit ceilings are not taken into account which means that benefits with seemingly high formal replacement rates may have factual replacement levels that are considerably lower because earnings-ceilings of benefits often are set at a fairly low income.

To address the above-mentioned problems, our core independent variables are the net replacement rates of family benefits, which calculate the size of benefits after income

taxation in proportion of an average production worker's after-tax wage. Data for the countries included in the analyses are mainly taken from the Social Citizenship Indicator Program (SCIP) and the Social Policy Indicator database (SPIN), developed at Stockholm University, covering 31 countries every fifth year 1995 to 2010.[1] We have further calculated comparable data for Russia and Ukraine, thus extending the number of analyzed countries to 33. This replacement-rate data is based on model-family estimation techniques, where entitlements for stylized households are calculated based on national legislation. Benefits are the yearly after-tax replacement rates for a family with two adults (one working full-time and one on leave) and two children (of which one infant) expressed in per cent of an average net production worker´s wage.

(Table 1)

Table 1 shows the two dimensions of family support and their respective constituting family-policy aspects. The traditional-family dimension is measured by a set of benefits that typically are not related to previous work-record and are paid in low flat-rate amounts or as lump-sum payments: child benefits paid in cash and via the tax system, tax deductions for a main earner with an economically inactive (or less active) spouse (marriage subsidies), childcare leave allowances which in many European countries are paid in low flat-rate amounts for extended leave, and lump-sum maternity grants that are paid in connection to childbirth. The earner-carer dimension is measured by earnings-related post-natal leave benefits paid to mothers and fathers, in per cent of an average production worker's after-tax wage. To capture the degree of earnings-relatedness the parent on leave is assumed to have worked two years previous to childbirth, earning an average wage, before spending a leave period with the infant.

The availability of public daycare is another factor that is likely to be central for childbearing decisions. However, as welfare-state analysts for long have been aware of, comparative institutional data on public daycare that are longitudinal are difficult to find, and for the Eastern European countries it is even hard to come by valid cross-sectional such data.

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[1] The following countries are included: Australia, Austria , Belgium, Bulgaria, Canada, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Latvia, Lithuania, the Netherlands, New Zealand, Norway, Poland, Portugal, Romania, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, the United Kingdom and the United States.

Nevertheless, it should be pointed out that previous studies of developed welfare states have shown that earnings-related parental leave benefits and the extent of public childcare for the youngest children are highly correlated, because these policies have often have developed in tandem, pushed by similar driving forces. Rule-based indicators based on family-policy transfers may here thus to great degree function as proxies for the main orientation of the family-policy matrix (Ferrarini, 2006).

(Table 2)

Table 2 shows the regression variables and their respective mean values and standard deviations. The total fertility rate (TFR) is the outcome variable employed in our analyses. This measure is the sum of age-specific fertility rates for a given year, and it indicates the number of live births a woman would have if she throughout her reproductive period would experience the age-specific fertility rates of the observation year. Earner-carer support (Earner-Carer) and traditional-family support (Traditional) are our main explanatory variables. Female labor force participation (Femlab) is the share of women aged 15 to 64 in the labor force of a country. Unemployment is measured in per cent unemployed in the labor force. Gross Domestic Product (GDP) data are from the World Bank, measured in per capita gross domestic product converted to US dollars using purchasing power parity (PPP) rates.

We regress total fertility rates on the two policy dimensions (traditional-family and earner-carer support), also including the above-mentioned important explanatory factors: female labor force participation, GDP and unemployment rates. Because the number of countries substantially exceeds the number of time points, certain analytical restrictions have to be considered. Errors from OLS-regression equations on pooled data have among other things been shown to be temporally autoregressive, cross-sectionally heteroskedastic and cross-sectionally correlated (Hicks, 1994). Under such circumstances, standard errors are likely to be severely underestimated. We will therefore estimate models with panel-corrected standard errors (see Beck and Katz, 1995).

Our main models are estimated with country-fixed effects and corrections for first-order auto-regressiveness which have been performed in similar analyses with relatively few time points (see Huber and Stephens, 2000). However, as our total sample is restricted due to the availability of observations for which we have comparative rule-based data we will also

carry out alternative specifications to test the robustness of our results. In particular, we will also estimate change-models based on differenced data, where change in policy is related to change in TFR. Differencing generally produces more conservative estimates on links between independent variables and outcomes, but it should be pointed out that our use of first differences also reduces the sample size with one temporal point.

Empirical evidence

In this section we begin presenting empirical evidence from our pooled time-series cross-sectional regressions. Regression table 1 introduces a series of stepwise pooled regression models, each including country-fixed effects (not reported in table). Model 1-3 includes the two types of family support separately first and then together. These regressions show that earner-carer support has a positive and statistically significant link to TFR, traditional-family support does not come out with a statistically significant correlation. Model 4 also introduces female labor force participation alongside the two policy variables, and shows that both earner-carer support and female labor force participation are positively and significantly linked to TFR. The coefficient for earner-carer support is slightly weakened as compared to Model 3, which is in line with ideas that some of the impacts of such policies are mediated through higher female employment, as they explicitly support female employment.

(Regression table 1)

Model 5 introduces a multiplicative interaction term between female labor force participation and earner-carer support. Independent significant correlations are still shown between the two respective variables constituting the interaction and TFR, while the interaction term shows a negative and statistically significant correlation. Given that interaction terms often are difficult to straightforwardly interpret we will shortly return to further analysis and interpretation of this result. Model 6 also includes unemployment levels and GDP, of which the latter variable shows the positive correlation reported in earlier studies (see Luci and Thévenon, 2010), but it is non-significant. It could be suspected that the reason for the non-effect of GDP is to be found in the inclusion of Eastern European countries, which report lower GDP-levels than longstanding OECD-member countries. However, it can be noted that the

removal of the latter group of countries from analysis does not alter the main results (not shown in table).

(Figure 1)

To facilitate interpretation of the interaction effect introduced in Model 5, Figure 1 graphically illustrates the predicted TFR at different levels of earner-carer support and at different levels of female employment. We have here used the observed range of female labor force participation, and each line indicates different levels of earner-carer support (20, 40, 60 and 80 per cent, respectively). The negative interaction term from Regression table 1 is manifested in the decreasing slope of higher earner-carer support at higher levels of female employment. At the highest levels of female labor force participation it appears as if more extensive earner-carer support would decrease TFR. However, the differences between slopes are only statistically significant for female labor force participation rates below 70 per cent (not shown). To put it in other words, results lend support to the idea that there is a positive effect of earner-carer support on total fertility, but with decreasing returns from earner-carer support with rising female employment.

(Regression table 2)

Regression table 2 shows results from a series of alternative regression analyses of first differences. Each independent variable is here at first introduced stepwise. All independent variables have the expected directions, but earner-carer support is the only explanatory variable which is statistically significant. Simultaneously introducing a full model, controlling for all the independent variables, in Model 6 does not alter this result. Using this more conservative estimation technique thus suggests that changes in gender-egalitarian policies can be linked to changes in fertility rates. The fact that one time point is lost by differencing renders results not strictly comparable to the results of the pooled time-series cross-sectional analyses in Regression table 1, and non-significant variables could possibly reach statistical significance with an extended sample.

Discussion

Can family policy institutions be expected to influence fertility change in developed countries? The results from our study lend affirmative evidence to this question. Using new institutional data and performing pooled time-series cross-section regressions we investigate the link between family-policy institutions and changing fertility in 33 countries. We find that different family-policy orientations have different relationships to fertility and that an important part of the puzzle lies in whether policies support more gender-egalitarian behaviors or not. More gender-egalitarian family policies are correlated with higher fertility, while policies supporting traditional family patterns show no statistically significant results. Female employment also has positive links with fertility. Gender-egalitarian family policies here in particular appear to impact on fertility through increasing female labor force participation.

When we analyze the interaction between earner-carer support and female paid work we are able to show that the introduction of more gender-egalitarian policies would be stronger in countries that have lower levels of female labor force participation. GDP does not come out with a statistically significant relationship with fertility, albeit being positive. Our results are in line with the arguments made by Luci-Greulich and Thévenon (2013) that female labor force participation may be more important than the degree of economic development for recent decades' changes in fertility, and that family-policy legislation could play a major role in this development. Regressions with differenced data also support ideas that changes in earner-carer support are linked to increases in total fertility.

Interesting to note is also that tendencies manifested in earlier studies on Western countries (see Castles, 2004; Ferrarini, 2006) hold when former communist countries are included in the analyses. Already in previous studies it has been concluded that a multidimensional perspective on family policy appears to be a fruitful way of analyzing family policies in both Western and Eastern European countries (Ferrarini and Sjöberg, 2010), although fertility has not been directly discussed. It can in this context be put up to question whether trends towards expanding gender-traditional family policies – in for example Russia and Ukraine instated with explicit pro-natalist aims – at all will be an effective way to raise fertility levels.

The results of our study give more weight to the arguments by McDonald (2006) that it is policies that assist in combining paid work and childraising, e.g. more gender-egalitarian oriented family policies, that are connected with higher fertility levels. On the other hand,

taking the decreasing returns of gender-egalitarian family policies at higher levels of female labor force participation into account, the effect on fertility levels of introducing more gender-egalitarian family policies in post-communist countries could possibly differ depending on the level of female labor force participation in the respective country.

Our study has been concentrated to cash and fiscal family-policy transfers. But the results are probably not only confined to this set of policies, as it previously has been shown that family-policy transfers to some extent also function as proxies for the broader family-policy matrix. In particular, countries where transfers support more gender-egalitarian divisions of paid and unpaid work also tend to have highly developed public daycare for the youngest children. Nevertheless, in future analyses we need to explicitly bring in the institutional structure of public childcare and probably also elder care into our analyses. Broadly comparative data on public services that is longitudinal and covers a greater number of countries is still severely lacking. However, it is likely that a multidimensional institutional framework could be fruitfully used with information on other parts of family-policy legislation – including not only family-policy services but also other pieces of family law, such as joint-custody legislation – in the evaluation of central socioeconomic and demographic outcomes.

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Table 1 Family-policy dimensions and included family-policy transfers

Family-policy dimension	Type of benefit
Earner-carer support	Maternity leave insurance
	Dual parental leave insurance
	Paternity leave insurance
Traditional-family support	Childcare leave
	Maternity grants
	Cash and fiscal child allowances
	Marriage subsidies

Note: all benefits are measured after taxes in per cent of an average production worker´s wage. Earner-carer support is the sum of the first year's post natal earnings-related leave benefits. Traditional-family support are the yearly amounts of flat-rate or lump sum family benefits.

**Table 2** Regression variables, mean and standard deviation for 33 countries, 1995-2010

Variable	Definition	Mean	Std. Dev
TFR	Total fertility rate	1.54	0.260
Earner-carer	Earner-carer support	38.34	30.14
Traditional	Traditional-family support	20.15	11.31
Femlab	Female labor force participation	64.35	7.36
Unemployment	Unemployment rate	8.76	4.20
GDP	Gross Domestic Product, per capita, PPP-converted US dollars	16,221.53	7,092.98

REGRESSION TABLE 1. Pooled time-series cross-section regression of fertility rates on different determinants in 33 countries 1995-2010 with country fixed effects (N=132). Prais-Winsten regression, correlated panels corrected standard errors (PCSEs).

TFR	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Earner-Carer	0.001***		0.001***	0.0006**	0.009*	0.009*
	(0.0001)		(0.0002)	(0.0002)	(0.004)	(0.004)
Traditional		0.001	0.001	0.001	0.0008	0.0001
		(0.002)	(0.001)	(0.001)	(0.001)	(0.0009)
Femlab				0.010***	0.015***	0.010**
				(0.002)	(0.003)	(0.004)
Femlab x Earner-Carer (Interaction term)					-0.0001*	-0.0001*
					(0.00006)	(0.00006)
Unemployment						-0.001
						(0.003)
GDP						4.49e-06
						(3.87e-06)
Constant	1.260***	1.235***	1.217***	0.589***	0.316	0.613**
	(0.061)	(0.084)	(0.080)	(0.165)	(0.184)	(0.191)
Common rho	-0.136	-0.122	-0.139	-0.156	-0.159	-0.143

Country fixed effects not shown, panel-corrected standard errors in parentheses, *p<0.05, **p<0.01, ***p<0.001

FIGURE 1. Predictive probabilities TFR at different levels of female labor force participation and replacement rates of earner-carer support. (Based on model 4, Regression table 1)

Predictive Margins
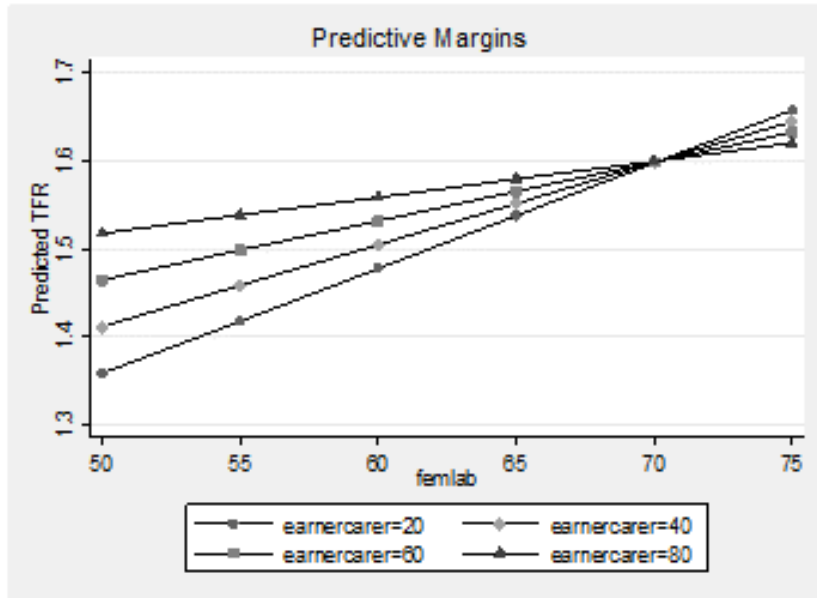
REGRESSION TABLE 2. Pooled time-series cross-section regression of fertility rates on different determinants in 33 countries 1995-2010, with differenced data (N=99). Prais-Winsten regression, correlated panels corrected standard errors (PCSEs).

Δ TFR	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Δ Earner-Carer	0.0008**					0.0008**
	(0.0003)					(0.0003)
Δ Traditional		0.0005				0.002
		(0.002)				(0.003)
Δ Femlab			0.008			0.006
			(0.005)			(0.005)
Δ GDP				5.30E-06		-2.92E-06
				(8.53E-06)		(1.56E-05)
Δ Unemployment					-0.002	-0.008
					(-0.004)	(0.148)
Constant	0.029	0.032	0.010	0.033	0.021	-0.003
	(0.036)	(0.035)	(0.058)	(0.038)	(0.040)	(0.148)
Common rho	0.054	0.018	-0.077	0.046	0.034	-0.362

Country fixed effects in model 6 not shown, panel-corrected standard errors in parentheses, *p<0.05, **p<0.01, ***p<0.001