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Peter Schwarz

Landau in der Pfalz, Germany

Abstract

This paper analyses whether favourable taxation of married couples distorts women's employment decisions. In contrast to previous research concentrating on experiences in a single country, this paper investigates cross-country differences in female labour force participation. The paper shows that, for a panel of Organisation for Economic Co-operation and Development (OECD) countries during the period 1979–2002, distortions with respect to the taxation of single and married persons can account partly for differences in female labour market participation across countries. However, we find also strong evidence that unfavourable market conditions due to high unemployment as well as few income opportunities have a deterring effect on female labour force participation, indicating that the decision to work is also driven by market forces. With respect to different countries the results suggest that especially in Ireland and the UK tax distortions have played a crucial role in distorting incentives to work.

Keywords

female employment, separate taxation, split taxation, tax disincentives, welfare states

Despite an increase in female labour force participation over time, substantial variation continues to exist across countries. Though social scientists disagree on the relative importance of the factors promoting female work, there is consensus that these differences can be at least partly explained by a combination of governmental policies towards families and married couples, employment regulations and different cultural patterns towards female work. While some researchers stress the importance of governmental policies such as child care or parental leave schemes (Crompton, 2006; Daly, 2011; European Commission's Expert Group on Gender and Employment Issues, 2009; Rubery et al., 2001:

65–6), others focus on the gender wage gap across countries, increasing income risks (or at least perceived risks) and differences in educational systems (Rubery et al., 2001: 47–8), and yet others attribute female employment to the spread of ideas towards more gender equity, implicating a shift in preferences (Castles, 2003).

Although all these explanations are valid, each allows for a large variation in how women enter the

Corresponding author:

Peter Schwarz, Drosselweg 36, 76829 Landau in der Pfalz, Germany

Email: schwarz10de@yahoo.de

labour market. Lewis (2001), for example, notes that the replacement of the male breadwinner model allows for different patterns of (paid) work arrangements ranging from short part-time to part-time and dual-career models. All these alternatives generally increase women's choice in allocating their time to paid or unpaid work. In some cases though, these models may induce new constraints, for example, by cutting lone mothers' eligibility for stay-at-home support (Daly, 2011). Besides equity considerations one of the driving forces of governmental policies towards increasing female employment rate is the growing dependency ratio (Rubery et al., 2001).

While numerous studies on childcare or maternity benefits exist, another important policy instrument – the taxation of married couples as well as tax concessions towards dependent children – has not gained much interest from sociologists. Notable exceptions in this under-researched area are the studies by Montanari (2000) and Dingeldey (2001). Whereas Montanari (2000) focuses on the nexus between party ideology on the level of the marriage subsidy and reliance on child tax benefits, Dingeldey (2001) concludes that taxation plays a crucial role in explaining women's working behaviour – at least in combination with other instruments of family policy. In addition, Castles (1998) notes that Catholicism, which might proxy among other things preferential taxation of one-income earner families, is an important factor in explaining female labour force participation. Thus, empirical research on the labour market effects of different tax systems did not receive much attention. Previous quantitative research, mainly in economics, instead concentrated on experiences in a single country or a small subset of Organisation for Economic Co-operation and Development (OECD) countries (for example, Gustafsson, 1992; Gutierrez-Domenech, 2005; LaLumia, 2008; Smith et al., 2003).

Moreover, taxation is an interesting topic because some countries have switched from a joint (or income-splitting) system towards a more neutral tax system in the 1970s and 1980s. For example, Italy abolished joint filing in 1977 and the UK switched to a system of separate taxation in the beginning of the 1990s (Pechman and Engelhardt, 1990: 9). However, other countries, for example, Ireland, France and

Germany, still tax married couples less heavily than single individuals (Dingeldey, 2001; O'Donoghue and Sutherland, 1998). The paper tests in a novel way whether some tax systems distort female labour force participation. In doing so it uses data across a wide range of OECD countries.

The paper is structured as follows: the next section introduces the four ideal types of tax systems for married couples, discusses the effects of tax concessions towards children and summarizes the results of previous empirical research. Thereafter, we formulate the hypotheses and explain the methodology and the data used in the empirical analysis. The final section briefly concludes.

Preferential taxation of families

Taxes distort labour supply because they place a wedge between an individual's gross and net income and favour leisure over work as long as the substitution effect dominates the income effect. While nowadays more men engage in child caring and social policies have been introduced to promote gender equality, for example, through providing bonuses to families in which the father also applies for parental leave (Daly, 2011: 12), the distribution of family-related tasks is still unequal. Therefore, Becker's (1965, 1985) proposition that women do not simply choose between the alternatives of leisure and work is still valid – at least at the margin, as Castles (2003) notes. This third option, namely, caring as well as household work, becomes especially important if the household has dependent children. Whereas women are more likely to adjust their labour market participation as a result of these tasks, this does not imply that full specialization occurs. Especially if childcare facilities are available, it becomes more likely that part-time work will be chosen. In addition, increasing divorce rates in the past make full specialization to unpaid work more risky (Dingeldey, 2001).

Tax incentives for children, as well as how couples are taxed, play a crucial role in determining whether women join the labour market or specialize (to some extent) in family-related work at home. Most OECD countries offer tax concessions towards families with children. Generally, tax concessions

towards families can take two different forms: first, some countries consider the costs of children by granting a child tax allowance towards families. This allowance reduces the taxable income of the household. An alternative way instead is to use tax credits, which reduce the tax liability of the parents directly. Independent of the form in which tax concessions are implemented in a countries' tax system, tax concessions towards children may indirectly affect the labour supply decision of women because they favour higher fertility rates and – through this channel – more reliance on home production of the second earner. Thus, in countries with more generous tax concessions towards children, fewer women should be (full-time) employed. However, this view might be questioned based on recent empirical evidence. Del Boca and Locatelli (2006) as well as Castles (2003) show that, for the major OECD countries, the relationship between fertility rates and female labour market participation has the expected negative relationship in the 1960s and 1970s, whereas the relationship reverses in recent years, indicating a complementary relationship between fertility and labour market participation. But even for the 1980s and 1990s the evidence remains inconclusive, since other studies (Genre et al., 2005; Iversen and Rosenbluth, 2006) found that the traditional negative relationship between fertility and female labour market participation still holds. One reason for the different results may be that the latter studies control for family expenditures, including parental leave and daycare for children, or the size of the public sector, which is an important employer of women.

Disincentive effects are not only present in the case where there are children. Even in the absence of children, the income of the second wage earner is taxed more heavily in many countries. Correspondingly, this means that the effective tax rate of the primary wage earner is lower compared with the case of a single person. Regarding the taxation of married couples we can differentiate four ideal types of tax systems. The disincentive effects are normally highest under a joint or split taxation scheme, somewhat lower under separate taxation schemes allowing for transfers between the couple, and fully absent under a pure system of separate

taxation. Algebraically, these ideal types can be expressed as follows:

Separate taxation:

$$T(Y_1; Y_2) = t(Y_1 - b) + t(Y_2 - b) \quad (1)$$

Separate taxation with transfer opportunity:

$$T(Y_1; Y_2) = t(Y_1 - b - Tr) + t(Y_2 - b + Tr) \quad (2)$$

Split taxation:

$$T(Y_1; Y_2) = 2 \times t \left[\frac{Y_1 + Y_2 - 2b}{2} \right] \quad (3)$$

Joint taxation:

$$T(Y_1; Y_2) = t^{\text{joint}}(Y_1 + Y_2 - 2b) \quad (4)$$

where T is the (joint) tax liability of the couple, b is the basic allowance, Tr is an amount of the household income which can be transferred between the couple and t is the (progressive) income tax function. For example, the couple's tax liability in a separate taxation system is a function of the two individual incomes Y_1 and Y_2 . Income tax is determined by subtracting the basic allowance for both incomes and then applying the progressive tax function on these incomes. If opportunities exist to transfer money between a couple, disincentive effects grow because an amount Tr can be shifted to minimize tax payments (equation 2). Disincentives become even larger in a split taxation system because the incomes Y_1 and Y_2 less the basic allowances are pooled together and then halved. Then the standard (progressive) income function is applied to each of the half incomes. Whenever the incomes Y_1 and Y_2 differ, the splitting effect emerges. It is (normally) largest when one partner has no earned income. Note that a separate taxation scheme with transfer opportunity replicates a split taxation system if the relationship $Tr \geq \frac{Y_1 - Y_2}{2}$ holds. In this special case the disincentive effects are as large as under a split taxation system. In some countries, the split taxation system is even enlarged towards a family-splitting system where total household income is divided by a

factor larger than 2 where there are children. In France, for example, the first two children get a weight of 0.5 and the third of 1.0. Thus, the taxable income of a family with three children is derived by dividing total household income four times and applying the tax function four times. Finally, a joint taxation system is also more likely than separate taxation to induce distortions on female labour force participation.

The equations show that only separate taxation guarantees the absence of disincentive effects because only then are both household members taxed like single individuals. Thus, the tax burden of a married couple is identical to the tax burden of two single individuals with identical pre-tax income. A marriage subsidy does not exist in this case.

Note, however, that only where a progressive income tax is applied the other ideal types favour the traditional breadwinner model. Thus, for any given tax system (with the exception of separate taxation) the value of the marriage subsidy increases with the progressivity of the tax system. For example, under a flat rate tax an income-splitting system would simply replicate a system of separate taxation. However, all OECD countries have a progressive income tax.

In sum, only a system of separate taxation does not distort the employment decision of the second wage earner, disincentive effects grow under a system of separate taxation with transfer opportunity and are highest under joint/split taxation systems.

Previous studies on the tax distortions on married couples focused to a large extent on the experiences in single countries (for Germany, Bergs et al., 2007, and for the US, LaLumia, 2008). Comparisons across countries are the early study by Gustafsson (1992), and those by Smith et al. (2003) and Gutierrez-Domenech (2005). Gustafsson (1992) shows that the different participation ratios of women in the Swedish and German labour market can be explained by the disincentive effects of the German tax system, whereas in Sweden a system of separate taxation is applied. Smith et al. (2003) study the labour supply of women in the UK, Denmark, Germany and Ireland. Conditional that a woman participates in the labour market, the authors analyse the decision to work part time or full time. They show that especially in countries where the labour supply decision of women is distorted by the tax system,

that is, Ireland and Germany, women participate less often in the labour market, especially if the household (after tax) income from a purely breadwinner model is high.

At the macro level Gutierrez-Domenech (2005) analyses post-birth employment of women in five OECD countries during the time span 1982–93. Her dummy variable on the countries' tax system is highly significant and indicates that in joint taxation systems women return less often into the labour market compared with countries operating under a separate taxation system. The only study using panel data across a wide range of OECD countries during the period 1985–99 is from Jaumotte (2003). Her measure of tax distortions – the relative tax burden of a single individual compared with a married couple – indicates that a 1 percent increase in the relative tax rate induces a reduction of the female labour force participation ratio between 0.2 and 0.3 percent. Therefore, tax disincentives also seem to explain female labour force participation rates on the macro level.

Tax distortion indicators

As the last section has shown, the tax system may distort the labour supply decision of women whenever the tax bill of married couples with identical pre-tax income is lower compared with a single individual. In reality even tax systems following the principle of separate taxation supply some incentives towards families and married couples. However, in some countries these incentives are more generous, thus distorting the labour supply decision of women to a larger extent. The data on tax distortions come from the OECD publication *Taxing Wages* and ranges back to 1979 (Organisation for Economic Co-operation and Development, 2008). Data are published for a single individual as well as for a married couple with two children earning an average income of which – in the case of the couple – the husband earns the whole household income. Thus, the case of the married couple refers to the traditional breadwinner model. Both measures do not solely disentangle the effects of marriage on the tax burden, since the scenario assumes that the married couple has two children who may be eligible

for special tax allowances (or tax credits). Thus a comparison of these two series shows the distortions induced by the government in comparison to a single individual on a more general level, including distortions by more favourable taxation of (married) couples as well as tax concessions towards children. Analysing the tax advantages requires that both household types earn an identical pre-tax income. Unfortunately, data are only available for average incomes. Thus, due to a lack of data it is not possible to measure the distortions on low-income or very wealthy households. We also consider – beside paid taxes – the social security contributions paid by the employee. In some countries, for example Germany or Austria, social security contributions play an important role in determining net household income. Social security contributions may also distort the labour supply decision because contributions may depend on the marital status of the individual. We therefore follow most previous empirical studies and use the burden on income taxes and employees' social security contributions (de Haan et al., 2004; Genre et al., 2005; Smith et al., 2003).¹

The tax data provided by the OECD *Taxing Wages* study (Organisation for Economic Co-operation and Development, 2008) is an average tax rate. Average tax rates are important, especially for participation decisions, whereas marginal tax rates refer to the case where a person extends his/her working hours by a small amount. Average tax rates are, for our research question, better suited because we want to explain the participation decision of women. However, as de Haan et al. (2004) have shown, marginal and average tax rates on labour income are highly correlated, leaving the question about the 'right' tax rate as a theoretical exercise.

We measure the distortions introduced by taxing individuals with alternative status of cohabitation differently by introducing two indicators. First, we use the difference between single and married people's tax burdens, where small (positive) values indicate that the tax and social security system is more neutral. Second, we use the difference between individuals' and married couples' tax burdens as a measure of tax distortions and scale it by the single individual's tax burden. This scaling is the crucial difference between these two measures. This 'tax

wedge' is also used by the OECD when evaluating the neutrality of a country's tax system. In both cases higher positive numbers favour – from a tax perspective – the traditional breadwinner model.² Therefore, we expect a negative coefficient on female work in both cases.

Although it is reasonable to assume that tax distortions deter female labour force participation, a higher participation ratio could force political decision makers to change tax laws towards a more neutral tax system. Therefore, we use in some specifications lagged values of our tax distortion indicators to alleviate potential concerns about endogeneity. In addition, the absolute level of the tax burden might play a role for the working behaviour of women. In countries where a large part of the income is taxed by the government women might simply be forced to work in order to maintain the living standards of the family. Accounting for this, we control in some specifications for the absolute level of taxation.

Method and controls

The next section presents estimates using a panel of OECD countries during 1979–2002. Women's labour force participation does not vary in the short term.³ In addition, for some variables we do not have data on a yearly frequency. Accounting for this, 4-year averages will be used in the empirical analysis (similar approaches in labour market research have been chosen by Blanchard and Wolfers (2000), Daveri and Tabellini (2000) and de Haan et al. (2004)). The estimated equation can be written as follows:

$$Y_{it} = X\beta + \mu_1 \text{TaxDistortion} + \lambda_t + \varepsilon_{it} \quad (5)$$

where Y is female labour force participation ratio, X contains a set of controls and μ_1 captures the impact of the tax system. It is possible that some events, for example, the second oil price shock, affect the labour force participation of women similarly. We control for this effect by including time dummies λ_t .⁴ A model with fixed country effects is not shown for two reasons: first, this would result in a large loss in degrees of freedom. Second, some variables in the

regression equation change only rarely, for example, the tax distortion indicators. Using a fixed-effects estimator is an inappropriate way to estimate the coefficients of rarely changing variables precisely.⁵ Even when taking 4-year averages, adjustment is sluggish and results are therefore presented by correcting for serial correlation based on the autocorrelation of the residuals. Results are displayed by using panel corrected standard errors.

Women's decision to join the labour market does not depend solely on the tax burden. We include several variables in X that may also be important determinants of female labour force participation. Women's labour supply decisions may also depend on government programmes favouring an early return to the labour market following maternity. Therefore, we include expenditures on parental leave as one control variable. Whereas such transfers stabilize household incomes in the early post-birth phase, women's reintegration into the labour market also requires a well-developed childcare infrastructure. We use government childcare expenditures to control for differences in childcare arrangements across countries. Both variables are scaled by gross domestic product (GDP).

Besides transfers towards families, regulations on the labour market will also affect labour force participation by women. Thus, we include an indicator constructed by the OECD measuring employment protection legislation (EPL). The index captures regulations concerning hiring and firing (for a more detailed discussion, see Organisation for Economic Co-operation and Development, 1999). Higher scores of the index indicate stricter regulation standards. Given an identical tax burden and similar tastes for work, the labour force participation decision will depend on the gross wage women can earn in the labour market. Including pre-tax wages is problematic because the wage before taxes depends – among other factors – on the quantity of persons employed in the labour market and might be therefore endogenous. Following Genre et al. (2005) and Jaumotte (2003) we use as an instrument the human capital of women – operationalized by average years of schooling of women in a given country – as an indicator for the earnings abilities of women. Data are from the Barro and Lee (2000) human

capital dataset. The sign of the coefficient should be positive.

Beside skill and labour market condition measures, female labour force participation may be supported by partisan preferences. For this reason we include the share of social democratic ministers.⁶ Governments on the left of the political spectrum may be more open to participatory ideas and gender equity. Moreover, as Montanari (2000) notes in her study on the relationship between favourable taxation of one-income earner families and party ideology, a marriage subsidy is more advantageous to high-income households, which vote more often for conservative parties. Thus, we expect a positive coefficient.

Finally, employment of women may be driven by demand-side factors. In countries with high unemployment rates female labour force participation is restricted due to the unfavourable situation on the labour market. However, including the female unemployment rate might be problematic, because this variable is derived endogenously, too. One option to alleviate the problem somewhat is to use lagged values of the general unemployment rate rather the female unemployment rate. Data for standardized unemployment rates across OECD countries are from the OECD.

Results

Before turning to the results, we show some descriptive statistics across country groups. Following Esping-Andersen's (1990) terminology, we have classified the countries in liberal, conservative and social democratic states and, similarly to Ferrera (1996), we keep the three southern European states separate because their dissimilarities compared with the other groups are striking.⁷ Similar classifications excluding specific country families have been used by Daveri and Tabellini (2000) as well as de Haan et al. (2004). These authors have shown that the impact of taxation on unemployment is conditional on the inclusion of specific country groups. However, the Esping-Andersen typology has been widely criticized, especially when analysing gender-related questions (Bambra, 2007; Sainsbury, 1999). Most

Table 1. Descriptive statistics: sample means across country families (1979–2002)

	Conservative	Liberal	South/low GDP	Scandinavian
Unemployment (%)	6.2	8.2	9.8	5.9
Left government (%)	31.3	37.7	68.4	53.3
Years of schooling	7.8	9.9	5.4	9.2
Maternity expenditure (%)	0.17	0.06	0.10	0.61
Childcaring expenditure (%)	0.32	0.14	0.08	1.25
EPL	2.5	1.1	3.6	2.5
Tax wedge (%)	46.8	37.0	37.2	34.1
Difference single	13.2	9.7	6.4	12.2
Tax rate single (%)	28.2	26.2	17.2	35.8
Tax rate married (%)	15.0	16.6	10.8	23.7
Participation ratio (%)	54.5	59.4	49.4	73.8
Countries	8	6	3	4

important, it fails to recognize gender as a form of social stratification and is unaware of the role of women and the family in the provision of welfare. For this reason, we also test the sensitivity of the results by applying a jackknife analysis. Jackknife analysis is a tool that allows us to test the robustness of results and the calculation of upper and lower bounds of the coefficients of interest. Thus, by excluding each country once from the analysis, it offers an indication on coefficient robustness.

As Table 1 shows, female labour force participation is by far highest in the four Scandinavian countries followed by the liberal countries. However, there are many candidates beside taxes, which might explain the differences between the Scandinavian countries and the other country groups. First, restrictions due to high unemployment rates have been less severe in the 1980s and 1990s. Moreover, women in northern Europe have a better educational attainment, and expenditures on parental leave and child-care are highest in the Scandinavian countries. However, the distortions by large tax concessions towards children or by taxing the male breadwinner more favourably are less pronounced in the Scandinavian countries – regardless of whether we use the tax wedge or (to a lesser extent) the absolute difference of the tax burden of the two groups as an indicator of tax distortions. In the liberal states only, the distortions induced by the tax system are somewhat less pronounced reflecting the switch of the

UK towards a system of separate taxation during the period of investigation, which was already in force in Canada and Australia.

Female labour force participation is lowest in the continental welfare states and in southern Europe. One candidate able to explain the low participation ratios might be the tax system, because in these countries more often a system of joint taxation or a split system is in force. Policies towards families differ, however, not only with respect to taxation; child-care and parental leave expenditures are lower, too. Finally, at least the southern European countries also share strict employment regulation standards and the human capital of women is considerably lower than in the other country groups.

Table 2 shows the results for the period 1979–2002 excluding EPL in columns 1 and 2 for which data prior to the second period are not available. There is strong evidence that in countries with well-educated female labour force participation is higher. An increase by one more year of school attendance is associated with an increase of female labour force participation by roughly two percentage points. Thus, higher (at least perceived) wage opportunities are crucial for the differences in women's willingness to work – across countries and across time.

However, although female work is largely driven by market forces, as reflected by the negative coefficient of the overall unemployment rate, this does not mean that governmental policies are without

Table 2. Determinants of female labour force participation (1979–2002)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Childcare (% of GDP)	6.955*** (4.31)	7.287*** (4.83)	7.418*** (3.96)	7.909*** (4.30)	4.557 (1.67)*	5.113*** (5.00)
Parental leave (% of GDP)	3.615* (1.83)	3.577** (2.14)	3.781* (1.75)	3.868** (2.14)	5.059 (1.27)	3.191** (1.99)
Human capital	2.175*** (5.78)	2.310*** (7.04)	1.704*** (3.33)	1.823*** (4.36)	1.549*** (2.65)	1.465*** (2.60)
Unemployment (t–1)	–0.839*** (–5.12)	–0.803*** (–5.40)	–0.916*** (–5.70)	–0.860*** (–6.27)	–1.176*** (–5.56)	–1.012*** (–5.66)
Left government	0.011* (1.79)	0.011* (1.87)	0.018* (1.83)	0.018** (2.03)	0.040** (2.12)	0.019** (1.96)
EPL			–0.103 (–1.59)	–0.121*** (–2.82)	–0.074 (–0.70)	–0.085 (–1.53)
Tax rate married (t–1)					0.218 (1.15)	0.265*** (3.62)
Tax wedge	–0.027** (–2.42)		–0.038*** (–2.85)			
Difference single		–0.193*** (–3.61)		–0.271*** (–7.85)		
Tax wedge (t–1)					–0.014 (–0.27)	
Difference single (t–1)						–0.133*** (–3.49)
R ²	0.827	0.829	0.816	0.818	0.799	0.835
n	101	102	93	94	93	94

t values are shown in parentheses.

*p < 0.10; **p < 0.05; ***p < 0.01.

All regressions are corrected for serial correlation and use panel corrected standard errors.

impact. There is strong evidence that larger expenditures towards families positively influence women's decisions to (return to) work. Increasing governmental childcare expenditures by 1 percentage point of GDP increases female labour force participation by roughly 6 percentage points on average. Income stabilization during maternity leave also promotes employment of women. However, the effect is weaker than that of childcare, perhaps because it may be dependent to the scheme designs. For example, Jaumotte (2003) notes that a long scheme duration impedes women's reintegration into the labour market. Other authors conclude that extended parental leave may be accompanied by income losses (Ruhm, 1998).

Columns 3 and 4 show the results when we further include EPL into the regression equation. Data for EPL are not available for the period 1979–82, leaving fewer cases for the analysis. As one can infer from Table 2 the results on the controls are not altered when concentrating on the period 1983–2002. There is some evidence that strict EPL may impede female work, but the coefficient is not significant across all specifications.

Interestingly, female labour force participation is higher when left-wing parties are strong. The significant coefficients can implicate different interpretations. First, since the regression model might not capture all relevant governmental actions encouraging female employment, including the share of social

Table 3. Jackknife analysis (1979–2002)

Exclusion of	Childcare	Parental leave	Human capital	Unemployment	Left government	Difference single
Austria	7.141*** (4.70)	3.871 (1.39)	2.296*** (7.78)	-0.812*** (-6.66)	0.011** (2.01)	-0.193*** (-3.09)
Australia	7.323*** (4.81)	3.681** (2.02)	2.278*** (7.19)	-0.814*** (-5.54)	0.012** (2.11)	-0.172*** (-3.57)
Belgium	7.251*** (4.69)	3.700** (2.04)	2.282*** (7.72)	-0.785*** (-5.45)	0.011* (1.76)	-0.092 (-1.45)
Canada	7.731*** (5.43)	3.072* (1.77)	2.176*** (6.55)	-0.824*** (-5.97)	0.007 (0.98)	-0.229*** (-3.27)
Denmark	4.551*** (3.39)	6.186*** (3.71)	2.366*** (7.50)	-0.825*** (-4.97)	0.017** (2.49)	-0.254*** (-3.77)
Finland	6.389*** (7.41)	4.906** (2.44)	2.231*** (7.11)	-0.942*** (-5.80)	0.012* (1.81)	-0.107** (-2.00)
France	7.768*** (4.49)	2.615 (1.49)	2.313*** (7.10)	-0.765*** (-5.26)	0.013* (1.92)	-0.205*** (-3.90)
Germany	7.328*** (4.90)	3.409** (1.98)	2.357*** (7.31)	-0.836*** (-5.44)	0.009 (1.35)	-0.209*** (-3.21)
Greece	6.898*** (4.17)	3.095** (1.97)	2.134*** (6.69)	-0.831*** (-5.89)	0.016** (2.50)	-0.321*** (-4.52)
Ireland	6.761*** (4.69)	4.328*** (2.80)	2.385*** (8.16)	-0.701*** (-4.25)	0.013** (2.10)	-0.068 (-1.01)
Italy	7.233*** (5.10)	3.507** (2.34)	1.975*** (7.05)	-0.795*** (-6.36)	0.008* (1.75)	-0.229*** (-5.25)
Japan	7.098*** (4.71)	3.156* (1.81)	2.305*** (6.76)	-0.936*** (-6.48)	0.008 (1.55)	-0.197*** (-3.07)
Netherlands	8.695*** (5.09)	0.954 (0.53)	2.317*** (7.29)	-0.819*** (-5.87)	0.004 (0.53)	-0.326*** (-3.75)
New Zeal.	7.342*** (4.62)	3.182* (1.76)	2.381*** (7.51)	-0.773*** (-4.93)	0.011 (1.60)	-0.221*** (-3.91)
Norway	7.249*** (4.48)	3.840** (2.38)	2.399*** (8.12)	-0.747*** (-5.00)	0.014** (2.20)	-0.224*** (-4.87)
Portugal	7.804*** (5.37)	4.221*** (3.11)	3.388*** (11.68)	-0.649*** (-4.26)	-0.001 (-0.23)	-0.131*** (-4.94)
Spain	7.079*** (4.86)	3.725** (2.40)	2.241*** (6.08)	-0.800*** (-5.02)	0.017*** (3.23)	-0.206*** (-3.09)
Sweden	7.373*** (7.23)	3.665* (1.89)	2.358*** (6.42)	-0.804*** (-5.30)	0.011 (1.55)	-0.213*** (-3.07)
Switzerland	7.335*** (4.73)	4.637*** (2.77)	2.295*** (7.26)	-0.704*** (-4.94)	0.012** (2.25)	-0.181*** (-3.49)
UK	8.202*** (4.46)	3.275 (1.40)	2.200*** (5.98)	-0.906*** (-5.36)	0.020** (2.26)	-0.082 (-1.01)
USA	7.643*** (4.58)	3.755** (2.03)	2.107*** (4.54)	-0.817*** (-5.01)	0.011* (1.68)	-0.189*** (-2.91)

t values are shown in parentheses.

*p < 0.10; **p < 0.05; ***p < 0.01.

All regressions are corrected for serial correlation and use panel corrected standard errors.

democratic ministers might control for these (omitted) factors. An obvious candidate is the size of the government. Especially in Scandinavian countries, the long history of social democratic governments supported a larger governmental sector offering women favourable job opportunities with flexible working hours and higher job security.⁸ Thus, the ‘social democratic service state’ can be said to turn formerly unpaid work into paid work (Estevez-Abe, 2006; Huber and Stephens, 2000). A second, alternative interpretation could be that the positive coefficient reflects the cultural environment towards female labour. As long as these norms are correlated with partisan preferences and female working behaviour is influenced by these ‘soft’ factors, the coefficients might reflect the impact of these norms. However, such an interpretation would suggest that a positive norm towards female employment is more often found in countries with a long social democratic

history. While the first interpretation is supported by previous studies, the second remains speculative.

Both measures of tax distortions, either operationalized by the difference of the tax burden of a single taxpayer compared with a married couple or the tax wedge, have the right signs and are significant, with one exception, at least on the 5 percent level. For example, if the burden of a single taxpayer is 10 percentage points higher than the couple’s tax burden, female labour force participation is roughly 2 percentage points lower (column 2). In Germany, for example, the difference between a married couple and a single taxpayer’s tax burden was on average 15 percentage points. Therefore, a switch towards a system of separate taxation would increase female employment roughly by 450,000 persons in this country. The results remain mainly robust when we additionally introduce the EPL measure and the absolute level of taxation (columns 3–6). The impact

of the absolute tax burden on female employment is unstable.

Taken together, large distortions produced by a country's tax system affect female labour force participation negatively and favour the traditional breadwinner model. However, educational attainment and economic circumstances seem to be more important in explaining female working behaviour across OECD countries, although governments have the opportunity to encourage the decision to work of women by implementing a more neutral tax system.

Up to now it has been shown that large tax distortions have reduced female work incentives across the OECD countries during the 1980s and 1990s. One important question is whether our results for our tax distortions measures remain stable with respect to the inclusion of specific countries. In order to evaluate the robustness of the results a jackknife analysis is performed.

Table 3 shows the results when each country is excluded from the analysis once.⁹ The impact of demand-side factors, human capital and provision of childcare is always significant, indicating that high unemployment and low educational standards deter female employment in general. Providing childcare appears to be a government's most important policy instrument. However, parental leave expenditures and tax system neutrality also positively affect female employment. For example, the *t* value of the tax distortion variable is always at least -1 and in 18 of the 21 regressions statistically significant. Government ideology offers less stable results, though we still find a statistically significant relationship in the majority of cases.

For the tax distortion measure, we get the upper and lower bound of the estimates when we exclude Greece (or the Netherlands) or Ireland (or the UK). The case of Greece can be easily interpreted: though the tax system favoured the traditional male breadwinner model, the absolute difference between a married couple and a single individual is quite low. This reflects the generally low level of taxation of an average income household in Greece. In addition, small differences in taxation – owing to a system of individualized taxation – between the breadwinner model and single households may be responsible for the large values when excluding the Netherlands (Dingeldey, 2001).

Interestingly, we receive lower bounds when excluding Ireland or the UK. Both countries operated a tax system with large distortions in the past. While these distortions are still present in Ireland, the UK switched towards a more neutral tax system in the beginning of the 1990s. Thus, our analysis confirms Smith et al.'s (2003) result from micro data that the Irish tax system does not promote employment of women. In sum, the analysis suggests that an increase in tax distortions by 10 percentage points reduces female labour force participation at the margin between 0.7 (lower bound) and 3.2 percentage points (upper bound).

Thus, the large participation ratios in Scandinavian countries can be partly explained by a more neutral tax system. Taken together, tax distortions have played some role in deterring female employment in the past and a further reduction of these distortions could promote more female employment in the OECD countries.

Conclusion

This paper has investigated whether tax disincentives including tax concessions towards children as well as favourable taxation of married couples can explain the large differences in female working behaviour across time and countries. The results suggest that tax distortions towards married families have a negative impact on female employment.

What are the policy implications? First, a marriage subsidy is costly from a purely static point of view, because tax payments are lower when both partners specialize than when both partners contribute equally to household income. Second, it is also costly in terms of foregone revenue, because households adapt endogenously to the constraints of the tax system. Finally, the disincentive effects might be at odds with other policy aims. If one accepts that (re-)integrating women into the labour market is an important policy objective – either because it promotes women's economic independence or to finance a growing dependency ratio in the future – joint income or income-splitting tax systems behave as powerful constraints. Due to data restrictions, the analysis has focused on an average household. However, the specific impact of the tax system might depend on couples' income

opportunities, for example because incentives might interact with other benefits for low-income households in complex ways (Figari, 2010). Thus, it would be interesting to expand the analysis towards high- and low-income households in the future. Such an extension would offer a richer picture beyond the average household, and one could also analyse the distributional implications of these tax systems.

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Notes

1. Elschner and Schwager (2007) also consider social security payments in their study of highly skilled labour mainly as a burden on labour. Their approach is somewhat different from that of the OECD, because they classify unemployment and accident insurance as a burden on the employee, whereas contributions to the healthcare system are assumed to follow the equivalence principle.
2. Theoretically, it is ambiguous whether it is the man who earns the household income. However, as Figari et al. (2007) showed, in all European countries the income of the man exceeds the income of the woman on average.
3. This is only true at the macro level. At the micro level female labour supply is much more unstable (for example, because of maternity) than that of men. I owe this suggestion to one of the referees.
4. Moreover, the coefficients of the time dummies might also capture changing norms. Including time dummies is the simplest way to proxy for these norms, but assumes that (1) the effect over time is identical across countries and (2) cross-country variation at a given point of time is negligible. This is clearly an oversimplification. As Pfau-Effinger (2005) notes, there are widespread cultural differences in family models in European societies, and one way to check for these norms is to investigate survey data. However, most survey data do not stretch back to the 1970s and it is therefore impossible to incorporate survey data results in this analysis.
5. We have experimented with a two-way fixed-effects estimator and failed to find any significant effects of the tax system on female labour force participation

rates, indicating that variation over time is too scarce to identify the effect precisely.

6. I have also experimented with trade union density but the measure was not robustly related to the employment rate, perhaps because for a long time men from the working class have been the main members of trade unions.
7. Liberal countries are: USA, UK, Canada, Australia, New Zealand and Ireland. Finland, Sweden, Norway and Denmark belong to the Scandinavian group, whereas Portugal, Greece and Spain belong to the group of southern European countries. The continental European countries represent the conservative welfare state group.
8. Indeed, party ideology may correlate with female-friendly firm-level policies. Unfortunately, there are no data on firm-level policies over a long time span available. Questionnaire data taken from the OECD family database indicate that in the cross-section the correlation coefficient between the labour force participation rate and whether work hours being fully set by the employer is -0.69 (or in the case where it is set by the employee 0.56). In European countries, where at least 25 percent of work hours may be done from home, female employment is higher (correlation coefficient 0.47). A closer look at the countries where such flexible work arrangements are more often observed shows that Scandinavian countries rank first. While it is beyond this paper's scope to investigate firm-level policies in detail, these countries' long social democratic history suggests that the party ideology variable might capture the impact of these policies to some extent.
9. The results are similar when using our alternative indicators of tax distortion and are suppressed for space reasons.

References

- Bambra, C. (2007) 'Defamilisation and Welfare State Regimes: A Cluster Analysis', *International Journal of Social Welfare* 16(4): 326–38.
- Barro, R.J. and Lee, J.-W. (2000) 'International Data on Educational Attainment: Updates and Implications', *Center for International Development (CID) Working Paper No. 42*. Cambridge, MA: Harvard Kennedy School, CID.
- Becker, G. (1965) 'A Theory of the Allocation of Time', *Economic Journal* 75: 493–517.
- Becker, G. (1985), 'Human Capital, Effort, and the Sexual Division of Labor', *Journal of Labor Economics* 3: S33–S58.

- Bergs, C., Fuest, C., Peichl, A. and Schaefer, T. (2007) 'Reformoptionen der Familienbesteuerung. Aufkommens, Verteilungs, und Arbeitsangebotseffekte', *Jahrbuch für Wirtschaftswissenschaften* 58(1): 1–27.
- Blanchard, O. and Wolfers, J. (2000) 'The Role of Shocks and Institutions in the Rise of European Unemployment: The Aggregate Evidence', *Economic Journal* 113: C1–C33.
- Castles, F.G. (1998) *Comparative Public Policy*. Cheltenham: Edward Elgar.
- Castles, F.G. (2003) 'The World Turned Upside Down: Below Replacement Fertility, Changing Preferences and Family-Friendly Public Policy in 21 OECD countries', *Journal of European Social Policy* 13: 209–27.
- Crompton, R. (2006) *Employment and the Family: The Reconfiguration of Work and Family Life in Contemporary Societies*. Cambridge: Cambridge University Press.
- Daly, M. (2011) 'What Adult Worker Model? A Critical Look at Recent Social Policy Reform in Europe from a Gender and Family Perspective', *Social Politics* 18(1): 1–23.
- Daveri, F. and Tabellini, G. (2000) 'Unemployment, Growth and Taxation in Industrialized Countries', *Economic Policy* 30: 49–104.
- De Haan, J., Sturm, J.-E. and Volkerink, B. (2004) 'How to Measure the Tax Burden on Labor at the Macro Level', in P.B. Sorensen (ed.) *Measuring the Tax Burden on Capital and Labor*. Cambridge, MA: MIT Press, CESifo Seminar Series.
- Del Boca, D. and Locatelli, M. (2006) 'The Determinants of Motherhood and Work Status: A Survey', *Institute for the Study of Labor (IZA) Discussion Paper No. 2414*. Bonn: IZA.
- Dingeldey, I. (2001) 'European Tax Systems and Their Impact on Family Employment Patterns', *Journal of Social Policy* 30(4): 653–72.
- Elschner, C., and Schwager, R. (2007) 'A Simulation Method to Measure the Effective Tax Rate on Highly Skilled Labor', *Finanzarchiv* 63(4): 563–82.
- Esping-Andersen, G. (1990) *The Three Worlds of Welfare Capitalism*. New York: Polity Press.
- Estevez-Abe, M. (2006) 'Gendering the Varieties of Capitalism: A Study of Occupational Segregation in Advanced Industrial Societies', *World Politics* 59(1): 142–75.
- European Commission's Expert Group on Gender and Employment Issues (2009) 'The Provision of Child-care Services: A Comparative Review of 30 European Countries'. Available at www.ec.europa.eu/social/BlobServlet?docId=2803&langId=en (accessed 20 March 2011).
- Ferrera, M. (1996) 'The "Southern" Model of Welfare in Social Europe', *Journal of European Social Policy* 6 (1): 17–37.
- Figari, F. (2010) 'Can in Work Benefits Improve Social Inclusion in the Southern European Countries', *Journal of European Social Policy* 20(4): 301–15.
- Figari, F., Immervoll, H., Levy, H. and Sutherland, H. (2007) 'Inequalities within Couples: Market Incomes and the Role of Taxes and Benefits in Europe', *EUROMOD Working Paper No. EM6/07*. Colchester: University of Essex, Institute for Social & Economic Research.
- Genre, V., Salvador, R. and Lamo, A. (2005) 'European Women: Why Do (n't) They Work?', *European Central Bank (ECB) Working Paper Series No. 454*. Frankfurt am Main: ECB.
- Gustafsson, S. (1992) 'Separate Taxation and Married Women's Labour Supply: A Comparison of West Germany and Sweden', *Journal of Population Economics* 9: 325–48.
- Gutierrez-Domenech, M. (2005) 'Employment after Motherhood: A European Comparison', *Labour Economics* 121(1): 99–123.
- Huber, E. and Stephens, J.D. (2000) 'Partisan Governance, Women's Employment and the Social Democratic Service State', *American Sociological Review* 65(3): 323–42.
- Iversen, T. and Rosenbluth, F. (2006) 'The Political Economy of Gender: Explaining Cross-National Variation in the Gender Division of Labor and the Gender Voting Gap', *American Journal of Political Science* 50 (1): 1–19.
- Jaumotte, F. (2003) 'Female Labour Force Participation: Past Trends and Main Determinants in OECD Countries', *OECD Working Paper No. 30*. Paris: OECD.
- LaLumia, S. (2008) 'The Effects of Joint Taxation of Married Couples on Labor Supply and Non-Wage Income', *Journal of Public Economics* 92(7): 1698–719.
- Lewis, J. (2001) 'The Decline of the Male Breadwinner Model: Implications for Work and Care', *Social Politics* 8(2): 152–69.
- Montanari, I. (2000) 'From Family Wage to Marriage Subsidy and Child Benefits: Controversy and Consensus in the Development of Family Support', *Journal of European Social Policy* 10(4): 307–33.
- O'Donoghue, C. and Sutherland, H. (1998) 'Accounting for the Family: The Treatment of Marriage and Children in

- European Income Tax Systems', *UNICEF, Occasional Papers No. 65*. Florence: UNICEF.
- Organisation for Economic Co-operation and Development (1999) *Employment Outlook*. Paris: OECD.
- Organisation for Economic Co-operation and Development (2008) *Taxing Wages*. Paris: OECD.
- Pechman, J.A. and Engelhardt, G.V. (1990) 'The Income Tax Treatment of the Family: An International Perspective', *National Tax Journal* 43(1): 1–22.
- Pfau-Effinger, B. (2005) 'Culture and Welfare State Policies: Reflections on a Complex Interrelation', *Journal of Social Policy* 34(1): 3–20.
- Rubery, J., Smith, M., Anxo, D. and Flood, L. (2001) 'The Future European Labor Supply: The Critical Role of the Family', *Feminist Economics* 7(3): 33–69.
- Ruhm, C.J. (1998) 'The Economic Consequences of Parental Leave Mandates: Lessons from Europe', *Quarterly Journal of Economics* 113(1): 285–317.
- Sainsbury, D. (1999) *Gender and Welfare State Regimes*. Oxford: Oxford University Press.
- Smith, N., Dex, S., Vlasblom, J.D. and Callan, T. (2003) 'The Effects of Taxation on Married Women's Labour Supply Across Four Countries', *Oxford Economic Papers* 55: 417–39.