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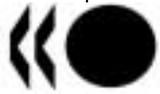
Female Labour Force
Participation: Past Trends
and Main Determinants in
OECD Countries

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**FEMALE LABOUR FORCE PARTICIPATION: PAST TRENDS AND MAIN DETERMINANTS IN
OECD COUNTRIES**

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By Florence Jaumotte

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ABSTRACT/RESUMÉ

Female labour force participation: past trends and main determinants in OECD countries

This paper examines the determinants of female labour force participation in OECD countries, including a number of policy instruments such as the tax treatment of second earners (relative to single individuals), childcare subsidies, child benefits, paid maternity and parental leaves, and tax incentives to sharing market work between spouses. The econometric analysis uses a panel data set covering 17 OECD countries over the period 1985-1999, and distinguishes between part-time and full-time female participation rates. It shows a positive impact on female participation of a more neutral tax treatment of second earners (relative to single individuals), stronger tax incentives to share market work between spouses, childcare subsidies, and paid maternity and parental leaves. Unlike childcare subsidies, child benefits reduce female participation due to an income effect and their lump-sum character. Finally, female education, the general labour market conditions, and cultural attitudes remain major determinants of female participation.

JEL Classification: H21, H31, H50, J13, J16, J21, J22

Key words: Efficiency, Optimal Taxation; Fiscal Policies and Behaviour of Households; Government Expenditures; Child Care; Economics of Gender; Labour Force and Employment, Size and Structure; Time Allocation and Labour Supply (part-time employment, work sharing)

Participation des femmes au marché du travail : tendances passées et principaux déterminants dans les pays de l'OCDE

Cet article examine les déterminants de la participation des femmes au marché du travail dans les pays de l'OCDE, incluant un certain nombre d'instruments de politique économique tels que le traitement fiscal du deuxième revenu du foyer (par rapport à la taxation d'un individu célibataire), les subsides aux dépenses de garde d'enfants, les allocations familiales, les congés de maternité et parentaux rémunérés, ainsi que les incitants fiscaux à partager le travail rémunéré entre époux. L'analyse économétrique utilise une base de données de panel couvrant 17 pays de l'OCDE sur la période 1985-1999, et distingue entre taux de participation féminine à temps partiel et à temps complet. Elle révèle que la participation féminine est stimulée par un traitement fiscal plus neutre du deuxième revenu du foyer, de plus grands incitants fiscaux à partager le travail rémunéré entre époux, les subsides aux dépenses de garde d'enfants, et par les congés de maternité et parentaux rémunérés. Contrairement aux subsides aux dépenses de garde d'enfants, les allocations familiales réduisent la participation féminine suite à un effet revenu et à leur caractère forfaitaire. Finalement, l'éducation des femmes, les conditions générales sur le marché du travail, et les attitudes culturelles restent des déterminants majeurs de la participation féminine.

Classification JEL : H21, H31, H50, J13, J16, J21, J22

Mots Clés : Efficience, Taxation Optimale; Politiques Publiques et Comportement des Ménages; Dépenses Publiques; Garde d'Enfants; Economie de l'Egalité des Sexes; Force de Travail et Emploi, Taille et Structure; Allocation du Temps et Offre de Travail (emploi à temps partiel, partage du travail)

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FEMALE LABOUR FORCE PARTICIPATION: PAST TRENDS AND MAIN DETERMINANTS IN OECD COUNTRIES

Florence Jaumotte¹

1. Introduction

1. The female labour force participation has increased strongly in most OECD countries over the last few decades (Figure 1). The timing of the increase has varied across countries, with some countries starting earlier (*e.g.* the Nordics and the United States), and in the last two decades the largest increases have been observed in lower income countries (Spain, Italy, Greece, Portugal, and Ireland) as well as in some Northern European countries (Netherlands, Belgium, Luxembourg, and Germany). However, large cross-country differences in the levels of female participation persist. Focusing on prime-age women (25-54 years old), their participation rate ranges from values close to or below 60 per cent in Turkey, Korea, Mexico, and Southern European countries (with the exception of Portugal) to values well above 80 per cent in the Nordic countries and some Eastern European countries. Female labour force participation has been identified as the most important factor in explaining increases in aggregate participation rates as well as the current cross-country variation of aggregate participation rates (Burniaux *et al.*, 2003).

[Figure 1: Factors behind the trend increase in female participation rates, 1981-2001]

2. A high female participation rate may be desirable on several grounds. In most countries, preferences for female participation (in particular among couples with young children) are much higher than actual female participation rates. To the extent that female participation remains at a depressed level due to market failures and policy distortions, removing these could lead to a higher level of welfare. The analysis in this paper essentially focuses on identifying such market failures and policy distortions. However, the issue of female participation is also the nexus of concerns about gender equity, poverty, and child well-being. Gender equity and poverty reduction (in case of marital separation) provide grounds to advocate for an increase in female participation. The issue of child development and well-being is more complex. On the whole, the empirical evidence seems to find a beneficial effect of formal day care on the child's development, except for very young children (less than one year old) where negative effects are more commonly found.

¹. OECD Economics Department, 2 rue André Pascal, 75775 Paris Cedex 16, France (Email: Florence.Jaumotte@oecd.org). The author wishes to thank Jean-Marc Burniaux, Romain Duval, Mike Feiner, Jorgen Elmeskov and Willi Leibfritz for useful comments on an earlier draft of this paper, as well as Irene Sinha for excellent secretarial assistance. Thanks also go to Willem Adema, John Bennett, Christopher Heady, and Mark Pearson for early discussions on this paper. This paper has benefited from excellent statistical assistance of Catherine Chapuis-Grabiner and from data kindly provided by the Directorate for Employment, Labour and Social Affairs (Pascal Marianna), the Directorate for Financial, Fiscal, and Enterprise Affairs (Jacques Naturkrejt and Thomas McGirr), and the Directorate for Education (Claire Shewbridge).

3. More recently, interest in female participation has been grounded in preoccupations about population ageing. The greying of the population will put downward pressure on labour supply, with negative implications for material living standards and public finances. Increasing female participation could partially help resolve this problem (Burniaux *et al.*, 2003). Policies helping women to reconcile work and family life are also politically more acceptable than policies aimed at maintaining older people longer in work.

4. This paper aims to assess the role of various factors in determining the pattern of female participation rates in OECD countries. The main focus of the policy analysis is on married women with children, for whom actual participation is well below preferences. A number of policy instruments are included in the analysis, such as the tax treatment of second earners (relative to single individuals), childcare subsidies, child benefits, paid parental leaves, and tax incentives to share market work between spouses. The role of other determinants, such as female education and labour market conditions, is also considered. The originality of the econometric study lies in the broad country coverage (17 OECD countries over the period 1985-1999), in marked contrast with the single-country focus of most studies. OECD countries present a wide range of policies and experiences in the area of female participation, thereby providing a valuable source of information on the relative effectiveness of various policies. The analysis is based on macroeconomic data which allows estimating the aggregate impact of policy instruments rather than the responsiveness of individuals to microeconomic incentives.² One other advantage of the use of macroeconomic data is that the estimated coefficients incorporate to some extent general equilibrium effects (at least those on women themselves).

5. The empirical analysis yields several results. First, policies which stimulate female participation include a more neutral tax treatment of second earners (relative to single individuals), tax incentives to share market work between spouses, childcare subsidies, and paid parental leaves. Childcare subsidies and paid parental leaves tend to stimulate full-time participation rather than part-time participation. Second, contrary to childcare subsidies, child benefits exert a negative impact on female participation, due to an income effect and their lump-sum character. Third, the availability of part-time work opportunities also tends to raise participation, at least in countries with a strong female preference for part-time work. Finally, female education, well-functioning labour markets (which translate into low unemployment) and cultural attitudes (captured as part of the fixed effects) remain major determinants of female participation.

6. The remainder of the paper is organised as follows. After discussing preferences for female participation across countries and over time (Section 2), the paper reviews factors which depress female participation, and policies to stimulate female participation (Section 3). The relative role of these factors is assessed using a multivariate econometric analysis, and the effects of policy reforms are examined based on these results (Section 4). Finally, the paper discusses some considerations for policymaking (Section 5) before concluding (Section 6).

2. Preferences for female participation

7. As framework for analysing female labour supply, the time allocation model (Becker, 1965) recognises that women not only arbitrate between leisure and labour, but between leisure, labour (supplied in the market in order to buy goods and services) and home production of goods and services. The latter includes caring for their children. Supplying (additional) labour to the market (and earning a wage) is worthwhile as long as the (additional) earnings can purchase more goods and services than required to make up for the lost home production (and possibly also some loss of leisure). Home production is crucial to explain women's weaker attachment to the labour market as, traditionally, home production is often

² Although the literature has evolved towards the use of microeconomic data, there are examples of recent papers using macroeconomic data (*e.g.* Bertola *et al.*, 2002; and Pissarides *et al.*, 2003).

regarded as a better alternative to market production for women than for men. Related to this, the elasticity of female labour supply to the market wage is higher, in particular for married women (*e.g.* Trieste, 1990). Children further increase the elasticity of female labour supply to the market wage, as they provide more opportunities for home production. On the other hand, education strengthens the attachment of women to the labour market, by increasing their potential earnings in the labour market and reducing the scope for specialisation within the couple. Figure 1 shows that the trend increase in female participation rates (Panel A) has usually been associated with a decline in the proportion of married women (Panel B) or more generally women living in couples (Panel C), a decline in the number of children per woman (Panel D),³ and an increase in female educational levels (Panel E), though the direction of causality is uncertain.⁴ Other factors behind the rise in female participation include the diffusion of new household technologies which have freed part of women's time for participation in the labour market, and the improvement in working conditions (both in terms of status and work hours).

8. Preferences for female participation are high in most countries. A survey carried out in EU countries in 1998, which examined the preferences of couples with small children, found that only one in ten preferred the traditional male- (only) breadwinner model (except in Spain where preferences were somewhat higher) (Table 1). Preferences, however, differ with respect to the extent of participation – full-time or part-time (Section 3). Another international survey which is more dated (carried out in 1994) but has wider coverage suggests that the traditional male breadwinner model is the preferred model only in Eastern European countries (Czech Republic, Hungary and Poland); this result is somewhat surprising as during the communist era female labour participation was very high and it also differs from preferences in Eastern Germany which are clearly (and much more than in Western Germany) in favour of the dual-earner model. According to this survey preferences for female labour participation are highest in Nordic countries, but also in North America, and this is also reflected in relatively high actual participation rates (Table 2).

[Table 1: Actual and preferred employment patterns by full-time and part-time working, 1998]

[Table 2: ISSP survey of national preferences on the gender roles model, 1994]

9. Large discrepancies remain between actual and preferred employment patterns, pointing to a large potential for increasing female labour participation. Indeed, Table 1 shows that the male breadwinner model is still much more common among couples with young children than seems to be desired. According to the European Labour Force Survey, the percentage of inactive women who would like to work is, on average, 12 per cent in the 19 countries covered by this survey. Table 3 shows it is higher for inactive women of prime-working age (18 per cent), for women with middle or higher education levels (15 per cent), and amongst women who do not seek a job because of family responsibilities (21 per cent). The implied increase in the participation rate of women aged 25-54 years if these groups of women were to participate would be four percentage points on average. It is higher in Eastern European countries, Italy, the United Kingdom and, to a lesser extent, in Austria and Denmark (Figure 2). These estimates of volitional participation would, however, not suffice for low-participation countries to converge to high-participation countries. In reality, the willingness of currently inactive women to work is distorted by a multitude of factors, the most important of which are examined in the next Section. Removing some of these barriers may stimulate more activity than is implied by the volitional estimates just presented.

³ It is interesting to note that there was no decline in the number of children per woman in the United States, and a positive trend in Luxembourg and Switzerland. Although it is not shown in the figure, a trend reversal could also be observed at the end of the period in Denmark, Norway, and the Netherlands.

⁴ There are also signs of cross-sectional correlation between female participation and some of the variables, namely a negative correlation with marriage and a positive correlation with education.

[Table 3: Volitional labour force participation among inactive women, 2000-2001]**[Figure 2: Volitional estimate of potential participation of women aged 25-54 years, 2001]****3. Policies affecting female labour participation⁵****3.1 Family Taxation**

10. The tax system imposes excessive distortions on the labour supply decisions of married women, compared with those of men and single women. Indeed, optimal taxation implies that the total deadweight loss of the tax system is reduced if marginal tax rates are lower for those individuals whose labour supply is more elastic and, thus, more sensitive to marginal tax rates (Boskin and Sheshinski, 1983).⁶ The implication would be to tax married women and mothers less than men and single women. This may be unrealistic, however, because it conflicts with the principle of equal taxation for equal income. However, in most OECD countries married women are effectively taxed more heavily than men and single women, providing scope for a move to neutrality. The relevant “marginal” tax rate for a married woman’s decision to participate or not in the labour market is the average tax rate on the second-earner’s earnings, defined as the proportion of these earnings that goes into paying increased household taxes. Table 4 compares tax rates on second earners and on single individuals, for earnings levels of 67 per cent and 100 per cent of Average Production Worker earnings (APW).⁷ Only in a few countries (Finland, Sweden, Luxembourg, Greece, Hungary, Turkey, Mexico, Korea) are second earners and single individuals taxed equally. At the other extreme, Iceland, Ireland, and the Czech Republic have very high relative tax burdens for second earners. In some countries the difference is bigger for lower income earners. There is ample evidence that high marginal tax rates reduce labour supply⁸ and, as labour supply is more elastic for females than for males, the impact on female labour participation could be significant.

[Table 4: Comparison of tax rates of single persons and second earners, 2000-2001]

11. Starting at the beginning of the 1970s, the focus of tax policy has shifted from equal treatment of families toward equal treatment of individuals and more neutrality with respect to individual work incentives, in particular for married women (O’Donoghue and Sutherland, 1999). While most countries applied joint taxation of couples at the beginning of the 1970s, almost all countries now have separate taxation (OECD, 2001a). However, the tax rate on second earners remains significantly higher than on single individuals, even in countries with separate taxation. To a large extent this is due to the loss of the dependent spouse allowance which still exists in most systems. On the other hand, some countries have

⁵ Appendix 1 describes in details the definition and sources of the data used in Sub-Sections 3.1, 3.2, 3.3, and 3.4.

⁶ A more general analysis of the deadweight loss of the income tax recognises that it depends on the cross-elasticities of labour supply within the couple (between the male and female partners, and with other income earners in the household), on distortions to the pattern of consumption, as well as distortions to the nature of labour supply. Some of these issues are addressed in the policy discussion (Section 5).

⁷ The husband of the married woman is assumed to earn 100 per cent of APW, and the family is assumed to count two children. The tax rates include employee’s social security contributions and are netted from universal cash benefits. A more complete measure would have included employer’s social security contributions (which in the long-run are paid by employees through lower wages) and indirect taxes. However, this would not affect significantly the tax wedge between second earners and single individuals (defined as the ratio of tax rates). Finally, means-tested benefits based on household income are not included (apart from some child benefits that vary with income) due to limited time-series information. However, these are less relevant for household earnings levels of 100 per cent of APW or more.

⁸ See for example Journal of Human Resources (1990) for evidence on various countries.

introduced a number of family-based tax measures. Smith *et al.* (2003) show for Britain, Denmark, Ireland, and East and West Germany that the tax system – joint, split or separate taxation – as well as the level and progressivity of the tax rates have large effects on the labour supply of married women. Over the past two decades, relative tax rates of second earners declined in Nordic countries and the United States, while they increased significantly in some other countries (Figure 3).

[Figure 3: Evolution of the relative tax rate of second earners and single persons (for earnings of 67 per cent of APW), 1981-2001]

12. Note that the average rate of taxation of the household (as opposed to the second earner) has an income effect on the participation of the second earner. Thus, a low household average tax rate leads to a lower participation of the second earner (see for example Smith *et al.*, 2003).

3.2 *Childcare subsidies⁹ and child benefits*

13. From the perspective of removing distortions to female labour supply, there are a number of arguments that justify childcare subsidies, in particular in cases where the tax and benefit system distorts the female labour supply, when a compressed wage structure limits the supply of affordable childcare, or when there are imperfections in credit markets. In the first instance, childcare subsidies help reduce the effective tax burden on mothers, whose labour supply is more elastic to the marginal tax rate (see for example Krashinsky, 1981). In the second case, the compressed wage structure raises the wages of carers (who tend to be concentrated at the bottom of the wage distribution) relative to those of mothers and thereby reduces access of mothers to childcare (wages are the main component of childcare costs). The case that imperfections in the credit market justify subsidised childcare is limited to low-income families. Credit market imperfections may prevent women in low-income families from borrowing against future earnings to finance childcare and break away from welfare dependence (Walker, 1996). The implicit assumption is that employment facilitates the accumulation of human capital and work experience which will generate future earnings sufficiently high to repay the initial loan. Thus, childcare subsidies could be expected to result in lower future welfare spending (Robins, 1991).¹⁰ Other justifications for childcare which are beyond the scope of this paper include child development and social integration, as well as gender equity.

14. The empirical evidence shows that childcare subsidies do increase female labour supply, though in some instances their effectiveness is reduced as, for example, women substitute formal for informal childcare (see Box 1). Another form of government support for families with children is child benefits. The main difference with childcare subsidies is that they are not conditioned on the use of childcare services. While childcare subsidies reduce the relative price of childcare and, therefore, increase the relative return of market work, child benefits only have an income effect and may just lead to a reduction in labour supply.¹¹ Thus, although they may be justified on grounds of horizontal equity across different family types and reducing child poverty, child benefits are less desirable than childcare subsidies from the angle of raising female participation.

⁹ Childcare can take several forms: maternal care (when the mother takes care of her own child), informal care (when relatives or friends take care of the child for free or at a low cost), formal day care (which includes day-care centres, family day care provided at the home of the carer, care provided by live-in nannies), and pre-primary school. Childcare subsidies are usually targeted at formal day care and pre-primary school.

¹⁰ Recent evidence (OECD, 2003a) shows however that many low-skilled workers have difficulties moving up the wage and career ladder.

¹¹ However, if liquidity constraints prevented the second earner from working because she was unable to pay for childcare, the increase in income could lead to an increase in labour supply (Stiglitz, 2000).

Box 1. Empirical evidence on the effectiveness of childcare subsidies in raising female labour supply

A number of micro-econometric studies, in particular for the United States, find a negative elasticity of female labour force participation (or employment) to childcare costs.¹ Gelbach (2002), for example, finds large positive effects of access to free public kindergartens on the employment probability of single mothers in the United States. Chevalier and Viitanen (2002) find that the availability of formal childcare increases female labour force participation in the United Kingdom.

However, there are different views about the size of the effects of childcare support on female labour participation or employment. For example, the estimated elasticity of female labour supply to childcare cost ranges for the United States between 0.06 to -1.24, depending on the underlying model and the measure of childcare cost. Blau (2000) and Anderson and Levine (2000) argue that the more plausible values are relatively low, of the order of -0.1/-0.2 up to a maximum of -0.4. There is also some evidence that the childcare cost elasticity differs with the level of education and income, and may be higher for low-income/less skilled mothers. The evidence on whether the elasticity differs by marital status is mixed, but it is higher for mothers of younger than older children.

The effectiveness of childcare support is, however, reduced by two types of substitution effects. First, public provision of childcare partly substitutes for private expenditure, to the extent that working mothers previously bought private childcare services. Second, childcare subsidies may encourage working mothers to switch from unpaid and informal childcare arrangements to paid and formal childcare. Blau and Hagy (1998) find that full subsidisation of all non-parental care would induce a ten per cent increase in mothers' employment, but a 19 per cent increase in the use of paid childcare arrangements.² Michalopoulos *et al.* (1992) also find that an increase in childcare subsidies stimulates labour supply, but considerably less so than childcare expenditures. They conclude that the primary beneficiaries of more generous subsidies are current users of high-quality free care who are induced to purchase slightly higher-quality market care.

Another important issue is that of causality between female participation and childcare support for families. Chevalier and Viitanen (2002) for example test for "Granger causality", and find that while childcare "Granger-causes" female participation in the United Kingdom, the reverse does not hold. Gelbach (2002)'s study for the United States also provides strong evidence of causality from childcare support to female participation. However, for some countries, the sequencing of labour supply changes and policy changes over time seems to point to some reverse causation, from strong female full-time participation to strong pro-full-time paid work institutions (e.g. Denmark).

1. See for example Anderson and Levine (2000) and Blau (2000) for a review of studies on the United States; Gustafsson and Stafford (1992) for Sweden; Del Boca (2002) for Italy.

2. The probability of choosing family day care would increase by 23 per cent, centre care by 12 per cent, and other forms of non-parental care would decrease by two per cent.

15. The size of government childcare support and the kind which is provided differ across countries. On average, OECD countries (for which data are available) spent 0.7 per cent of GDP on formal day care and pre-primary education in 1999 (Table 5). This spending is highest in mainland Nordic countries, where it amounts to between 1.5 to 2.7 per cent of GDP; these countries have increased their spending significantly since the mid-1980s. Spending per child¹² is lowest in Turkey, Korea, Mexico, New Zealand, Australia, Switzerland, and the Slovak Republic. However, the need for childcare subsidies may be less in some of these countries due to relatively small distortions arising from the tax system or from policies that compress the wage structure.

[Table 5: Childcare support, child benefits, and paid maternity leave]

¹² Spending per child is calculated as total government spending on formal day care and pre-primary education in a given year, divided by the number of children of age lower than the age of entry to primary school. Cross-country differences in ages of entry to primary school are thus taken into account.

16. Child benefits (including tax allowances) increase the disposable income of families with two children on average (for countries where data are available) by 7.5 per cent. In a number of countries this increase amounts to between ten and 20 per cent and some of these countries have significantly increased spending on child benefits over the past decades (Table 5 and Figure 4). By contrast, child benefits are very low in some countries which also have relatively low public childcare spending (Turkey, Korea, Mexico, New Zealand, Greece, Spain and Japan).

[Figure 4: Evolution of child benefits measured as the percent increase in disposable income for two children, 1981-2001]

17. Governments also support families by granting tax allowances for private childcare expenses. However, comparable data on tax expenditures for childcare are not available for most countries and are therefore not included in Table 5. These expenditures are a more important component of childcare support in English-speaking countries. However, even in the United States and Canada, for which data are available, they only account for about ten per cent of total public spending on childcare (including pre-primary school).

3.3 *Parental leave*

18. Another form of childcare support most governments provide to parents is maternity leave, parental leave, and childcare leave. These leaves boost female participation by helping women to reconcile working and family lives. The job security dimension also strengthens the continuity of their attachment to the labour market, though negative effects on hiring can not be excluded. Ruhm (1998) finds evidence that paid parental leave increased employment rates in the nine OECD countries covered by his study.¹³ However, taking parental leave for an extended period may also deteriorate labour market skills, and damage future career paths and earnings (Edin and Gustavsson, 2001). There is some evidence that very long parental leaves make it more difficult for women to return to the labour market (*e.g.* Ondrich *et al.* 1998). The problem is more acute when the parental leave is not accompanied by a job-guarantee, and the mothers are low-skilled. Ruhm (1998) and OECD (2002a) also find evidence that extended parental leaves have a negative impact on the salary of returning mothers. In marked contrast, a recent Danish survey reports a (progressive) catch-up of mothers' salary to those of childless women, as they compensate for their lack of capital accumulation (Gupta and Smith, 2002).

19. Table 5 reports the maximum number of paid leave weeks to which a mother is entitled, calculated as the maximum number of leave weeks multiplied by the income replacement rate. The latter is the statutory replacement rate and does not take into account means-tests nor private negotiated arrangements that top up legislated provisions. Leave reserved for the father is not included. In 1999, the average length of paid leave was 26 weeks. There was no paid leave entitlement in Australia, the United States, and New Zealand (New Zealand recently introduced paid leave). Paid leave was also relatively short (less than three months) in the United Kingdom, Ireland, Japan, Greece, Turkey, and Mexico. The longest paid leave is found in France, the Slovak Republic, and the Nordic countries. Figure 5 shows the evolution of paid parental leave between 1981 and 1999. The generosity of paid parental leave has increased in all countries, with the exceptions of the United Kingdom and Ireland.

[Figure 5: Evolution of paid parental leaves measured in maximum number of paid leave weeks, 1981-1999]

¹³ A portion of the positive relationship between paid leave duration and the employment-population ratio reflects the fact that mothers on parental leave are counted as employed (but absent from work), rather than not employed. Ruhm (1998) estimates that it accounts for between one-quarter to one-half of the total estimated employment effect.

3.4 *Flexibility of working-time arrangements*

20. In OECD countries about one-quarter of female workers at age 25-54 have part-time jobs. Countries where this share is high include the Netherlands (54 per cent), Switzerland, Japan, the United Kingdom, and Australia (between almost 40 and almost 50 per cent). The countries with the least women in part-time jobs are those in Eastern Europe, Korea, Finland, and Portugal (Table 6). While average proportions of part-time work barely changed over the past two decades, it declined significantly in Nordic countries (as women moved to full-time jobs) and increased most in some other European countries and in Japan (Figure 6).

[Table 6: Percentage of employed women in part-time jobs (age 25-54) and tax incentives to share market work within the couple, 1999]

[Figure 6: Evolution of the proportion of women aged 25-54 in part-time jobs, 1983-2001]

21. Part-time working is often seen as a means to facilitate the integration of women in the labour market, by allowing them to combine market work with family responsibilities. Table 7 provides information on the reasons why women work part-time. It shows that in a number of countries (such as Germany, Austria, the United Kingdom, Switzerland, and Belgium), a large percentage of women work part-time because of family responsibilities (which include childcare and care for elderly family members). The possibility to find a part-time job may be crucial to participation under such circumstances. One indication of this is that even in a country like the Netherlands, where part-time working is fairly common, Euwals (2001) finds that the flexibility of working hours is low,¹⁴ and women who want to work substantially fewer hours have a higher propensity to leave the labour market.

[Table 7: Part-time employment by reasons, 2001]

22. Preferences for part-time work, however, differ across countries. The previously mentioned EU survey (Section 2), which examined the preferences of couples with small children, found that part-time participation is the most frequently preferred working arrangement for women in the Netherlands, Germany, Austria, the United Kingdom and Ireland (Table 1). Preferences for part-time work are lower in Nordic countries (Finland, Sweden), Southern European countries (Portugal, Greece, Spain and Italy), and in some Western European countries (Belgium, France). Preferences for part-time are well above the current level of part-time in some countries, notably Italy, Ireland, Germany, and the Netherlands, and to a lesser extent Sweden, the United Kingdom, Austria, and Belgium. In these countries, an increase in part-time work opportunities would most likely raise female participation.

23. Box 2 reviews the determinants of the supply of and demand for female part-time work. Tax incentives to share market work between spouses may have a substantial impact on the female supply of part-time labour. Table 6 shows the increase in household disposable income which results from sharing market work. In the first situation, the husband earns 133 per cent of APW and the wife does not participate in the labour market while in the second situation, the husband earns only 100 per cent of APW and his wife earns the remaining 33 per cent, most likely by taking a part-time job. The resulting increase in disposable income was only three per cent on average across OECD countries in 1999. However, it was close to ten per cent in Mexico, Finland, and the United Kingdom. The tax incentives to share market work between spouses reflect the type of household taxation (joint or individual), the dependent spouse allowance, and the degree of progressivity in the tax schedule. These part-time incentives declined over the

¹⁴ The adjustment rate of actual to preferred lower hours was only 21 per cent within a job and 64 per cent across jobs (conditional on being able to adjust hours) (Euwals, 2001).

past two decades in Scandinavian countries and Spain, while they increased slightly in France, Germany, the United Kingdom, Canada, and Finland.

[Figure 7: Evolution of tax incentives for part-time work measured as the increase in disposable income when household earnings are split 100/33 instead of 133/0, 1981-2000]

Box 2. Determinants of the supply of and demand for female part-time labour

The supply of part-time labour by women is, to a large extent, driven by the gender-roles model. Thus, a part-time job is usually preferred over a full-time one by married women, mothers of young children, lower-educated women, and wealthy women. For example, Falzone (2000) finds that the number and younger ages of children, and the husband's income, increase the probability that a married woman works part-time rather than full-time. However, policy variables also influence the supply of part-time labour. Tax incentives to split income – and thus work hours – between spouses can influence the choice of married women between inactivity and part-time participation (OECD, 1990). On the other hand, the availability of affordable childcare and parental leave can affect both the choice between inactivity and activity, and the choice between part-time and full-time participation. For Canada, Powell (1998) finds that childcare subsidies stimulate both part-time and full-time employment, but more so full-time employment. The respective elasticities of full-time and part-time female employment to childcare costs are -0.71 and -0.21. Gustafsson and Stafford (1992) also find a very large elasticity (-1.88) of full-time employment, compared with elasticities of employment (including both part-time and full-time) typically found in the literature.

Demand for part-time workers by firms can arise from at least three motives. First, in the optimal staffing model, part-time jobs enable firms to better match labour to a changing workload. This model is particularly relevant for some segments of the service sector, where demand peaks at certain times of the day. In the secondary labour market model, firms create part-time positions to get cheaper and/or more flexible labour. This model applies when earnings and benefits are lower for part-time (even on a pro rata basis) and/or when full-time contracts benefit from high employment protection legislation. Finally, in the responsive firm model, firms create part-time jobs because their labour needs would otherwise remain unmet, particularly in female-dominated sectors, or because they wish to retain productive female workers who are temporarily facing family responsibilities. This model is more likely to apply when the female labour supply is low relative to the demand from firms. Firms then offer better working conditions for women in order to attract and/or retain more qualified and productive female workers.

Tijdens (2002) uses proxies for the gender-roles model and each of the three demand models to test their respective predictive power for the probability that a woman works part-time in the European Union. The gender-roles model and the responsive firm's model rank first and second, respectively. Tijdens also finds some evidence of the secondary labour market model in Austria, France, Great Britain, Ireland, and Eastern Germany. His findings should be taken with caution, however, as his proxies of the secondary labour market model do not include direct earnings or social security coverage data. He uses instead indicators on the existence of a basic fixed salary or wage and extra pay compensation for overtime or for unsocial hours.

3.5 *Anti-discrimination laws*

24. Gender discrimination in pay and promotion opportunities reduces the return to female market work and tends to depress female labour supply. Irrefutable empirical evidence on the existence of gender discrimination is difficult to obtain, because theoretically gender differences in pay and promotion could result from gender differences in unobserved characteristics (OECD, 2002b). It has also been argued that women may be under-represented at higher job levels because they voluntarily choose jobs that offer fewer opportunities for promotion, and not because of discrimination. However, it is equally impossible to demonstrate that there is no discrimination against women.

25. Some countries have introduced gender-specific anti-discrimination laws. These have been relatively effective in lowering the gender pay gap (*e.g.*, Australia, the United Kingdom, and the United States), and more rapidly so in countries that had more centralised wage bargaining structures at the time of introduction of the law (*e.g.*, Australia and the United Kingdom, as opposed to the United States). The higher wages stimulate female participation, but the evidence on employment effects is mixed. Research

on comparable worth policies in Australia, and for government employees in some US states, finds evidence of some modest employment losses. On the other hand, Manning (1996) finds no employment losses for women, despite substantial gains in relative wages due to the introduction of the UK's Equal Pay Act of 1970 and the Sex Discrimination Act of 1975.

26. Even in the absence of anti-discrimination laws, Blau and Kahn (1996) find that centralised wage-setting institutions greatly lower the gender pay gap (in addition to lowering the pay differentials along other dimensions). Minimum wage laws also improve the relative pay of women because a relatively high percentage of women are at the bottom of the wage distribution. The evidence shows limited employment effects of such institutions and policies. For example, Bertola, Blau, and Kahn (2002) find no effect of a larger role for unions (and higher relative earnings for women) on male-female employment differentials, although female unemployment rises relative to male unemployment due to an increase in female participation. Minimum wage laws also had little effect on employment, except in France, the Netherlands, and Spain (Blau and Kahn, 1999). These findings suggest that minimum wages have generally been set at sufficiently modest levels to have only small effects on female employment.

3.6 *Other policies*

27. Female participation may also be affected by other policies, albeit indirectly in some cases. First, labour market policies affect the participation decision of women through their impact on the unemployment rate. On the one hand, a high female unemployment rate tends to discourage female participation. On the other hand, a high male unemployment rate may stimulate female participation, as women join the labour market in order to compensate for the loss of family revenue due to their husband's unemployment. This is the so-called "added worker" effect.

28. High welfare and other income support payments relative to wages tend to discourage employment and activity, in particular of low-skilled people who have low potential earnings. In some countries, single mothers are particularly affected due to the fact that a large fraction of them are low-skilled. Evidence has been found that make-work-pay schemes (such as the Earned Income Tax Credit in the United States) significantly increase the activity rate of low-income people in general, and of single mothers in particular (see for example Meyer and Rosenbaum, 2000 and Meyer and Rosenbaum, 2001).¹⁵ Other key issues include job search obligations (in particular the age of the youngest child at which single mothers are required to look for work), and access to labour market programmes. Recently, labour market programmes for "mother returners" (not exclusively single mothers) have been introduced in some countries (*e.g.* Australia) to help women who have been out of the workforce for a long period of time while caring for their children to return to employment (OECD, 2002a).

29. Excessive regulations of the service market can hamper female participation in several ways. First, excessive regulation will tend to restrict the supply and drive up the prices of services such as childcare and household services. Restricted opening hours of shops also make it difficult for women to reconcile work and family life. Finally, by hindering the development of the service sector, excessive regulations of the service market may limit the creation of employment opportunities for women, who tend to be predominantly employed in the service sector. Pissarides *et al.* (2003) find evidence that product market regulation (measured as the administrative cost of set-up) has a strong negative impact on the growth of female employment.

¹⁵ Note that the predicted effects of the EITC are not all pro-work, especially with respect to hours and the labour market incentives for two-earner couples. The literature provides consistent evidence that the EITC positively affects labour force participation. However, it also finds smaller, negative effects on hours of work for people already in the labour market and for secondary earners (Hotz and Scholz, 2001).

30. The supply of affordable childcare may also be affected by immigration policies, as female immigrants from poorer countries seem to constitute an important pool of potential carers in some countries. Grandparents are another source of cheap childcare. Thus, population ageing may increase the supply of affordable childcare, although an increase in the retirement age would tend to decrease it. The rising share of older people may also create more caring responsibilities for women. In some countries (*e.g.* Ireland) a rapid increase in maternal labour supply was permitted by the existence of a large stock of informal carers, which resulted from initially low female participation. However, there is a dynamics at work, in that the very same increase in maternal labour supply reduces the available stock of informal carers for future cohorts.

31. Finally, short school hours in some countries make it difficult for mothers to take on full-time jobs. Recent surveys (OECD, 2002a) have identified this factor as a major constraint on passing from part-time to full-time work.

3.7 *Participation and fertility*

32. There could be a concern that raising female participation will reduce fertility. However, the cross-sectional evidence does not support such concerns (Figure 8). Nordic countries are characterised by a relatively high number of children despite high female participation rates, while Southern European countries have both low female participation rates and low fertility. Policies which help women reconcile work and family may actually stimulate both participation and fertility (see Sleebos (2003) for a review of the literature), providing an additional channel to reduce the future burden on younger generations of financing a growing number of retirees. On the one hand, such policies enable women who previously stayed at home to take care of their children to combine family life with participation in the labour market. On the other hand, women who had previously chosen to reduce their family size to participate in the labour market can now have more children.

[Figure 8: Female participation and fertility, 2000]

3.8 *Characterisation of the policy mix of countries*

33. While the preceding Sub-Sections have described individual policies, this Sub-Section takes an overall view and attempts to characterise the policy mix of countries with respect to female participation. Figure 9 examines the combinations of tax treatment of second earners, childcare support (measured by public childcare spending per child),¹⁶ and the incidence of female part-time work. For each country, it shows the deviation of these variables from the sample mean (expressed in multiples of standard deviations). Three broad groups of countries can be distinguished. The first group comprises the Nordic countries, France and Austria, and features a relatively favourable tax treatment of second earners, reinforced by high public childcare spending, but relatively low part-time work (with the exceptions of Norway and Iceland). These countries thus promote a model of full-time female participation supported by high childcare spending. They also have high participation rates of prime-age women, close to or higher than 80 per cent. The second group of countries is composed of a number of European countries (Germany, Netherlands, Belgium, United Kingdom, Ireland, and Switzerland) and Pacific countries (Australia, New Zealand, and Japan). In most of these countries, the tax treatment of second earners is close to average (with the exception of the United Kingdom, where it is quite favourable) and public childcare spending is

¹⁶ The indicator for childcare support is limited to public childcare spending per child, given the high positive correlation with the other indicators of childcare support, namely paid parental leaves and child benefits (see below). Introducing all three indicators would complicate the analysis. On the other hand, the indicators being measured in different units, they cannot be aggregated without an arbitrary assumption.

relatively low. As public childcare spending is lower than in the group of countries shown in Panel A, this policy mix favours part-time participation of women, which is widespread in many of these countries. Female participation rates in these countries are lower than in the first group, and quite dispersed (ranging from 60 to 78 per cent). The last group of countries comprises lower-income countries (Portugal, Spain, Turkey, Korea, Mexico, and the Czech Republic), as well as the United States and Canada (at the other end of the wealth spectrum). These countries share the features of low public childcare spending and low part-time incidence. However, their female participation rates fluctuate tremendously, ranging from very high levels in the United States, Canada, Portugal, and the Czech Republic (between 76 and 82 per cent) to very low levels in Spain, Turkey, Korea, and Mexico (60 per cent and below), despite a favourable tax treatment of second earners in some of the latter countries.

[Figure 9: Policy mixes, 1999]

34. Figure 10 examines how countries differ in the way they allocate childcare support, through public childcare spending, child benefits, and paid parental leaves. Although these three policies might be seen as substitutes, countries that do more of one seem to do more of all. Thus, these policies are highly positively correlated. Even so, public childcare expenditure is a relatively more important component of childcare support in Denmark, Norway, Sweden, Japan, and New Zealand. Paid parental leave is relatively more important in Finland, France, Spain, Mexico, and Turkey. Finally, child benefits are more important in Austria, Germany, the Netherlands, Belgium, the United Kingdom, the United States, Portugal, and Australia.

[Figure 10: Composition of childcare support, 1999]

35. Except for public childcare spending, there is little evidence of simple correlation between the participation of prime-age women and the main determinants of female participation examined in Section 3 (Figure 11). In several instances, the sign of the simple correlation is contrary to what theory predicts. However, such links are better identified by a multivariate econometric analysis, allowing to estimate partial correlations after controlling for other determinants.

[Figure 11: Simple correlations between labour force participation of women aged 25-54 years and selected variables, latest available year]

4. Multivariate econometric analysis

36. This Section is devoted to an econometric analysis of the determinants of female participation. The sample covers 17 OECD countries over the period 1985-1999 (most countries have data only for a sub-period). Due to data limitations, the analysis could not be made by cohort and uses instead the aggregate participation rate of prime-age women (25-54 years old) (see Burniaux *et al.*, 2003 for an analysis of cohort effects). However, to a large extent, cohort effects are captured by changes in the social-cultural variables, namely the proportion of married women, the number of children, and the female educational level (see specification below).¹⁷ Two different models are used for the estimation. In a first model (Model I), the dependent variable is the total female participation rate and the policy variables include the tax wedge between second earners and single individuals, public childcare spending per child, child benefits, paid parental leave, and the share of part-time in employment as a proxy for the flexibility of working-time arrangements. The specification also includes the proportion of married women, the number of children per woman (measured by the ratio of children aged 0-14 years to women aged 15-64

¹⁷ A time trend turned out insignificant, probably because the time span of the sample is relatively short and recent.

years¹⁸), female education (average years of education of women aged 25 years and over), the female and male unemployment rates, the degree of employment protection legislation (EPL),¹⁹ the degree of product market regulation (PMR),²⁰ and country fixed effects. Because the choice between part-time and full-time is to some extent simultaneous to the choice between activity and inactivity, the use of the share of part-time in employment as a regressor introduces a risk of bias of the estimated coefficients. To reduce this risk, the incidence of part-time work is instrumented by the variable measuring tax incentives to part-time. Other potentially endogenous variables include the unemployment rates and the public childcare spending. To minimise the risk of endogeneity, the unemployment rates are defined with respect to a larger age group (15-64 years old instead of 25-54 years old). In addition, the unemployment rates and public childcare spending per child are instrumented by their lagged values, as well as all the exogenous variables of the model. All variables are in natural logarithms except child benefits and tax incentives to part-time work, which are already in percent increase. The equations are estimated by two-stage least squares with heteroskedasticity-consistent standard errors.

37. The results from the estimation of this first model are reported in Table 8 (column 1). Although some of the coefficients are only significant at the ten per cent level, Figure 12 shows robust partial correlations of the expected sign for most policy variables (except child benefits), in marked contrast with the simple correlations of Figure 11.²¹ The main correlations can be summarized as follows. First, the wedge between the tax rates of second earners and single individuals (measured at an earnings level of 67 per cent of APW) has a negative impact on female labour force participation. Second, female participation appears to be stimulated by public spending on childcare (formal day care and pre-primary school) while child benefits, which do not alter the relative return of market work, have an insignificant effect. Third, paid parental leaves have a positive impact on female participation though, as found by other researchers, the marginal effect becomes negative for very long parental leaves (in excess of 20 weeks according to this paper's estimates). Fourth, the flexibility of working-time arrangements, imperfectly proxied by the share of part-time in female employment, also contributes to boost female participation. Finally, female participation remains determined to a significant extent by the level of female education and the general labour market conditions (captured by the unemployment rate). The net effect of the unemployment rate on female participation is negative, but is somewhat reduced by an added worker effect linked to the male unemployment rate.

[Table 8: Econometric estimates of the determinants of female labour force participation, (women 25-54 years old), OECD, 1985-1999]

[Figure 12: Partial correlations between labour force participation of women aged 25-54 years and selected variables, all available years]

38. The drawback in this first model is that, despite the use of instrumental variables, the causal links are complicated by the endogeneity of part-time work. Therefore a second model is estimated which endogenises part-time and distinguishes between full-time and part-time participation as dependent

¹⁸ The number of women refers to the age category 15-64 years old instead of 25-54 years because some of the children are cared for by younger mothers (15-24 years old).

¹⁹ The index of employment protection legislation covers both permanent and temporary contracts and is taken from Allard (2003) who, building on the OECD methodology, has developed a time-series for this variable.

²⁰ This OECD index of product market regulation covers 7 non-manufacturing sectors for which time-series data is available. See Nicoletti and Scarpetta (2003) for more details.

²¹ Partial correlations measure the correlations after the influence of other policy and control variables has been eliminated (see Appendix 2 for the methodology).

variables (Model II). The supply of part-time and full-time labour can not be measured perfectly, as the preferences for part-time or full-time can not be observed for unemployed people, nor for employed people who are constrained in their choice of hours worked. However, a proxy can be calculated by assuming the same distribution between part-time and full-time for the labour supply as for employment. Thus, the full-time and part-time participation rates are defined as the product of the share of full-time (respectively part-time) in employment and the participation rate. Model II is composed of two equations relating part-time and full-time participation respectively to the policy variables and other determinants. The set of policy variables does not include the share of part-time in employment anymore (since it has been endogenised) but it includes the tax incentives to part-time. Each participation rate (full-time and part-time) was initially regressed on all explanatory variables. The model was then re-estimated including only the variables which were significant, and allowing for maximum sample size in each equation (Table 8, columns 2 and 3).²² Some sensitivity tests are performed for the influence of the tax wedge between second earners and single individuals, and of public childcare spending (Table 9). The estimation of this second model confirms the results of the first model with statistical significance at the conventional level but also yields several new insights related to the distinction between part-time and full-time participation.²³

[Table 9: Sensitivity tests of the effects of taxation of second earners and public expenditures on childcare, OECD, 1985-1999]

39. First, the estimations confirm that a high tax wedge between second earners and single individuals exerts a negative impact on female participation. The effect is mostly on full-time participation, because of the level of earnings at which the tax wedge is measured (67 per cent of APW in Table 8 and 100 per cent of APW in Table 9). When introduced separately, the tax rates on second earners and single individuals have coefficients of similar magnitude but opposite sign (Table 9). The restriction of introducing them as a ratio can thus not be rejected.²⁴ Family taxation also appears to matter for part-time participation. The tax incentives to part-time, measured by the increase in disposable income resulting from sharing market work between spouses (involving earnings of 33 per cent of APW for the wife), are shown to have a strong positive effect on part-time participation.

²² Similarly, regarding the instrumenting of the unemployment rates and of public childcare spending per child, only the instruments which were significant in the initial estimation were kept for the re-estimation. They include the lagged values of the potentially endogenous variables, the index of employment protection legislation, the index of product market regulation, and the tax incentives to part-time.

²³ Although not reported here, the results are robust to the exclusion of outliers, and the correlation between the residuals of the two equations, for full-time and part-time participation (tested over a same sample size), is not significant. There may be omitted variables, in particular for the determinants of the demand for part-time workers by firms, but one can reasonably assume that they are not correlated with the supply side regressors.

²⁴ In this paper, the positive coefficient on the tax rate of single individuals has been interpreted as resulting from the use of the tax rate of single individuals as a benchmark against which the excess taxation of second earners is gauged. At least two other interpretations are possible. First, the general tax rate (proxied by the average tax rate of a single individual) may reflect the size of the public sector, and the positive coefficient may capture the beneficial effect which a larger public sector may have on female participation. Indeed, a larger public sector may imply a higher provision of public services which facilitate female participation and have not been controlled for in the regression (*e.g.* care for older people). It may also reflect more employment opportunities for women, as the public sector is a large employer of women in some countries. Second, the general tax rate captures to some extent the level of taxation of the husband. But a higher taxation of the husband will lead, through an income effect, to a higher participation of the wife. However, the similarity in the magnitudes of the coefficients on the taxation of single individuals and second earners seems to favour the interpretation retained in this paper.

40. Second, public childcare spending and paid parental leaves stimulate mostly full-time participation of women. This result is line with Powell's findings (1998) on the effects of childcare subsidies, although she finds a small positive effect of childcare subsidies on part-time participation. This result suggests that inadequate childcare is more a constraint for full-time than part-time participation. A sensitivity test (Table 9) shows that, when entered separately, only public spending on formal day care seems to have a significant effect on female participation while this is not the case for spending on pre-primary school. The lack of significance of public spending on pre-primary school could reflect the fact that many non-working mothers put their children in pre-primary school for educational purposes.

41. Third, although they did not appear to have a significant effect in model I, once the distinction is made between full-time and part-time participation, child benefits appear to have a clear negative impact on participation, mostly through part-time participation. It is indeed only for women working part-time that the income effect from child benefits is likely to be large enough to induce a reduction in participation. This confirms that, strictly from the point of view of raising female participation, childcare subsidies are preferable to child benefits which do not increase the return from market work of the mother.

42. Fourth, the degree of employment protection legislation seems to exert a positive influence on part-time participation. One possible reason for this effect is that a high degree of EPL may induce firms to resort to part-time contracts in order to achieve greater flexibility. This result could then be interpreted as showing that the availability of part-time work opportunities exerts a positive influence on part-time participation, confirming the result of Model I. The discussion of Figure 13 (see below) suggests however that the positive effect of the availability of part-time jobs on female participation may only apply in countries where female preferences for part-time are high.

43. The degree of product market regulation has no direct effect on female participation. However, part of this lack of effect is due to the fact that the regressions control for the unemployment rate and public childcare spending, which are themselves affected by PMR.²⁵ When these indirect influences are taken into account, PMR appears to exert a negative effect on female participation. The increase in participation between the lowest and highest sample values of PMR in 1999 is just below two percentage points. Pissarides et al. (2003) find a much stronger negative effect of product market regulation, although on female employment.²⁶

44. Finally, the estimations confirm the strong positive effect of education and the net negative effect of unemployment on female participation. However, these factors also affect the composition of participation in terms of full-time and part-time participation. Full-time female participation increases with the level of female education and the male unemployment rate (household wealth effect), and decreases with the female unemployment rate. The opposite relationships hold for part-time participation. Surprisingly, the number of children has a negative impact on part-time participation.

²⁵ PMR has a negative indirect effect on female participation by raising the female and male unemployment rates, and reducing public childcare spending in the first-stage regressions of the two-stage least squares. The negative effect on public childcare spending per child may reflect less demand for formal childcare services by mothers, as the private cost of such services and other household services is driven up by product market regulation.

²⁶ In addition to considering female employment instead of participation, their study differs from this paper in two other respects. First, their measure of product market regulation is limited to the cost of start-up of a business while this study includes an overall measure of product market regulation. Second, they only have an observation for the end of the 1990s (which they interact with time dummies) while this study uses yearly observations.

45. The econometric estimations allow quantifying the contributions of policies and other variables to differences in female participation rates. Based on model I, Figure 13 decomposes the percentage deviation of each country's female participation rate from the OECD average (for included countries in 1999) into the contributions of the various explanatory variables.^{27,28} The Nordic countries and France have the highest participation rates. As seen in Section 3, these countries share a similar policy mix. Their above-average performance is explained by the relatively favourable tax treatment of second earners, high public spending on childcare, generous parental leave, but also high female education (except in France). The negative participation effect implied by the relatively low part-time incidence is outweighed by large country fixed effects, possibly reflecting a misspecification of the role of part-time in these countries where preferences for part-time are relatively low.²⁹ In France and Finland, high unemployment exerts a negative effect on female participation. Other Northern European countries and Pacific countries (Australia, New Zealand, and Japan) feature lower levels of participation. These countries are characterised by an above-average contribution of the incidence of part-time and paid parental leave (except in Australia and New Zealand), but lower-than-average public childcare spending. The relatively low unemployment in most countries and high female education in Australia and New Zealand also contribute positively to female participation. The country fixed effects are below average, possibly reflecting weaker preferences for work or a misspecification of the part-time influence.

[Figure 13: Contributions of explanatory variables to female participation in percent deviation from OECD mean, 1999]

46. Despite having a low level of policies supporting female participation, the United States and Canada have high female participation rates, mostly due to low unemployment, high female education levels, and a large country fixed effect in the case of the United States. The latter may reflect a strong taste for work, though it may also capture other effects such as a misspecification of the part-time influence and the availability of market-based affordable childcare. Portugal's female participation rate is also higher than the OECD average, thanks to low unemployment, an above-average contribution of paid parental leave, and a large country fixed effect. The large country fixed effect in this case possibly reflects the availability of informal care, or the fact that low income levels make it necessary for both partners in the couple to work. Contrary to the United States and Canada, female participation in Portugal is hindered by low female education. Finally, female participation is very low in Spain, despite a large country fixed effect and an above-average contribution of paid parental leave. Beyond the low level of policies supporting female participation, further barriers to female participation include a low level of female education and a high unemployment rate.

²⁷ Model I is used instead of Model II because it is not possible to calculate contributions to female participation which are additive using Model II. Indeed, the specifications for full-time and part-time participation are logarithmic (geometric additivity), while total female participation is the sum of full-time and part-time participation (arithmetic additivity). Model I also presents the advantage of identifying directly the effect of the flexibility of working-time arrangements. See Appendix 2 for details on the methodology.

²⁸ Due to the logarithmic specification, the average actually refers to the geometric average. In Section 3, countries' policy mixes were characterised relative to the arithmetic average of policy variables in OECD countries. It is, therefore, possible that a given policy, which had a below-average value in the policy mix of a country, provides an above-average contribution to its female participation rate. This mostly occurs for paid parental leave, due to the facts that the specification is logarithmic and that the effect of this variable is not linear (square of the logarithm also matters).

²⁹ Country fixed effects capture factors that can not be explained by the model, and this is only one plausible interpretation.

47. Finally, Figure 14 highlights the contributions of the policy variables to full-time and part-time participation (measured in percent deviations from the OECD geometric average) using Model II, where part-time participation is endogenous. “Full-time policies”, which include the tax treatment of second earners, public childcare spending, and paid parental leave, explain at least 45 per cent of the deviation of full-time participation from the OECD average in about half of the sample countries (Nordics, France, Austria, Spain, New Zealand, and Australia). The explanatory power of “part-time policies” – tax incentives to part-time and child benefits – is somewhat lower, with these policies explaining at least 40 per cent of the deviation of part-time participation from the OECD average in the United Kingdom, Ireland, New Zealand, and Australia, and 25 per cent in the United States.

[Figure 14: Policy contributions to full-time and part-time participation, 1999]

5. Additional considerations for policy

5.1 *Part-time versus full-time work*

48. There is evidence that countries have different preferences regarding the choice between part-time and full-time participation. High preferences for part-time work in some countries may reflect genuine preferences of parents to spend time with their children, with both social and economic benefits. However, these preferences may also be shaped by current policies. For example a low supply of affordable childcare or short paid parental leave make full-time work difficult and part-time work a more attractive option. In these cases, there may be room to increase full-time participation with more supportive policies.

49. There is also a concern that in some countries part-time jobs may marginalise women in the labour market. This is the case when part-time jobs are characterised by poor wages and benefits, low job tenure, and absence of training, reducing women’s prospects of promotion and putting them at a higher risk of dropping out of the labour force (Box 3).³⁰ Such conditions may result from an excess supply of part-time work by women or from a negative signalling effect linked to part-time jobs. In these cases, raising the availability of affordable childcare and parental leave could possibly alleviate the marginalisation of women, by helping them turn to full-time jobs with more prospects. An alternative solution may be to reduce the negative future career consequences of a period spent in part-time work, for example by giving parents greater rights to change hours (including the right to work part-time but also to resume their full-time job).

³⁰ Note that this does not necessarily imply that part-time work is second best. Making such a case would require assessing the consumption and production benefits of parental care.

Box 3. Features of part-time and the risk of marginalization of women

There is a risk of marginalisation of women when part-time jobs are characterised by poor wages and benefits, low job tenure, and absence of training. The table below compares earnings and social security coverage in part-time and full-time jobs. The earnings figures show (for included countries) an average gap of 14 per cent in median hourly earnings of female part-time workers relative to their full-time counterparts. The gap is largest in English-speaking countries, namely the United States, Canada, and the United Kingdom. However, to measure the possible wage penalty, it is necessary to control for a number of earnings determinants. Such a study by Pissarides *et al.* (2003) for EU countries finds evidence of an hourly earnings penalty for part-time jobs in the United Kingdom, Ireland, and the Netherlands, but an hourly earnings premium in Germany, Austria, and Southern European countries. Blank (1990) also finds evidence of a small wage penalty associated with part-time work in the United States, after controlling for earnings determinants. The second part of the table shows the minimum thresholds that apply (in terms of hours worked or earnings) for social security coverage of part-timers (OECD, 1998). Thresholds are highest in Japan and Germany, and lowest in Southern European countries (except for public health benefits in Italy). In the United Kingdom, the threshold for social security coverage is quite low, however many women work very short hours (Daune-Richard, 1998). In the United States, part-timers have little access to company benefits, such as health and pension plans (Houseman and Osawa, 1998). Finally a study by the OECD (1999) shows that female part-timers are generally much less likely to receive employer-provided training than their full-time counterparts, even after controlling for a number of relevant determinants of the incidence of training.

Marginalisation can be measured by a difficulty to move to full-time jobs and/ or a weak attachment to the labour market. For example, O'Reilly and Bothfeld (2002) find that in the United Kingdom and Germany, only a small number of women are able to use part-time work as a bridge back into a full-time job. Instead, a substantial percentage drops out of employment, especially mothers of more than one child. For the United States, Miller (1997) finds that part-time experience increased the probability of part-time employment and decreased the probability of full-time employment, even if part-time work was taken up temporarily due to the existence of children. On the other hand, Blank (1989) and Farber (1999) conclude from evidence on labour market transitions in the United States that part-time and temporary work are often part of the transition out of unemployment, leading to regular full-time employment in the future.

Box 3. Features of part-time and the risk of marginalization of women contd.

Table 1. Earnings levels and social security coverage of part timers

	Median hourly earnings of female part-time workers ^{1,2} , 1995	Thresholds for social security coverage of part timers, 1998		
		Public health benefits	Old-age pension benefits	Unemployment benefits
Austria	..	Sch 3830/month (15 per cent of APW)	Sch 3830/month (15 per cent of APW)	Sch 3 830/month (15 per cent of APW; earning above this level for at least 52 weeks over preceding 2 years)
Belgium	86.8	400 hours in preceding 6 months or 3 hours/day	4 hours/day	-
Canada	69.8	-	C\$ 67/week or C\$ 3 500/year (10 per cent of APW)	No weekly minimum as of January 1997
Czech Republic	..	-	-	22 hours/week
Denmark	76.4	-	9 hours/week for Supplementary Pensions and 15 hours/week for labour market pension schemes in certain sectors	37 hours/week for at least 52 weeks over preceding 3 years
Finland	90.2	-	-	18 hours/week
France	81.7	200 hours in last 3 months	-	4 months contributions in last 8 months
Germany	87.5	15 hours/week (45 hours/month for blue-collars)	15 hours/week	18 hours/week
Greece	108.8	-	-	-
Ireland	..	earnings over Ir£ 9 256 (61 per cent of APW)	earning over Ir£ 2 600 (17 per cent of APW)	earning over Ir£ 2 600 (17 per cent of APW)
Italy	103.0	24 hours/week	-	-
Japan	..	20 hours/week	20 hours/week	20 hours/week
Luxembourg	77.5	-	-	-
Netherlands	93.1	-	-	26 weeks work during previous 39 for basic benefit (52 days/year in 4 out of 5 previous calendar years for wage-related benefits)
Portugal	113.0	12 days in last 4 months	-	-
Spain	84.0	-	-	-
Sweden	92.3	SKr 6 000/year (3 per cent of APW)	SKr 6 000/year (3 per cent of APW)	17 hours/week
United kingdom	69.6	-	£61/week (18 per cent of APW)	£61/week (18 per cent of APW)
United States	62.5	-	-	Depends on the State
Unweighted average	86.4			

"-" Means that there are no thresholds.

1. Percentage of median hourly earnings of full-time workers. The fact that the median earnings of women part timers is higher than those of full timers in a few southern European countries could in part be due to a statistical artefact if some employees with short hours but without a definite part time contract, are not counted as working part time.

2. 1993, industry only for Greece, 1994 for France, 1996 for United States, 1997 for Canada.

Source: Based on OECD (1998) and OECD (1999). Data on part-time earnings: Canada, Labour Force survey, 1997; EUROSTAT, Structure of Earnings Survey, 1995; United States, OECD Secretariat calculations using the 1996 US Bureau of Labor Statistics Current Population Survey annual earnings file. Data on social security coverage were supplied by national authorities on the basis of a questionnaire sent to all OECD member countries; and taken from the OECD Taxes and Benefits database.

5.2 *Enhancing the efficiency of childcare subsidies*

50. There are limits to the appropriate increases in childcare subsidies and cuts in tax rates. These policies will most likely impose a net budgetary cost, even though they may be partially self-financing.³¹ In turn, this may require an increase in tax rates creating other distortions in the economy, or a cut in other budgetary expenditures. Beyond the budgetary cost, childcare subsidies may encourage excessive consumption of household goods (such as childcare, both in quantity and quality) by reducing their price below their true social cost, and inefficiently discourage the consumption of material goods (Rosen, 1996).³² For example, Rosen argues that childcare subsidies in Sweden are too large, in the sense that a reduction in the subsidies accompanied by a budget-balancing reduction in marginal income taxes would increase efficiency, by reducing the excessive production of household goods.³³

51. Childcare subsidies can be made more effective, and hence less costly, by conditioning their receipt on the employment of the mother, or at least on active job search. From the perspective of stimulating female labour force participation, childcare subsidies conditioned on the mother's employment are preferable to child benefits which, due to their lump-sum character, have a negative impact on female participation. However, child benefits may be justified on grounds of horizontal equity across different family types and reducing child poverty.

52. Effectiveness can also be enhanced by targeting tax cuts and childcare subsidies to low-income mothers whose labour supply is more elastic to the net wage (Del Boca *et al.*, 2003). Low-income mothers are also more likely to be liquidity-constrained and, therefore, less able to finance the childcare needed in order to reach self-sufficiency (through the accumulation of work experience and human capital). However, greater targeting implies higher marginal effective tax rates as income rises, and careful design of the tax cuts and childcare subsidies is needed to limit the negative impact on the supply of hours.

53. The case for conditioning and targeting childcare subsidies also has to be weighted against the potential benefits of childcare subsidies for the children's future development and their integration into society, as well as equity concerns. There is evidence that childcare is beneficial for the children, at least when the child is three (see Kamerman *et al.* (2003) for a review of the literature). For children below six months or one year, negative effects are more commonly found.

54. Finally, the effectiveness of childcare subsidies and tax cuts in raising female participation requires that the childcare supply be responsive. Blau (2001) argues that the supply of childcare is very responsive because of the low capital requirement for home-based childcare arrangements. Indeed, he finds a high responsiveness of childcare supply in the United States.³⁴ Policies that may improve the

³¹ They are partially self-financing because the resulting increase in female labour supply leads to higher government revenues.

³² Rosen emphasises the trade-off between distortions to labour supply and to consumption. In his model, an increase in the childcare subsidy rate decreases the distortion to labour supply but increases the distortion to consumption. In addition, an increase in the marginal income tax rate, which may be required to finance the subsidies, further increases the distortion to production and consumption of household goods, while partially offsetting the reduction in the distortion to labour supply enacted by the subsidy.

³³ Of course, a full evaluation of the costs and benefits of childcare subsidies would have to take into account positive externalities on child development and socialisation, as well as considerations of equity (including gender equity). However, the magnitudes of efficiency losses estimated by Rosen are quite large, perhaps as large as half of the total value of household production attributed to women with small children.

³⁴ On the other hand, Chevalier and Viitanen (2002) cast doubt on the responsiveness of childcare supply in the United Kingdom, because they do not find "Granger-causality" from female participation to childcare supply.

responsiveness of the supply of affordable childcare include a lower degree of product market regulation, and less restrictive immigration policies.

5.3 *Trade-offs in the taxation of the family*

55. The choice between joint and separate taxation of the household involves trade-offs. Separate taxation is definitely preferable from the perspective of raising female participation, because it reduces distortions to married women's work incentives. However, this greater neutrality towards work incentives of second earners is achieved at the cost of less horizontal equity between families of different types. Indeed, under separate taxation, the tax paid by families with a same gross household income varies with the split of this income between the two spouses.

6. **Conclusions**

56. This paper has examined the factors underlying female participation in OECD countries. Surveys show preferences for the traditional male breadwinner model to be low among couples with small children, and point to a large potential for increasing female labour supply. After reviewing the market failures and distortions that may impede female participation, the paper provided new empirical evidence on their effect on female participation. The analysis yielded the following main policy conclusions:

- A more “neutral” tax treatment of the work incentives of second earners compared with single earners boosts female participation by increasing the return on married women's market work but also by increasing incentives to share market work between spouses, leading more inactive women to take on part-time jobs.
- Increasing the availability of part-time work opportunities also tends to raise female participation, though not by the same extent in all countries. Indeed, preferences for part-time working vary across countries. Though the preferred working arrangement in many European countries, part-time working is not considered attractive by women in most Nordic and Southern European countries. Finally, when part-time working entails a wage penalty, low social security coverage, job insecurity, and little training, it risks marginalising women in these jobs. In such instances, policy should aim at fostering better access to full-time jobs, or reduce the negative future career consequences of a period spent in part-time work
- Child benefits, essentially lump sum transfers for nursing children, generate an income effect that reduces female labour supply, particularly of potential part-time workers. A better alternative to child benefits – from the point of view of raising female labour supply – is childcare subsidies as they increase the return on market work. The case for increased public support for childcare may be particularly strong where a compressed wage structure limits the supply of affordable childcare (by making the relative cost of childcare higher) and/or where high tax wedges between second earners and single individuals distort female labour supply. Child benefits however may be justified on grounds of horizontal equity between families of different types and reducing poverty.
- The provision of paid parental leave also tends to boost female labour participation, by helping women to reconcile work and family life and strengthening their attachment to the labour market through a job guarantee. However, taking parental leave for an extended period of time may deteriorate labour market skills, and damage future career paths and earnings. Beyond 20 weeks, the marginal effect of additional parental leave on female participation becomes negative.

- Inadequate childcare is more a constraint for full-time than part-time participation. Indeed, the supply of affordable childcare and the provision of parental leave tend to stimulate more full-time than part-time participation. In addition, the supply of childcare appears more inadequate at the formal day care level rather than at the pre-primary school level.
- Childcare subsidies will be more effective and, hence, less costly, when conditioned on female labour force participation. Effectiveness can also be enhanced by targeting tax cuts and childcare subsidies to low-skilled women who suffer the largest distortion to their labour supply decision. The well-known incentive problems associated with targeting on income need, however, to be taken into account.

57. Although taxation and work-family reconciliation policies can have a significant impact on female participation, the econometric analysis also shows that female education, well-functioning labour markets (which translate into low unemployment), and cultural attitudes (captured by fixed effects) remain major determinants of female participation. Public policies fostering female education could thus also have a major impact on female participation. However, it should be noted that the education choice of a woman may depend to a large extent on her future career prospects and in particular on the policies which would help her reconcile work and family life. Where these policies are more developed, women should be more likely to invest in their education.

58. Finally, the evidence in the recent literature suggests that an increase in the level of female participation does not necessarily come at the cost of a reduction of fertility. Indeed, when the increase in female participation is supported by appropriate work-family reconciliation policies, women tend to achieve a higher level of labour force participation without reducing fertility, and even perhaps with a small increase in fertility.

Table 1. **Actual and preferred employment patterns by full-time and part-time working, 1998**
 Couple families with child under 6

	Percentages				
	Man full-time/ woman full-time	Man full-time/ woman part-time	Man full-time/ woman not employed	Other	Total
Finland					
Actual	49.3	6.4	32.8	11.5	100
Preferred	80.3	8.6	10.2	0.8	100
<i>Preferred-actual</i>	31.0	2.2	-22.6	-10.7	
Sweden					
Actual	51.1	13.3	24.9	10.7	100
Preferred	66.8	22.2	6.6	4.4	100
<i>Preferred-actual</i>	15.7	8.9	-18.3	-6.3	
Greece					
Actual	42.2	7.9	36.1	13.8	100
Preferred	65.6	10.6	9.4	14.4	100
<i>Preferred-actual</i>	23.4	2.7	-26.7	0.6	
Italy					
Actual	34.9	11.8	43.3	10.0	100
Preferred	50.4	27.7	10.7	11.2	100
<i>Preferred-actual</i>	15.5	15.9	-32.6	1.2	
Portugal					
Actual	74.5	4.7	18.7	2.2	100
Preferred	84.4	8.0	4.0	3.6	100
<i>Preferred-actual</i>	9.9	3.3	-14.7	1.4	
Spain					
Actual	25.6	6.3	56.9	11.2	100
Preferred	59.7	11.6	19.7	9.0	100
<i>Preferred-actual</i>	34.1	5.3	-37.2	-2.2	
Ireland					
Actual	30.8	18.7	37.0	13.5	100
Preferred	31.1	42.3	8.1	18.5	100
<i>Preferred-actual</i>	0.3	23.6	-28.9	5.0	
United Kingdom					
Actual	24.9	31.9	32.8	10.4	100
Preferred	21.3	41.8	13.3	23.6	100
<i>Preferred-actual</i>	-3.6	9.9	-19.5	13.2	
Austria					
Actual	19.1	28.2	48.1	4.5	100
Preferred	35.6	39.9	3.9	20.7	100
<i>Preferred-actual</i>	16.5	11.7	-44.2	16.2	
Germany					
Actual	15.7	23.1	52.3	8.9	100
Preferred	32.0	42.9	5.7	19.4	100
<i>Preferred-actual</i>	16.3	19.8	-46.6	10.5	
Netherlands					
Actual	4.8	54.8	33.7	6.7	100
Preferred	5.6	69.9	10.7	13.8	100
<i>Preferred-actual</i>	0.8	15.1	-23.0	7.1	
Belgium					
Actual	46.0	19.4	27.3	7.3	100
Preferred	54.8	28.8	13.4	3.0	100
<i>Preferred-actual</i>	8.8	9.4	-13.9	-4.3	
France					
Actual	38.8	14.4	38.3	8.4	100
Preferred	52.4	21.9	14.1	11.7	100
<i>Preferred-actual</i>	13.6	7.5	-24.2	3.3	
Luxembourg					
Actual	23.5	27.0	49.1	0.4	100
Preferred	27.5	29.9	12.4	30.2	100
<i>Preferred-actual</i>	4.0	2.9	-36.7	29.8	
Unweighted average					
Actual	34.4	19.1	38.0	8.5	100
Preferred	47.7	29.0	10.2	13.2	100
<i>Preferred-actual</i>	13.3	9.9	-27.8	4.6	

Source: Based on OECD (2001a). Secretariat calculations on the basis of microdata from the *Employment Options of the Future* survey.

Table 2. ISSP survey of national preferences on the gender roles model, 1994

	A man's job is to earn money; a woman's job is to look after the home and family				A pre-school child is likely to suffer if his or her mother works		
	Strongly agree or agree	Neither agree or disagree	Disagree or strongly disagree		Strongly agree or agree	Neither agree or disagree	Disagree or strongly disagree
Australia	27.3	17.6	55.0	Australia	50.2	14.1	35.6
Austria	48.1	15.6	36.3	Austria	73.3	9.0	17.8
Canada	10.5	12.1	77.4	Canada	31.3	16.4	52.3
Czech Republic	53.4	21.9	24.7	Czech Republic	49.7	18.1	32.2
Eastern Germany	11.2	10.2	78.6	Eastern Germany	33.7	15.6	50.7
Hungary	56.3	25.1	18.6	Hungary	73.7	14.8	11.4
Ireland	34.5	12.3	53.2	Ireland	49.1	8.5	42.3
Italy	32.5	17.9	49.5	Italy	68.1	14.0	18.0
Japan	39.8	20.3	39.9	Japan	38.9	20.7	40.4
Netherlands	19.0	17.2	63.8	Netherlands	45.1	20.3	34.6
New Zealand	23.5	17.0	59.5	New Zealand	51.1	16.1	32.9
Norway	15.6	14.7	69.7	Norway	37.3	18.6	44.0
Poland	67.0	13.0	20.0	Poland	69.7	7.2	23.1
Spain	37.4	9.1	53.6	Spain	54.2	9.5	36.3
Sweden	11.4	19.0	69.6	Sweden	28.5	23.1	48.3
United Kingdom	25.6	17.4	57.0	United Kingdom	39.2	18.3	42.5
United States	21.5	19.2	59.4	United States	41.5	12.4	46.2
Western Germany	37.2	15.1	47.7	Western Germany	71.1	10.8	18.2
Unweighted average	31.8	16.4	51.9	Unweighted average	50.3	14.9	34.8

Source: International Social Survey Programme, 1994.

Table 3. Volitional labour force participation among inactive women¹, 2000-2001

	Age				Education			Reason not seeking				Women with a child age 6	
	15-24	25-54	55-64	Total	Low	Middle	High	Illness	Education	Retirement	Family responsibilities		Other
Austria	11.7	24.9	5.9	14.8	12.3	17.1	16.6	27.5	12.5	5.8	20.3	26.2	29.1
Belgium	2.9	7.6	1.7	4.8	3.9	6.5	5.5	..	..	..	..	..	9.1
Denmark	25.1	30.4	5.0	20.2	18.9	18.9	27.8	11.8	27.0	3.3	36.8	63.7	..
Finland	31.7	19.6	7.7	18.0	19.7	18.3	13.7	7.4	28.6	..	11.6	49.1	..
France	1.3	6.6	1.1	3.2	2.7	3.8	3.6	50.0	..	..	50.1	3.1	7.1
Germany	7.3	14.8	2.7	8.4	7.5	9.9	13.7	19.8	7.3	1.4	13.1	8.5	17.2
Hungary	13.1	23.8	2.9	14.0	12.1	16.7	12.8	29.7	11.1	2.6	23.0	26.0	18.3
Iceland	31.7	30.5	25.5	29.9	34.1	23.5	29.8	28.8	19.5	..	32.9	53.7	..
Ireland	16.5	13.7	2.8	12.2	10.3	13.4	..	..	..	..	..	..	..
Italy	15.6	18.7	4.2	13.6	11.8	19.8	15.3	5.8	15.5	3.1	13.8	23.3	23.5
Luxembourg	4.9	6.3	0.7	4.5	4.2	5.1	4.8	10.8	4.4	..	4.4	6.0	7.2
Netherlands	23.4	15.8	4.5	13.1	11.6	15.2	13.9	..	..	..	..	..	19.4
Poland	15.7	32.7	8.0	19.6	12.8	25.9	28.3	13.9	14.2	6.4	36.5	35.5	..
Portugal	3.2	8.2	1.2	4.6	4.9	3.5	13.0	2.7	1.0	..	1.5	24.4	9.5
Slovak Republic	28.2	38.2	4.3	22.0	18.7	23.8	22.5	6.0	5.8	2.9	59.5	42.9	58.7
Spain	8.5	11.2	2.9	8.5	7.6	9.4	13.5	10.2	8.1	0.2	9.1	8.3	12.8
Sweden	11.0	9.4	6.3	9.6	12.1	8.3	5.8	..	..	..	..	..	..
Switzerland	19.8	19.6	9.2	16.6	17.6	14.9	24.1	12.5	19.1	8.7	16.8	33.5	..
United Kingdom	24.6	29.7	10.0	22.7	25.4	27.9	21.4	30.8	17.1	..	26.0	39.3	29.7
Unweighted average	15.6	19.0	5.6	13.7	13.1	14.8	15.9	17.8	13.7	3.8	23.6	29.6	20.1
Population weighted average	12.6	18.2	4.6	12.3	11.3	15.0	15.0	19.6	9.6	1.7	21.5	19.0	15.8

1. Percentage of group indicating they would like to have work.
Missing values are not taken into account, -- indicates non-significative.

Source: European Labour Force Survey 2001.

Table 4. Comparison of tax rates of single persons and second earners, 2000-2001¹

	Women earning 67 per cent of APW, 2001			Women earning 100 per cent of APW, 2000			Type of taxation system, 1999 ²
	Second-earner	Single	Ratio second-earner/single	Second-earner	Single	Ratio second-earner/single	
Australia	27	19	1.4	32	23	1.4	Separate
Austria	25	22	1.1	29	28	1.1	Separate
Belgium	51	34	1.5	53	42	1.3	Separate
Canada	32	21	1.5	36	27	1.4	Separate
Czech Republic	40	21	1.9	39	23	1.7	Separate
Denmark	50	41	1.2	51	44	1.2	Separate
Finland	26	26	1.0	34	34	1.0	Separate
France	26	21	1.2	26	27	1.0	Joint
Germany	50	34	1.5	53	42	1.3	Joint
Greece	16	16	1.0	18	18	1.0	Separate
Hungary	29	29	1.0	..	..	..	Separate
Iceland	42	15	2.8	42	21	2.0	Separate
Ireland	24	10	2.3	31	20	1.5	Optional/Joint
Italy	38	24	1.6	39	29	1.4	Separate
Japan	18	15	1.2	18	16	1.1	Separate
Korea	8	8	1.1	10	9	1.0	Separate
Luxembourg	20	19	1.0	28	27	1.1	Joint
Mexico	-4	-4	1.0	3	3	1.0	Separate
Netherlands	33	27	1.2	41	36	1.1	Separate
New Zealand	23	19	1.2	23	19	1.2	Separate
Norway	30	26	1.2	32	29	1.1	Optional
Poland	39	30	1.3	37	31	1.2	Optional
Portugal	17	13	1.3	20	18	1.1	Joint
Slovak Republic	27	18	1.5	35	20	1.7	n.a.
Spain	21	13	1.6	23	18	1.3	Separate (Joint)
Sweden	30	30	1.0	28	33	0.9	Separate
Switzerland	24	19	1.3	26	21	1.2	Joint
Turkey	29	29	1.0	29	29	1.0	Separate/Joint
United Kingdom	24	19	1.3	26	24	1.1	Separate
United States	29	22	1.3	30	26	1.2	Optional/Joint
Unweighted average	28	21	1.4	31	25	1.2	

1. The relevant "marginal" tax rate for a married woman's decision to participate or not in the labour market is the average tax rate on the second-earner's earnings, defined as the proportion of these earnings that goes into paying increased household taxes. The husband is assumed to earn 100 percent of APW and the couple is assumed to have two children. This tax rate is compared to the average tax rate for a single individual with same gross earnings as the second earner. The tax rates include employee's social security contributions and are netted from universal cash benefits. But they do not include employer's social security contribution, indirect taxes, nor means-tested benefits (except some child benefits that do vary with income). See Appendix 1 for details.

2. This information is taken from OECD (2001a). According to O'Donoghue and Sutherland (1999), while the systems in Greece, Italy, Austria and the Netherlands are best classified as separate taxation systems, they have a significant number of family-based tax measures. It should also be noted that several countries with separate taxation nevertheless give a small amount of extra tax relief in respect of a wife who is non-working, or working very little.

France: The system is a "quotient" system, which includes earnings from children.

Germany: Although spouses have the option of being assessed separately, according to Dingeldey (1998) there is never any financial advantage in doing so.

Norway: In most cases, the individual, but in some cases (spouse has no earned income or low income) optional taxation as a couple is more favourable.

Poland: "Splitting" system used, so joint taxation will normally be more advantageous.

Spain: According to Dingeldey (1998), although couples can opt for joint taxation, this is only advantageous for couples with a very low primary income and a minimal second income.

Turkey: Independent assessment unless one of them earns more than TL2.25bn, in which case it is joint.

United Kingdom: Married couple tax relief abolished in 2000.

United States: Married couples generally benefit if they opt for a joint return.

Source: OECD database "Taxing Wages"; OECD Tax Models; OECD (2001a).

Table 5. Childcare support, child benefits, and paid maternity leave

	Public expenditures on formal daycare and pre-primary education, 1999 ¹ in 1995 PPP-US\$ per child ²		Child benefits, 2001 Percentage increase in disposable income between family with 2 children and without children ³	Maternity, parental, and childcare leave, 1999	
	Total	of which formal daycare		Total	Paid ⁴
Australia	874	0.2	4	52	0
Austria	3251	0.9	18	86	38
Belgium	1900	0.5	15	67	31
Canada ⁵	1294	0.3	4	27	14
Czech Republic	1507	0.5	12	214	..
Denmark	8009	2.7	8	54	42
Finland	4186	1.5	9	164	55
France ⁶	4009	1.3	9	162	73
Germany	3084	0.8	12	162	38
Greece	..	..	1	29	8
Hungary	..	..	21	160	58
Iceland	3408	1.1	7	..	..
Ireland ⁶	1430	0.5	5	28	10
Italy	..	..	5	65	30
Japan ⁷	1252	0.3	2	58	8
Korea	144	0.1	0	61	..
Luxembourg	..	..	17	42	32
Mexico	612	0.5	0	12	12
Netherlands ⁸	2025	0.6	8	16	16
New Zealand ⁹	672	0.3	0	52	0
Norway	6085	1.6	8	116	..
Poland	..	..	4	122	35
Portugal	1289	0.5	7	121	17
Slovak Republic	1110	0.6	10	162	59
Spain ⁶	1234	0.4	2	164	16
Sweden	5530	1.9	10	85	40
Switzerland	919	0.3	10	16	..
Turkey	72	0.0	0	12	8
United Kingdom	1850	0.5	9	31	8
United States	1803	0.5	7	12	0
Unweighted average	2302	0.7	7.5	81.5	26.0

1. Public expenditures on formal daycare do not include tax expenditures (i.e. tax allowances and tax credits) unless if they are refundable.

2. Children between 0 and the age of admission to primary school.

3. The husband is assumed to earn 100 percent of APW, and the wife 33 percent of APW.

4. The number of paid leave weeks is calculated by weighting the leave weeks by the income replacement rate (as a percent of average manufacturing wage for women). The latter is the statutory replacement rate and does not take into account means-tests nor private negotiated arrangements that top up legislated provisions. Leave reserved for the father is not included.

5. Legislation introduced in 2001 increases the duration of parental leave from 10 to 35 weeks.

6. Public expenditures on formal daycare and pre-primary education refer to 1998.

7. Formal daycare expenditures are for 2000.

8. Formal daycare expenditures are for 2001.

9. Recent legislation introduced a paid parental leave of 12 weeks with full pay up to a cap corresponding approximately to the minimum wage.

Source: For public expenditures on childcare (i.e. formal day care and pre-primary school): OECD Education database; OECD social expenditures database; Eurostat; various sources (see Appendix 1 for details). For child benefits: OECD database "Taxing Wages". For parental leave:

Gauthier and Bormik (2001) and "Social Security Programs Throughout the World" from the United States Social Security Administration (see Appendix 1 for details).

Table 6. **Percentage of employed women in part-time jobs (age 25-54) and Tax incentives to share market work within the couple, 1999**

	Percentage of employed women age 25-54 in part time employment ¹	Increase in household disposable income when earnings are split 100/33 instead of 133/0 ²
Australia ^{3,4}	38.3	5.8
Austria	26.2	6.4
Belgium	37.1	1.9
Canada	22.3	4.8
Czech Republic	4.0	0.9
Denmark	15.1	2.8
Finland	9.5	10.6
France	23.5	-0.3
Germany	34.3	0.5
Greece	13.3	4.8
Hungary	4.4	6.0
Iceland	31.3	1.9
Ireland	32.1	3.2
Italy	23.8	6.3
Japan ^{3,5}	39.2	-0.1
Korea ³	9.2	1.8
Luxembourg	29.2	2.8
Mexico	27.0	11.0
Netherlands ⁶	54.3	-1.1
New Zealand	34.1	4.6
Norway	30.7	3.7
Poland ³	16.5	0.9
Portugal	11.1	2.8
Slovak Republic	2.7	..
Spain	15.7	-0.3
Sweden	19.0	6.8
Switzerland ⁴	47.4	1.9
Turkey	14.5	-1.5
United Kingdom	38.6	8.1
United States ⁷	13.0	0.0
Unweighted average	23.9	3.3

1. Part-time employment refers to persons who usually work less than 30 hours per week in their main job. Data include only persons declaring usual hours.

2. 100/33 refers to a situation where the husband earns 100 per cent of APW and the wife 33 per cent of APW; 133/0 refers to a situation where the husband earns 133 per cent of APW and the wife has no earnings.

3. Part-time data are based on actual hours worked. For Poland until 2000 only.

4. Part-time employment based on hours worked at all jobs.

5. Part-time employment is defined as less than 35 hours per week.

6. If account is taken that the husband has to buy private health insurance when he earns 133 per cent of APW, while his income falls below the income limit for the mandatory health care insurance when the household income is split (into a wage of 100 per cent of APW for the husband and 33 per cent for the wife), the tax incentive to share market work between spouses amounted to 6.9 per cent in 1999, and to 10.2 per cent after the 2001 tax reform.

7. The share of part-time in employment is for wage and salary workers only.

Sources: OECD Labour Market Statistics; OECD database "Taxing Wages"; OECD Tax Models.

Table 7. **Part-time employment by reasons, 2001**

Percentage of the women in part-time employment

	Could not find a full-time job	Did not want a full-time job	In education or training	Own illness or disability	Other reason given	No reason given	Look after children or adult
Austria	9.7	16.5	3.8	1.1	25.1	..	43.8
Belgium	18.2	8.6	0.8	1.8	43.8	..	26.8
Denmark	14.8	59.0	23.5	2.3	..	..	..
Finland	35.9	22.5	24.9	2.4	4.3	..	9.6
France	22.7	67.0	5.8	4.5	..	..	..
Germany	11.2	16.2	4.6	2.0	..	3.5	62.5
Greece	43.9	36.4	..	..	13.3	..	..
Iceland	7.7	52.5	22.7	4.5	9.8	..	..
Ireland	9.9	73.6	13.0	..	..	2.6	..
Italy	30.4	28.1	2.8	1.1	31.6	6.0	..
Luxembourg	..	55.5	..	..	15.3	..	12.2
Netherlands	2.0	72.9	9.5	1.1	0.9	6.0	7.5
Norway	8.9	62.9	17.2	3.0	..	7.9	..
Portugal	19.7	20.0	4.1	16.5	26.5	..	13.2
Spain	21.2	10.5	4.9	..	50.5	0.9	11.7
Sweden ¹	23.5	52.3	10.4	7.0	6.2	..	..
Switzerland	3.1	19.8	7.1	3.0	14.5	-0.5	52.1
United Kingdom	6.8	15.6	10.8	1.7	19.1	0.3	45.7
EEA	13.4	32.7	7.5	2.4	11.1	2.2	30.8
EUR-12	15.2	36.1	5.6	2.4	9.2	2.9	28.7
EU-15	13.4	32.1	7.3	2.4	11.3	2.1	31.4

1. 2000 data for Sweden.

Non-responses to the variable "Full-time/Part-time distinction" not considered.

Source: European Labour Force Survey 2001.

Table 8. **Econometric estimates of the determinants of female labour force participation (women 25-54 years old), OECD 1985-1999**

(Two-stage least squares with heteroskedasticity-consistent standard errors)

Dependent variable:	Model I:	Model II:	
	Part-time as a regressor	Part-time as an endogenous variable	
	log (Total participation rate)	log (Full-time participation rate)	log (Part-time participation rate)
log (Part-time incidence)	0.21 (1.77)*		
log (Relative tax second-earner at 67% APW)	-0.22 (2.01)**	-0.29 (2.84)***	
log (Childcare)	0.05 (1.81)*	0.05 (3.65)***	
log (Paid leave)	0.11 (1.64)*	0.17 (2.47)**	
[log (Paid leave)] ²	-0.02 (1.84)*	-0.02 (2.06)**	
Tax incentives to part-time			0.04 (4.53)***
Child benefits	0.00 (0.17)		-0.03 (2.46)**
log (Employment protection legislation)	0.02 (1.37)		0.07 (2.60)**
log (Product market regulation)	0.03 (1.51)		
log (Male unemployment rate)	0.10 (2.95)***	0.14 (5.34)***	-0.17 (2.58)**
log (Female unemployment rate)	-0.17 (4.28)***	-0.21 (6.74)***	0.22 (3.64)***
log (Education)	0.51 (4.00)***	0.74 (6.01)***	-0.31 (2.05)**
log (Number of children per woman)	-0.18 (0.83)		-1.78 (8.57)***
log (Proportion married)	-0.08 (0.63)		
Observations	129	123	256
Adjusted R-squared	0.99	0.99	0.95

1. Absolute value of t-statistics in parentheses. * significant at 10% level, ** significant at 5% level, *** significant at 1% level.

2. Country fixed effects are included. See Section 4 for details on the specifications and estimation procedures.

Source: OECD estimates.

Table 9. **Sensitivity tests of the effects of taxation of second-earners and public expenditures on childcare, OECD 1985-1999**

(Two-stage least squares with heteroskedasticity-consistent standard errors)

Dependent variable: log (full-time participation rate of women 25-54 years old)	Alternatives			
	Basic model	1	2	3
log (Relative tax second-earner at 67% APW)	-0.29 (2.84)***			-0.22 (2.23)**
log (Childcare)	0.05 (3.65)***	0.05 (3.43)***	0.05 (3.42)***	
log (Paid leave)	0.17 (2.47)**	0.18 (2.55)**	0.16 (2.23)**	0.12 (1.56)
[log (Paid leave)] ²	-0.02 (2.06)**	-0.02 (2.10)**	-0.02 (1.79)*	-0.01 (1.2)
log (Tax single individual at 67% APW)		0.31 (3.02)***		
log (Tax second-earner at 67% APW)		-0.27 (2.78)***		
log (Relative tax second-earner at 100% APW)			-0.25 (2.05)**	
log (Formal daycare)				0.02 (2.21)**
log (Pre-primary school)				-0.01 (0.46)
Observations	123	123	123	123
Adjusted R-squared	0.99	0.99	0.99	0.99

1. Absolute value of t-statistics in parentheses. * significant at 10% level, ** significant at 5% level, *** significant at 1% level.

2. See Section 4 for details on the specifications and estimation procedures. Although control variables were included as in Model II (Table 8), their coefficients are not reported here.

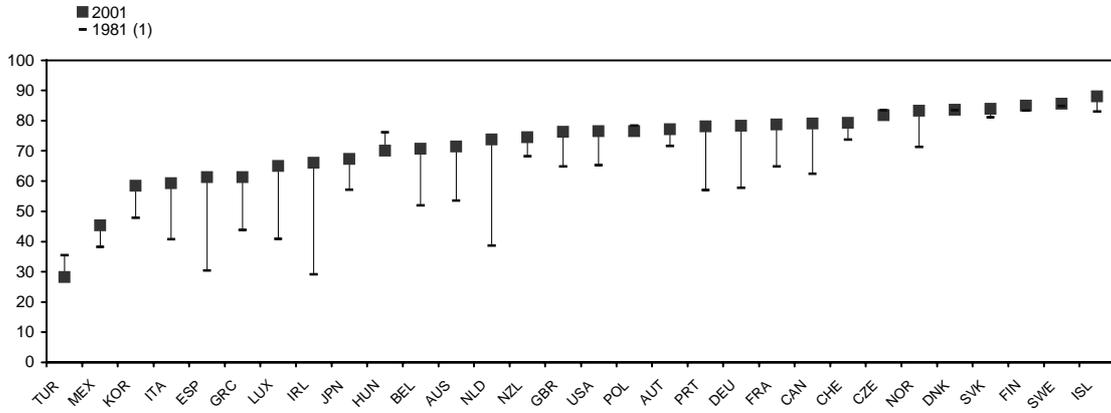
3. Alternative 1 decomposes the relative average tax rate of second-earners and single individuals earning 67 per cent of APW into their respective average tax rates.

Alternative 2 tests the effect of the relative average tax rates of second-earners and single individuals at earnings of 100 per cent of APW instead of 67 per cent. Finally, alternative 3 splits public spending on childcare into formal daycare and pre-primary school spending per child of the relevant age category.

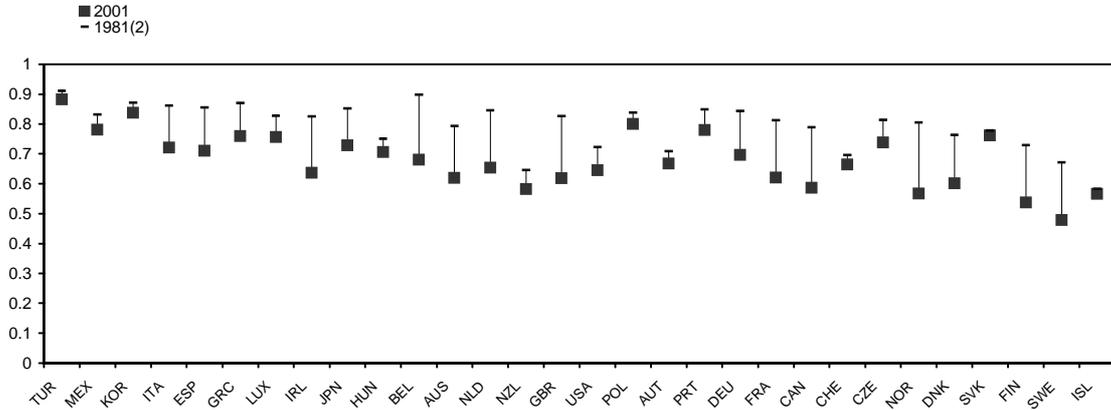
Source: OECD estimates.

Figure 1. Factors behind the trend increase in female participation rates, 1981-2001

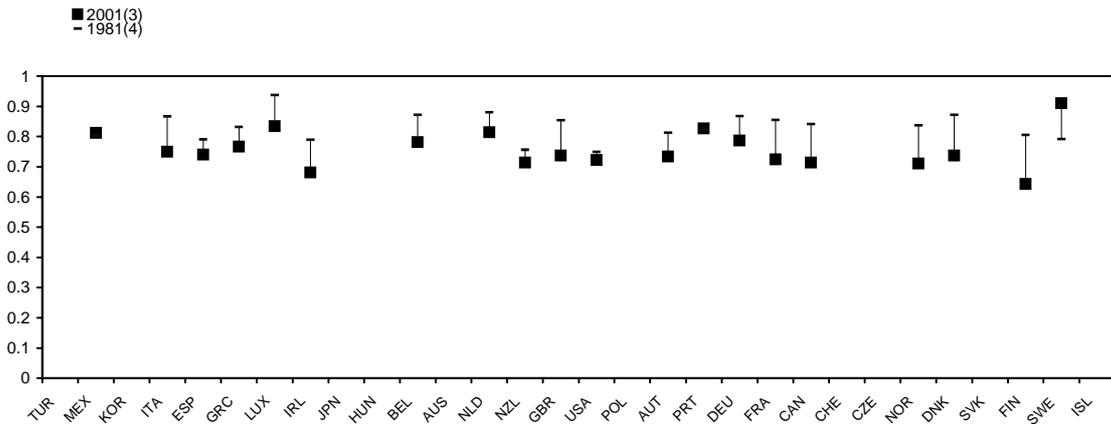
Panel A. Female labour force participation rate (age 25-54)



Panel B. Percentage of married women (age 25-54)



Panel C. Percentage of women in couples (age 25-54)



1. 1983 for Greece and Luxembourg, 1986 for New Zealand, 1988 for Turkey, 1991 for Switzerland, Iceland, and Mexico, 1992 for Hungary and Poland, 1993 for the Czech Republic, 1994 for Austria and the Slovak Republic.

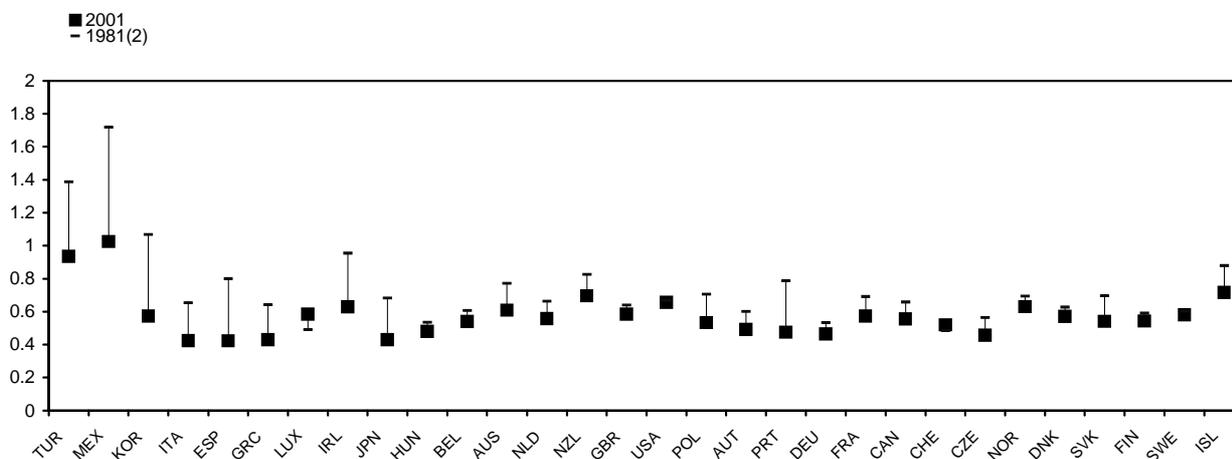
2. 1986 for Portugal. 1995 for Austria, Czech Republic, Hungary, Iceland, New Zealand, Poland and Switzerland. 1999 for Slovak republic.

3. 1998 for Norway.

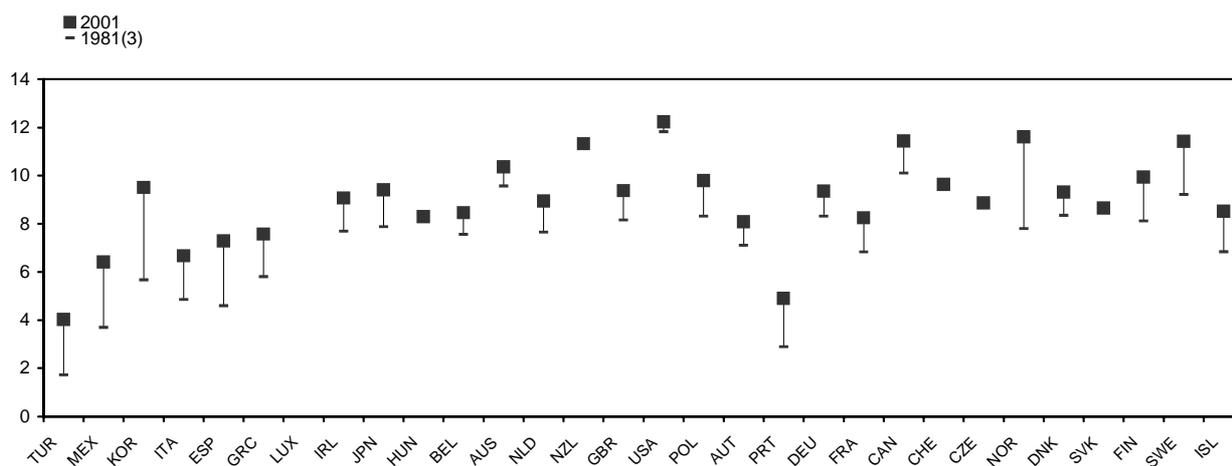
4. 1984 for Canada, 1994 for Belgium, Ireland, Portugal and Spain, 1995 for Austria, Luxembourg and New Zealand.

Source: OECD Labour Market Statistics; UN demographic yearbook, European Community Household Panel, and Kiernan (1996).

Figure 1. Factors behind the trend increase in female participation rates, 1981-2001 (continued)

Panel D. Number of children age 0-14 per woman age 15-64¹

Panel E. Average years of education of women age 25-54



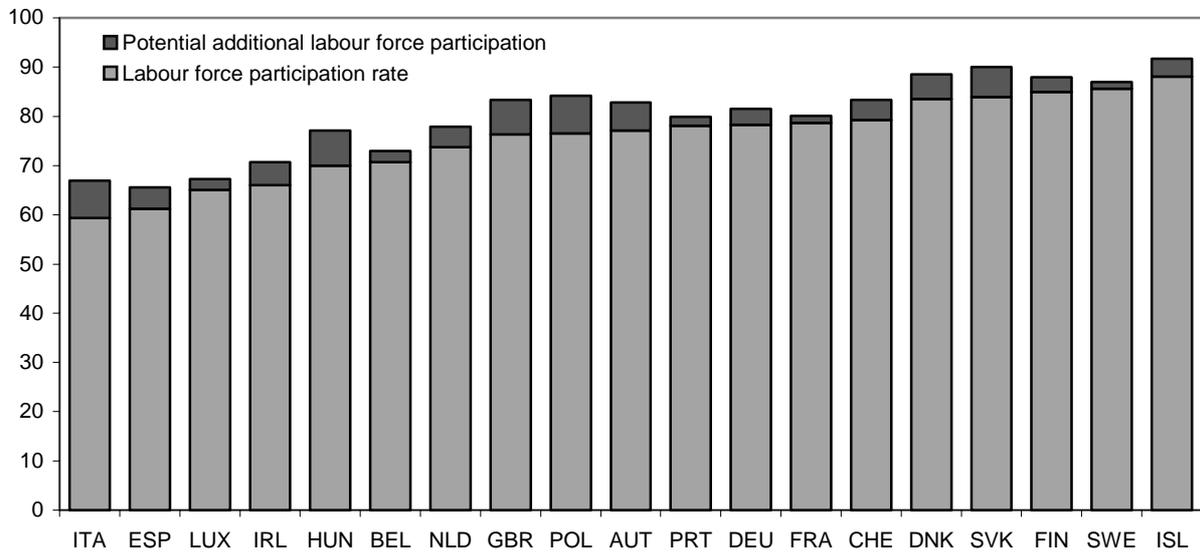
1. The number of children currently aged 0-14 years is divided by the number of women aged 15-64 years rather than the number of prime-age women (25-54 years old), because some of these children are cared for by mothers 15-24 years old (and possibly a few mothers 55-59 years old).

2. 1986 for Greece, 1987 for Ireland, 1988 for Luxembourg, 1990 for Switzerland, 1994 for the Czech Republic, Hungary, Poland and the Slovak republic.

3. 1990 for the Czech republic and the Slovak Republic.

Sources: For demographic data: UN World Population Prospects 1950-2050 (The 2000 revision). For education data: Barro and Lee (2000).

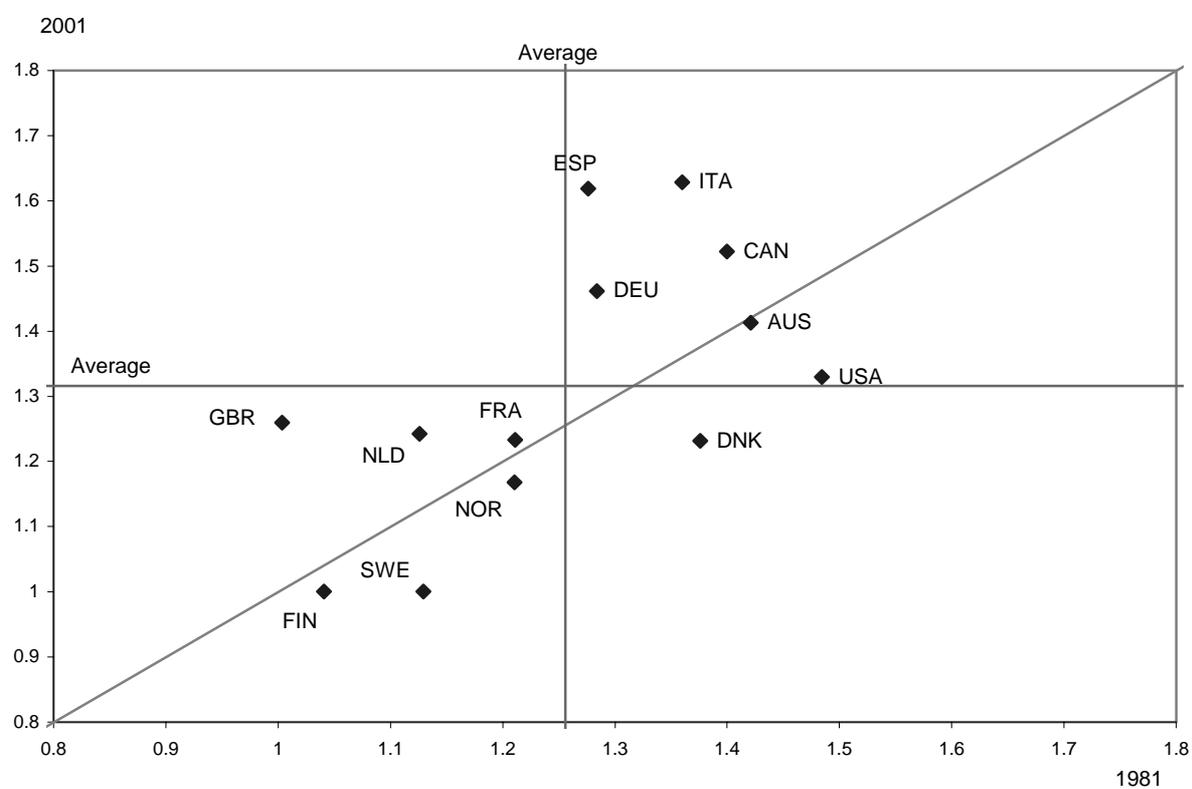
Figure 2. Volitional estimate of potential participation of women aged 25-54 years, 2001¹
(percentages)



1. The potential additional labour force participation reflects the currently inactive women aged 25-54 years that indicate they would like to have work (see Table 3).

Source: European Labour Force Survey 2001.

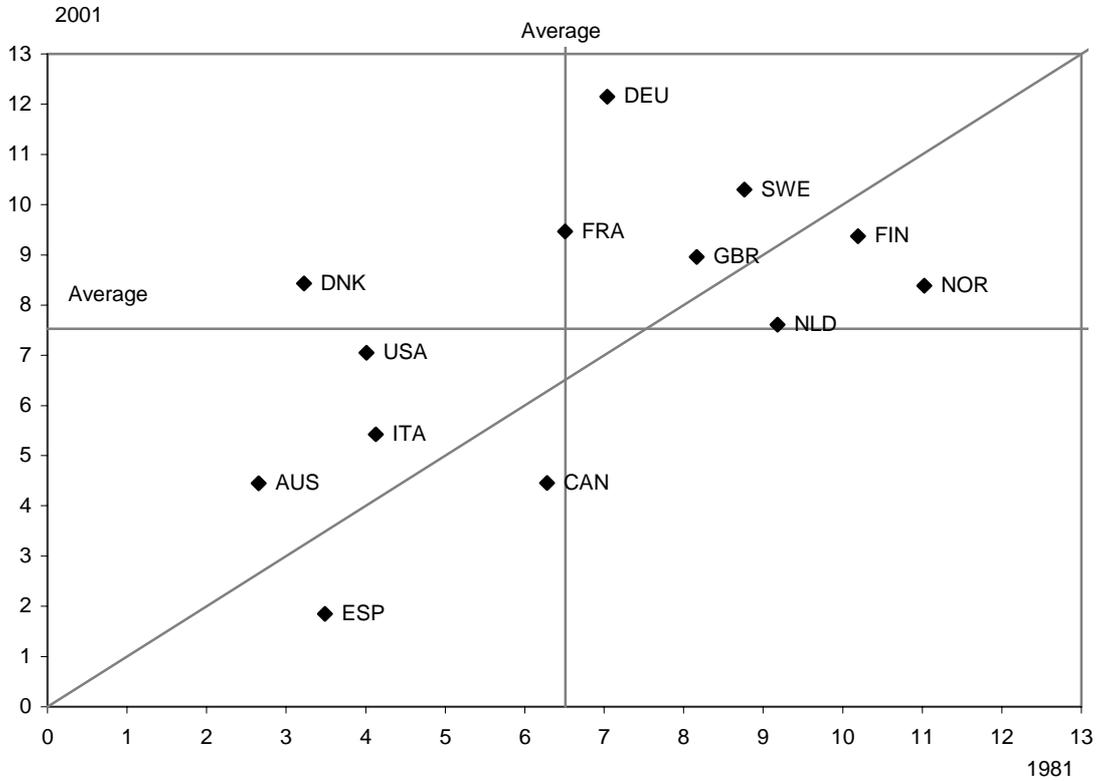
Figure 3. Evolution of the relative tax rate of second earners and single persons (for earnings of 67 per cent of APW), 1981-2001



1. The relative tax rate of second earners and single persons is the ratio of the average tax rates on a second earner and on a single individual earning 67 per cent of APW. See Table 4 and Appendix 1 for details.

Source: OECD database "Taxing Wages"; "The OECD jobs study: Taxation, Employment, and Unemployment" (OECD, 1995).

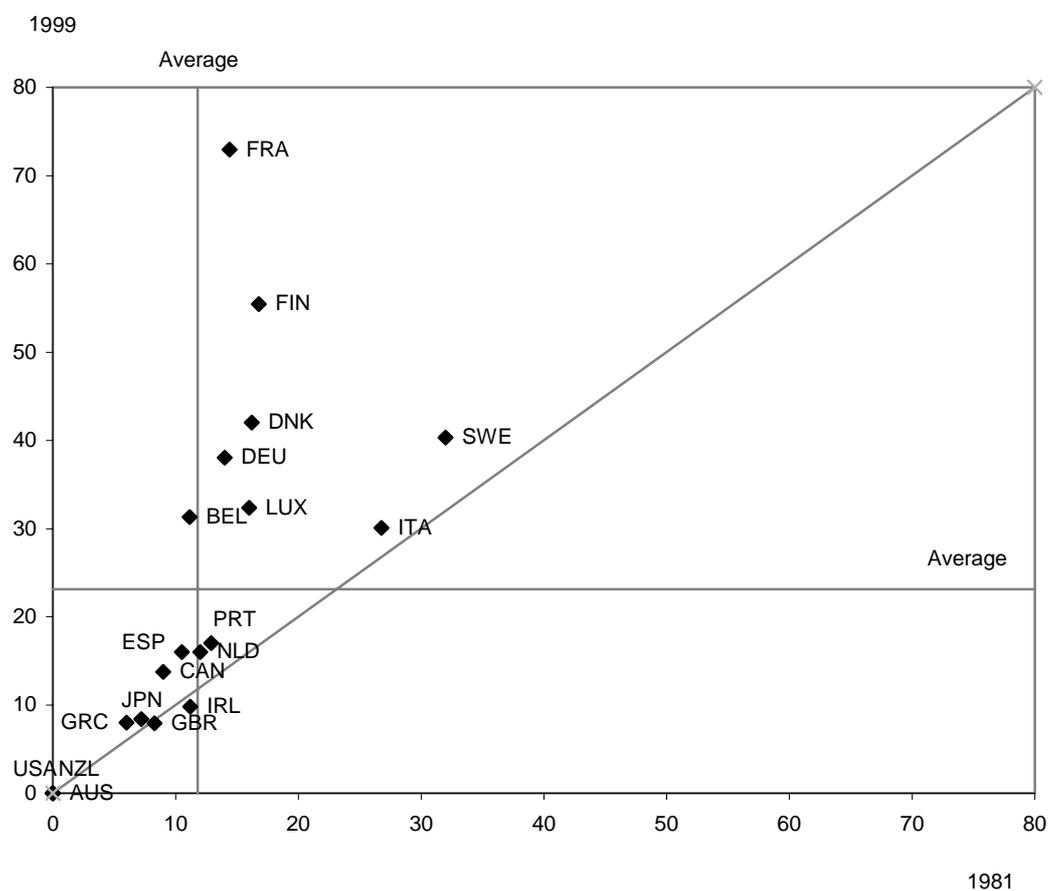
Figure 4. Evolution of child benefits measured as the percent increase in disposable income for two children, 1981-2001 ¹



1. The husband is assumed to earn 100 percent of APW, and the wife 33 percent of APW. See Appendix 1 for details.

Source: OECD database "Taxing Wages"; "The OECD Jobs Study: Taxation, Employment and Unemployment" (OECD, 1995)

Figure 5. Evolution of paid parental leaves measured in maximum number of paid leave weeks, 1981-1999^{1,2}

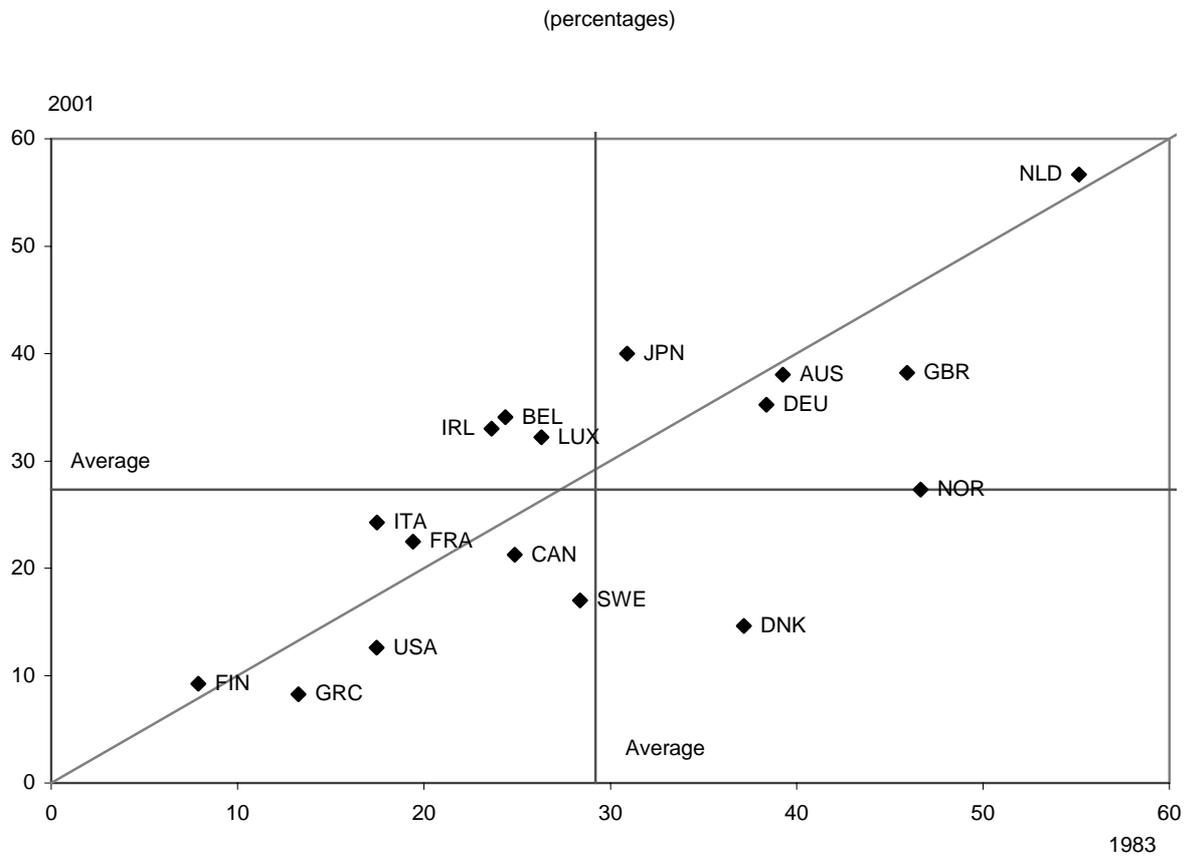


1. Parental leave includes maternity, parental, and childcare leaves.

2. The number of paid leave weeks is calculated by weighting the leave weeks by the corresponding income replacement rate. The latter is the statutory replacement rate and does not take into account means-tests nor private negotiated arrangements that top up legislated provisions. Leave reserved for the father is not included.

Sources: Gauthier and Bortnik (2001) and "Social Security Programs Throughout the World" from the United States Social Security Administration. See Appendix 1 for details.

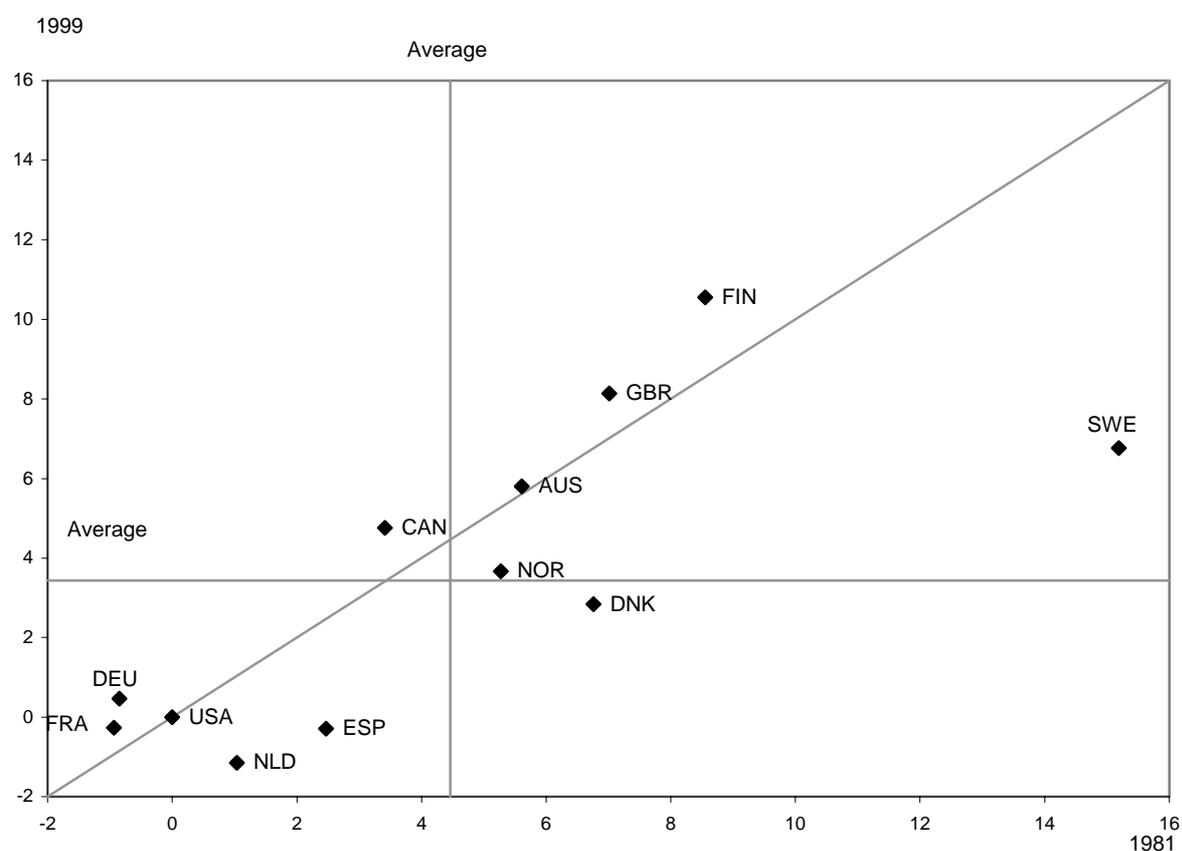
Figure 6. Evolution of the proportion of women aged 25-54 in part-time jobs, 1983-2001



1. See notes to Table 6.

Source: OECD Labour Market Statistics.

Figure 7. Evolution of tax incentives for part-time work measured as increase in disposable income when household earnings are split 100/33 instead of 133/0, 1981-2000 ^{1,2}



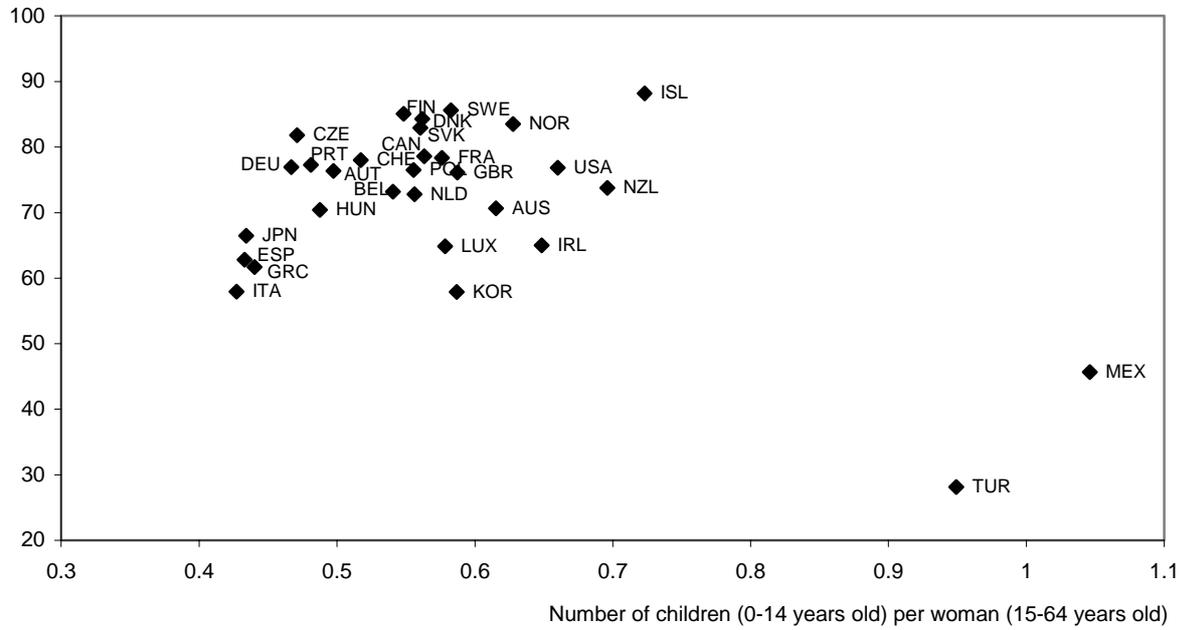
1. 100/33 refers to a situation where the husband earns 100 per cent of APW and the wife 33 per cent of APW; 133/0 refers to a situation where the husband earns 133 per cent of APW and the wife has no earnings.

2. For the Netherlands, if account is taken that the husband has to buy private health insurance when he earns 133 per cent of APW, while his income falls below the income limit for the mandatory health care insurance when the household income is split (into a wage of 100 per cent of APW for the husband and 33 per cent for the wife), the tax incentive to share market work between spouses amounted to 6.9 per cent in 1999, and to 10.2 per cent after the 2001 tax reform.

Source: OECD database "Taxing Wages"; "The OECD Jobs Study: Taxation, Employment and Unemployment" (OECD, 1995); OECD Tax models.

Figure 8. Female participation and fertility, 2000

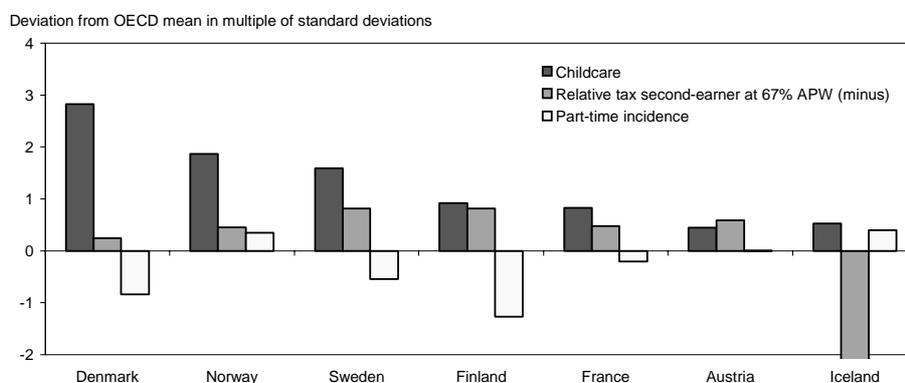
Female participation rate (25-54 years old)



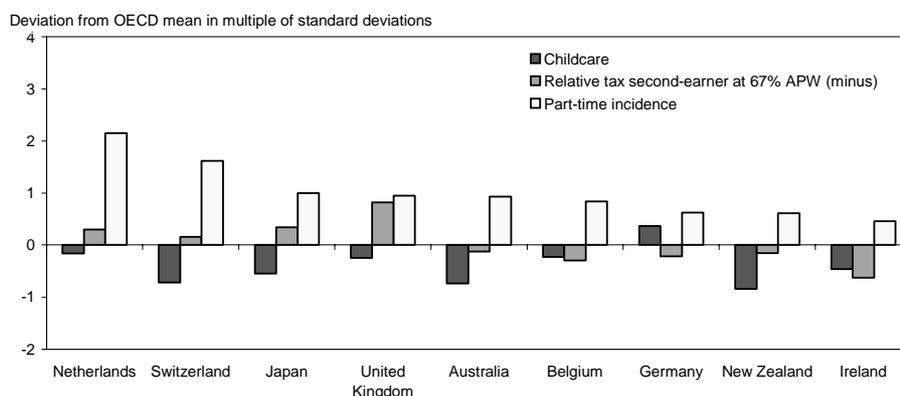
Sources: see Figure 1.

Figure 9. Policy mixes, 1999 ^{1,2}

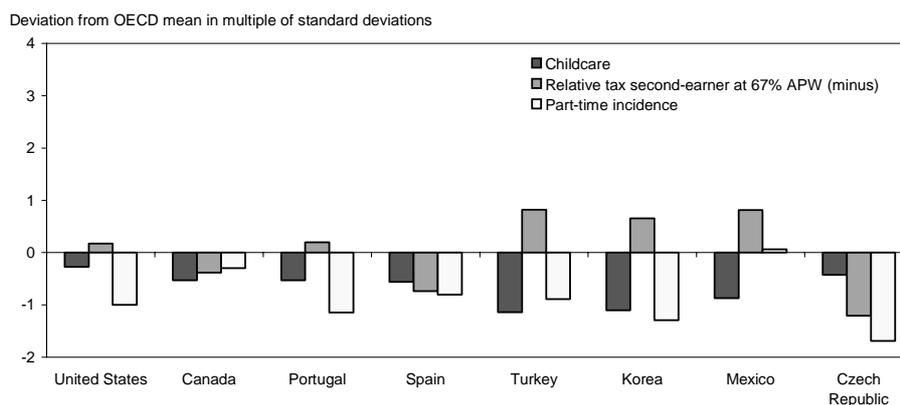
Panel A. Nordic countries, France, and Austria



Panel B. Northern Europe and Pacific countries



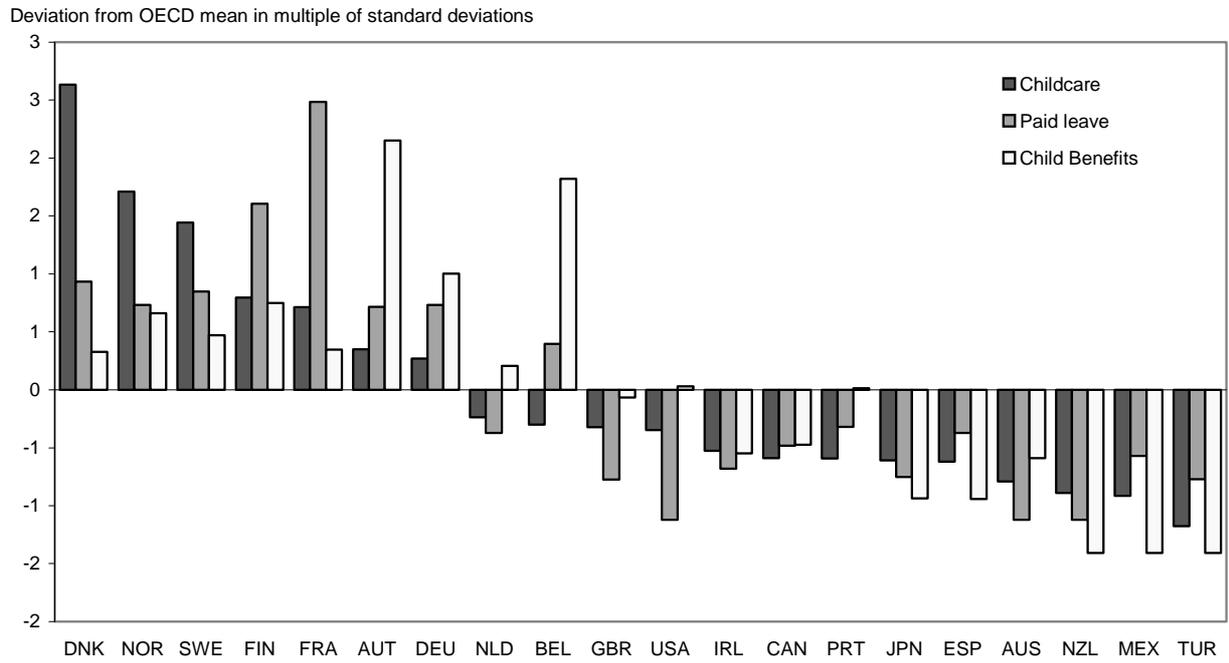
Panel C. United States, Canada, and lower-income per capita countries



1. The incidence of part-time is not in itself a policy variable, but may reflect to some extent policies which discourage or encourage part-time and full-time work.
 2. "Childcare" designates public childcare spending per child (including formal day care and preprimary school); "Relative tax" is the relative average tax rates of second-earners and single persons at an earnings level of 67 per cent of APW; and "Part-time incidence" denotes the proportion of employed women aged 25-54 years who are in part-time jobs. The deviations of relative tax from the mean are represented with a minus sign. Thus a high positive value reflects a relatively favourable tax treatment of second-earners.

Sources: See Tables 4, 5, and 6.

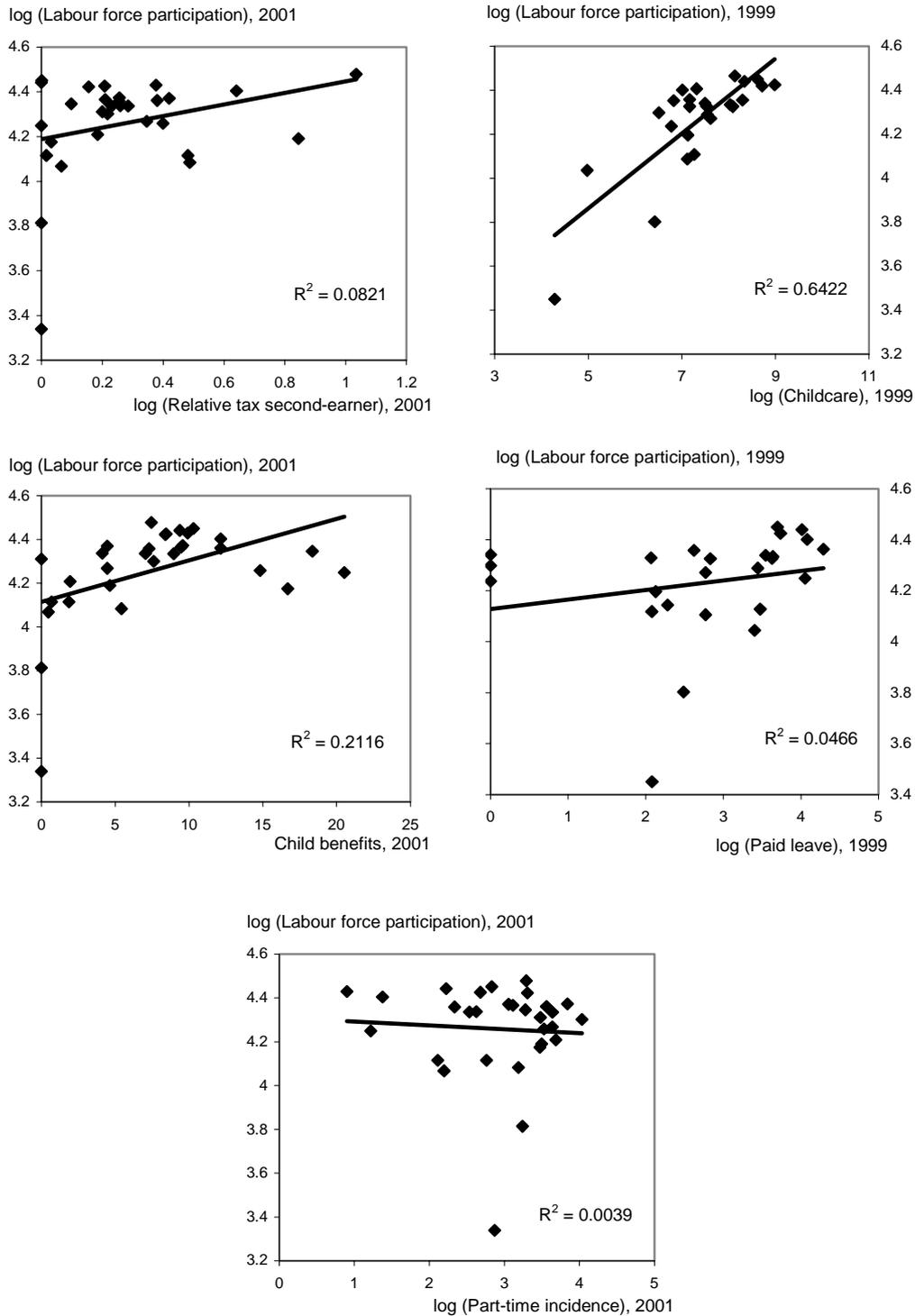
Figure 10. **Composition of childcare support, 1999¹**



1. "Childcare" designates public childcare spending per child (including formal daycare and pre primary school) ; Paid leave is the maximum number of paid maternity, parental and childcare leave a woman is entitled to; and Child benefits is the increase in disposable income from child benefits for 2 children in a family where the husband earns 100 per cent of APW and the wife 33 per cent.

Source: See Table 5.

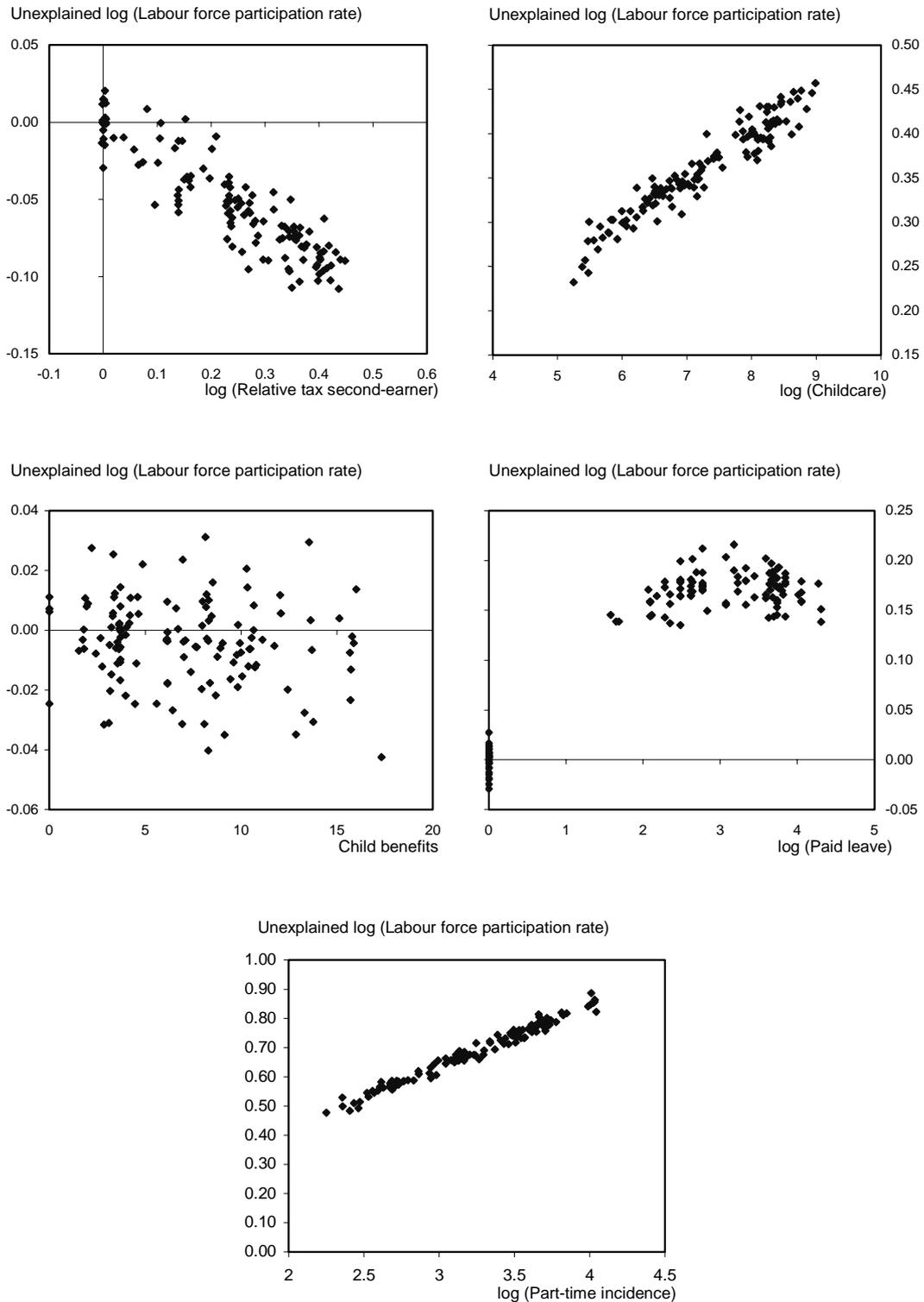
Figure 11. Simple correlations between labour force participation of women aged 25-54 years and selected variables, latest available year¹



1. The relative tax of the second-earner is calculated at an earnings level of 67 per cent of APW.

Source: see Tables 4, 5, and 6.

Figure 12. Partial correlations between labour force participation of women aged 25-54 years and selected variables, all available years^{1,2}



1. The partial correlations are based on the estimation of Model I reported in Table 8.
 For an explanation of the methodology, see Appendix 2.
 2. The relative tax of the second-earner is calculated at an earnings level of 67 per cent of APW.

Source: OECD estimates.

Figure 13. Contributions of explanatory variables to female participation in percent deviation from OECD mean, 1999^{1,2}

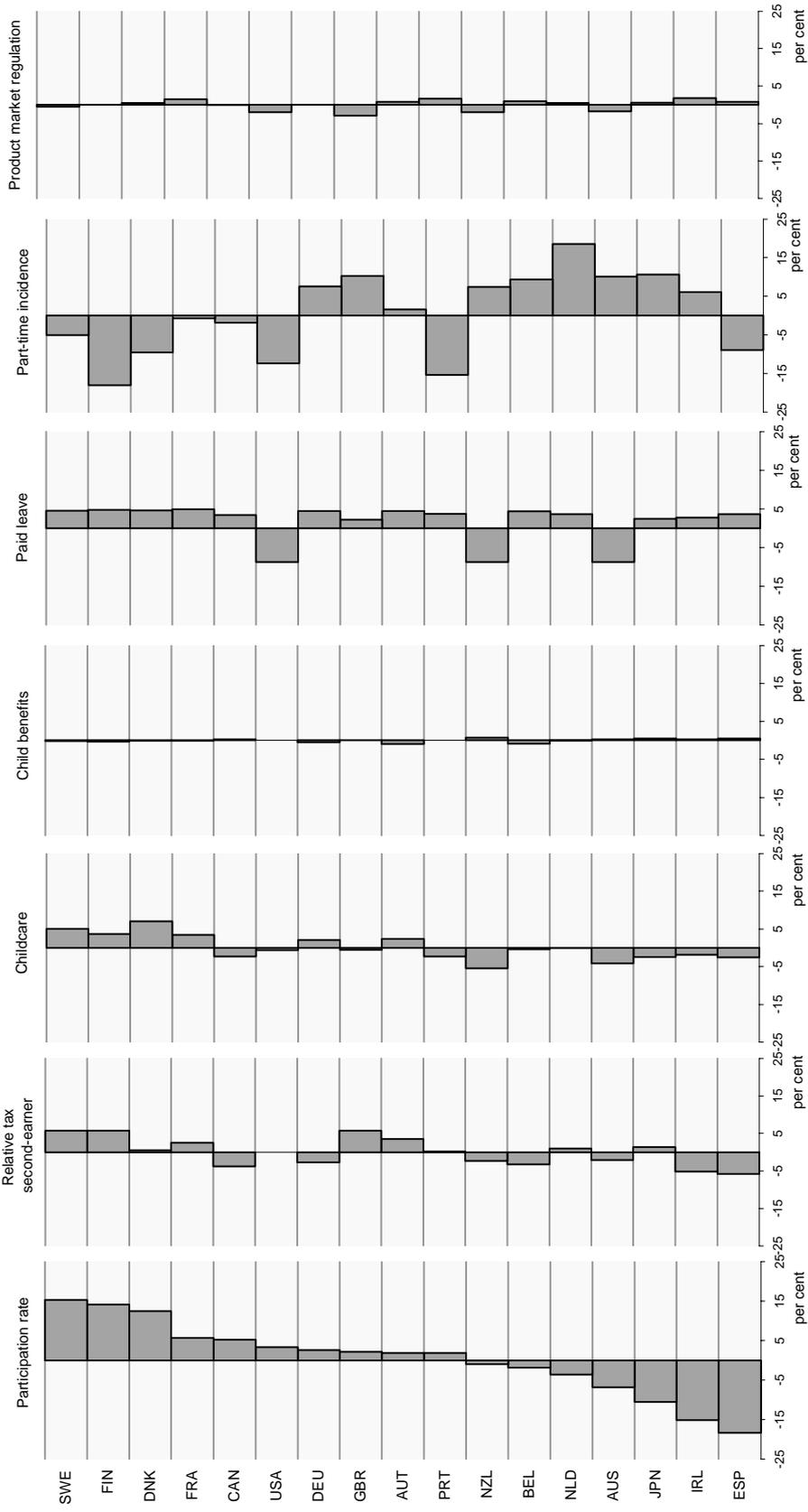
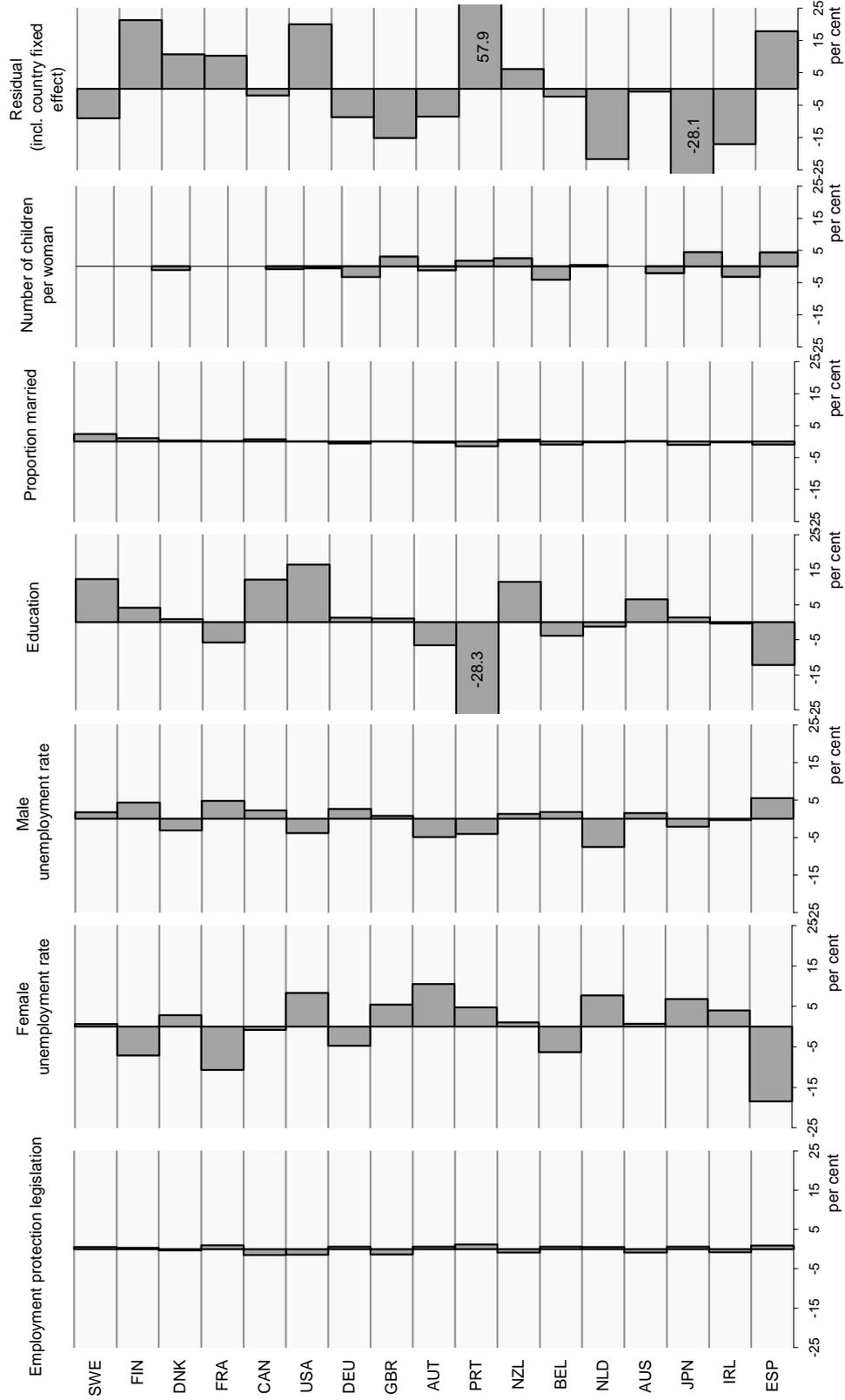


Figure 13. Contributions of explanatory variables to female participation in percent deviation from OECD mean, 1999^{1,2} (continued)



1. The calculation of contributions is based on model 1 in Table 8. Due to the logarithmic character of the econometric specification, the OECD mean refers to the geometric mean, and contributions are measured in percent deviation from this mean and are additive in a multiplicative way. See Appendix 2 for more details on the calculations of the contributions.
 2. The relative tax rate of second-earners is calculated at an earnings level of 67 per cent of APW. The variables "Child benefits", "Product market regulation", "Employment protection legislation", "Proportion married", and "Number of children per woman" were not significant at conventional levels.
 Source: OECD estimates.

Figure 14. Policy contributions to full-time and part-time participation, 1999^{1,2}

Panel A. Full-time participation

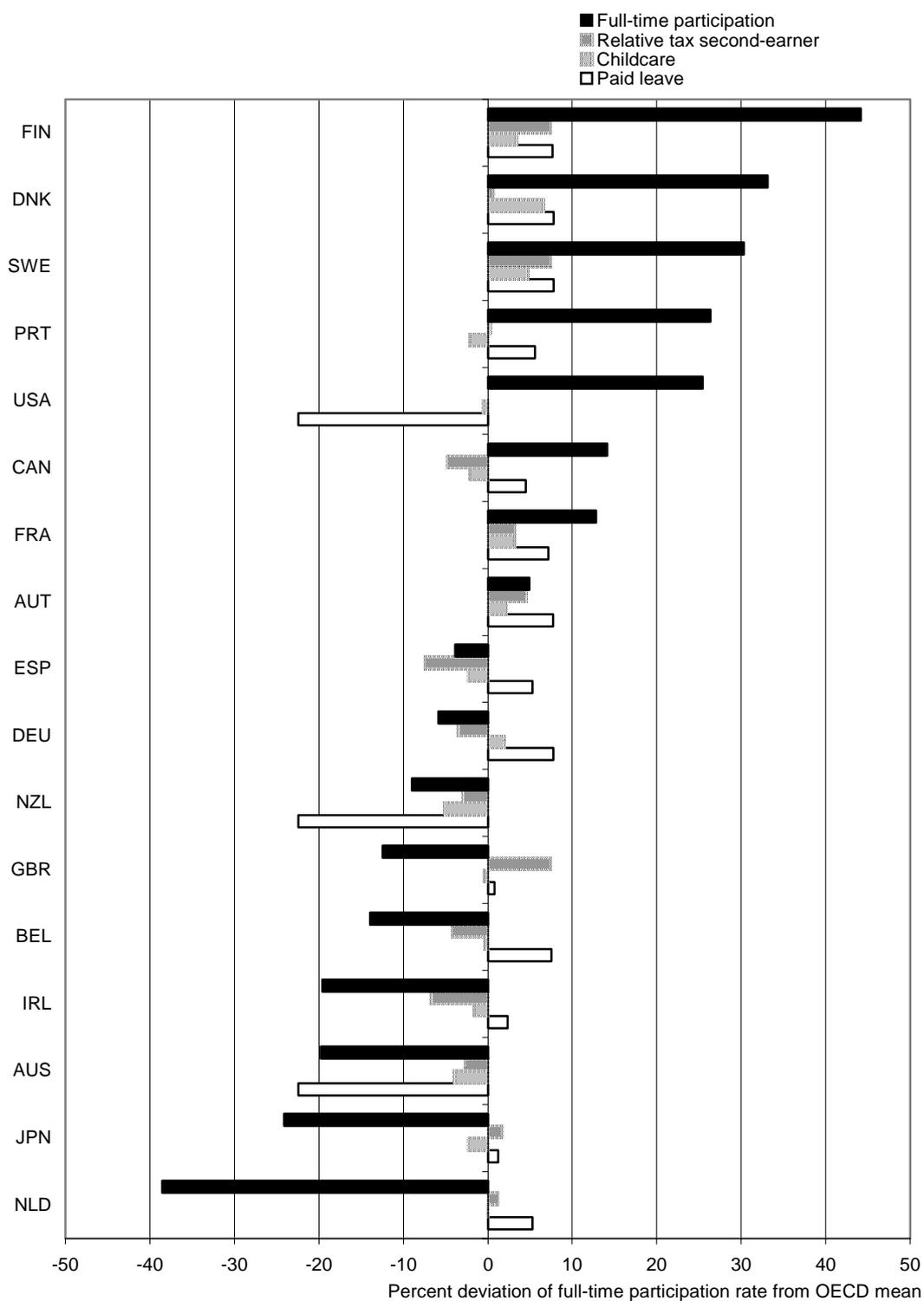
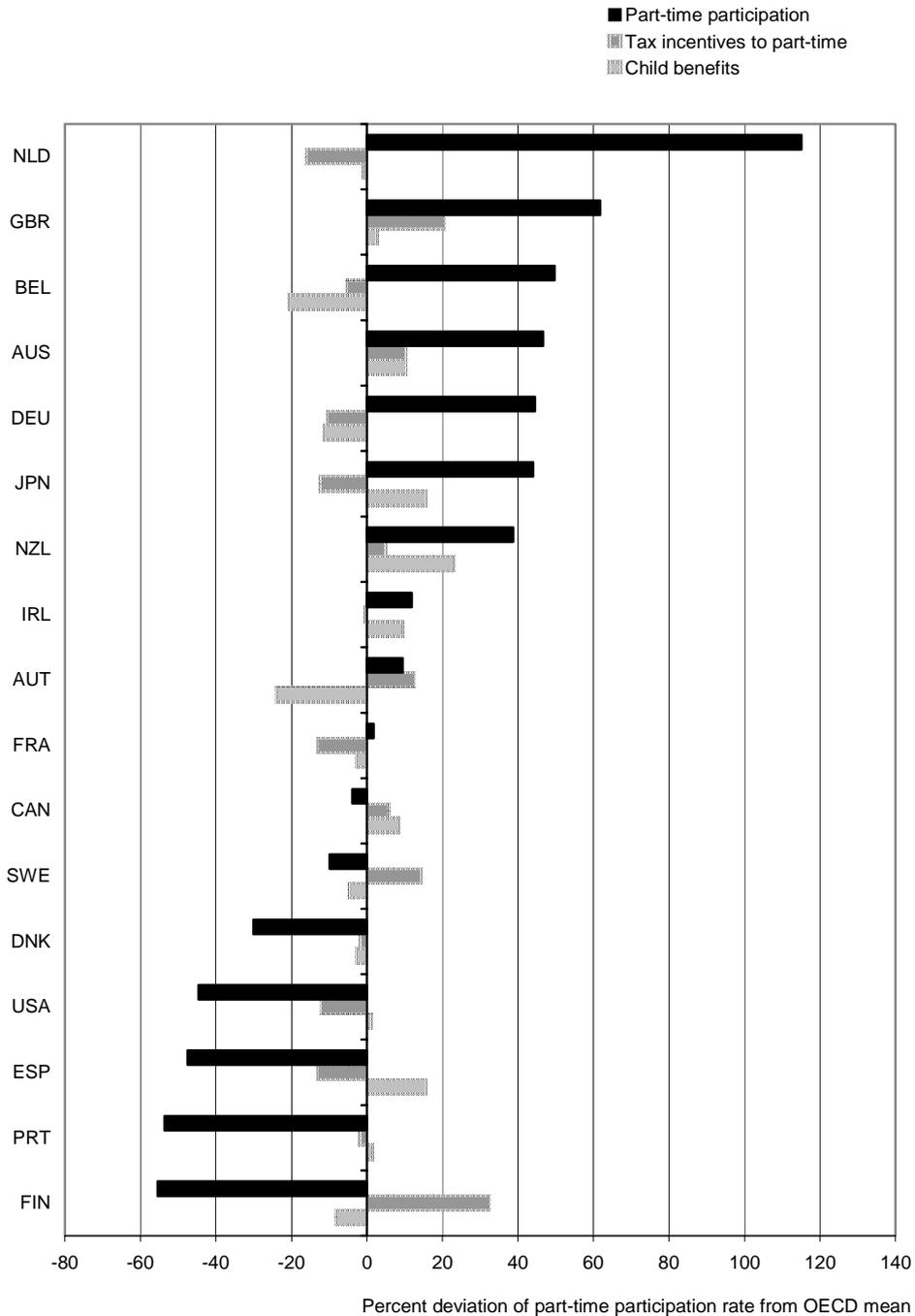


Figure 14. Policy contributions to full-time and part-time participation, 1999^{1,2} (continued)

Panel B. Part-time participation



1. The calculation of contributions is based on model II in Table 8. Due to the logarithmic character of the econometric specification, the OECD mean refers to the geometric mean, and contributions are measured in percent deviation from the OECD mean. See Appendix 2 for more details on the calculation of the contributions.

2. The relative tax rate of second-earners is calculated at an earnings level of 67 per cent of APW.

Source: OECD estimates.

APPENDIX 1: DEFINITION AND SOURCES OF DATA FOR VARIABLES USED TO CHARACTERISE POLICIES AFFECTING FEMALE LABOUR SUPPLY

A1.1 Tax data

Data sources

The two main sources of data on family taxation are the OECD publications “Taxing Wages” (for 1995 and later years) and “The OECD Jobs Study: Taxation, Employment and Unemployment” (OECD, 1995) (for 1981, 1985, 1989, and 1992). The latter only covers fifteen countries (Australia, Belgium, Canada, France, Germany, Denmark, Finland, Italy, Japan, the Netherlands, Norway, Spain, Sweden, the United Kingdom, and the United States). Several corrections had to be made to reconcile both series.

- The data from the OECD Jobs Study are not perfectly comparable with those of Taxing Wages, because they do not net tax rates from universal cash benefits. Hence, they were corrected for universal cash benefits using information from the OECD publications “The tax/benefit position of employees” and “The tax/benefit position of production workers” (earlier versions of Taxing Wages) for various years.
- Tax data for Belgium in the OECD Jobs Study are based on an outdated APW earnings series. The tax wedge between second earners and single individuals (at 67 per cent and 100 per cent of APW) was reconstructed for 1989 and 1992 using information from the OECD publications “The tax/benefit position of employees” and “The tax/benefit position of production workers”. Data from the OECD Jobs Study for earlier years (1981 and 1985) were not used.
- Data for Japan from the OECD Jobs Study are not comparable with those from Taxing Wages for later years (due to some change in calculations) and were not used.
- Data from Taxing wages had to be completed by simulations based on the OECD “Tax models” (which are used to produce the data in Taxing Wages) for some family situations not included in the publication’s tables (*e.g.*, husband and wife both earning 100 per cent of APW with two children).

Data for missing years were interpolated.

Definitions

Tax wedge between second earner and single individual at 67 per cent and 100 per cent of APW

The tax rate on the second earner is defined as the share of her earnings which goes into paying additional household taxes and is calculated as follows:

$$\text{Tax second earner} = 1 - \frac{(\text{Household Net Income})_B - (\text{Household Net Income})_A}{(\text{Household Gross Income})_B - (\text{Household Gross Income})_A},$$

where A denotes the situation in which the wife does not earn any income and B denotes the situation in which the wife's gross earnings are 67 per cent (100 per cent respectively) of APW. It is assumed that the second-earner's husband earns 100 per cent of APW and that the couple has two children. The difference between gross and net income includes income taxes, employee's social security contribution, and universal cash benefits.

The same formula applies to calculate the tax rate of a single individual (*Tax single individual*), although in this case the household is only made up of the individual. Household gross income is assumed to be zero in the case where the individual does not work in the labour market.

Means-tested benefits based on household income are not included (apart from some child benefits that vary with income) due to lack of time-series information. They are less relevant at levels of household income above 100 per cent of APW. However, the omission of these benefits may lead to under-estimate the effective tax rate of the single individual, as he/she may lose social assistance and other means-tested benefits if he/she decides to work.

The tax wedge (*Relative tax second earner*) is calculated as the ratio of *Tax second earner* and *Tax single individual*.

Child benefits (including tax allowances)

The child benefits index is defined as the increase in household disposable income from child benefits for two children, at a gross earnings level of 133 per cent of APW (of which 33 per cent is earned by the wife). It is calculated as follows:

$$\text{Child Benefits} = \frac{(\text{Household Net Income})_B - (\text{Household Net Income})_A}{(\text{Household Net Income})_A},$$

where A denotes a household earning 133 per cent of APW without children, and B denotes a household earning 133 per cent of APW with two children.

Tax incentives to part-time

The incentives to share market work between spouses are measured by the increase in household disposable income between a situation where the husband earns the entire household income (133 per cent of APW), and a situation where husband and wife share earnings (100 per cent and 33 per cent of APW respectively). The couple is assumed to have two children. Denoting the first scenario by A, and the second by B, the calculation is simply:

$$\text{Tax incentives to part-time} = \frac{(\text{Household Net Income})_B - (\text{Household Net Income})_A}{(\text{Household Net Income})_A}.$$

A1.2 Public spending on childcare

Formal day care

The main data source is the OECD "Social Expenditures Database" (henceforth SOCX). This data does not include tax expenditures (*i.e.*, tax allowances and tax credits for childcare expenses) unless if they are refundable. In English-speaking countries where this type of expenditures is likely to be more important (*e.g.* Canada and the United States below), they constitute 20-25 per cent of spending on formal day care, but only about ten per cent of spending on childcare (*i.e.*, formal day care and pre-primary school), the

main indicator used in this paper. To maintain comparability across countries, this type of expenditures is not included.

For some countries for which data is missing or seems implausible, data is taken from another source or an estimate is constructed. Details are given below for the concerned countries.

Austria: Figures from SOCX appear quite high compared to data from the “Social Protection Expenditures Database” of Eurostat and data from the recent publication “Babies and bosses – Reconciling work and family life (Volume 2): Austria, Ireland, and Japan” (OECD, 2003b). Data from Eurostat (which provides a time series) is used instead.

Canada: In the absence of data from SOCX, an estimate was constructed for 1992-2000 based on data provided in “Early Childhood Education and Care in Canada 2001” by Martha Friendly, Jane Beach, and Michelle Turiano (2002). The estimate is based on provincial allocations for regulated child care spaces. The main source of federal spending is the childcare expense deduction (tax deduction for childcare expenses). Due to lack of comparable data on tax expenditures for other countries, it is not included. There is also some federal funding targeted to the aboriginal population, however it is small and not included.

Denmark: Figures from SOCX appear quite high compared to data from the “Social Protection Expenditures Database” of Eurostat and data from “Caring for Children and Older People – A Comparison of European Policies and Practices” by Tine Rostgaard and Torben Fridberg (1998) from the Danish National Institute of Social Research. There is some debate regarding the classification of some day care expenditures which are fully integrated into the school day. These are already included in the spending on pre-primary school (see below), and it is possible that they were also included in the SOCX data on childcare spending, leading to a higher figure in SOCX than in the other sources. Data from Eurostat is used instead, and data for years prior to 1990 is retroplated using the growth rate of the SOCX data.

France: Data before 1995 is not used because of two series breaks, one in 1989-90 with a reclassification of expenditures within family services, and the other in 1994-95 when the scope of general government was broadened to match the one used in national accounts.

Netherlands: In the absence of data from SOCX, data covering 1988 to 1995 is taken from Tine Rostgaard and Torben Fridberg (1998). This data is used in the econometric analysis. Data is also available for 2001 from the publication “Babies and Bosses – Reconciling Work and Family Life (Volume 1): Australia, Denmark, and the Netherlands” (OECD, 2002a), and is used for the comparison of the current state of policies across countries.

Japan: The only data available is for 2002 from a recent publication “Babies and bosses – Reconciling work and family life (Volume 2): Austria, Ireland, and Japan” (OECD, 2003b).

Sweden: The introduction of the new ESSPRO methodology in 1992-1993 induces a large decrease in formal day care spending. However, this is matched by a comparable increase in public spending on pre-primary school, so that the total spending on childcare should not be affected.

United Kingdom In the absence of data from SOCX, data for England covering 1983 to 1995 is taken from Tine Rostgaard and Torben Fridberg (1998). This data is used in the econometric analysis. Data is also available starting in 1999 from the “Social Protection Expenditures

Database” of Eurostat, and is used for the comparison of the current state of policies across countries.

United States: In the absence of data from SOCX, an estimate is constructed for the years 1981-2000 based on data from the USA Background Report for the OECD Thematic Review of Education and Care Policy, the Head Start Bureau, and the Green Book (various years). The estimate includes spending under the Child Care and Development Fund (including federal spending, state matching funds, and transfers under the Temporary Assistance for Needy Families Program), spending under the Social Services Block Grant, and spending under the Head Start/Early Head Start Program (state funding not included). Except for Head Start (0-5 years old), the age group covered by the spending is 0-14 years old (children 0-5 years old account for about two-thirds of the spending). Spending for special education grants/programs and food programmes is not included. Due to lack of comparable data for other countries, spending under the Child and Dependent Care Tax Credit and the Dependent Care Assistance Plan is not included.

Pre-primary school

The main data source is the OECD “Education Database”. Spending on pre-primary school includes both direct and indirect expenditures. Indirect expenditures (transfers and payments to private entities) were not recorded over the period 1985 to 1991. However, they are negligible in most countries over the period 1992-1999, and are thus set to zero for the earlier period. The exceptions are Denmark, New Zealand, Ireland, the Netherlands, and Spain, where indirect spending is projected for the earlier years based on their share in public spending over the period 1992-1999.

The following country notes apply:

Denmark: Spending on pre-primary education includes some spending on day care, for those day care activities which are fully integrated into the school day and are not costed separately.

Finland: Data prior to 1998 is not used because a change in methodology and coverage induces a series break. Starting in 1998, the estimated kindergarten expenditure on day care and child care for three to six-years-olds is excluded from spending on pre-primary school.

Sweden: The introduction of the new ESSPRO methodology in 1992-1993 induces a large decrease in formal day care spending, however this is matched by a comparable increase in public spending on pre-primary school, so that the total spending on childcare should not be affected.

United States: Pre-primary education only includes pre-primary classes in public and private primary schools. It excludes independent private schools, which provide a large part of pre-primary education.

Public childcare spending per child

Public spending in percent of GDP is multiplied by GDP in 1995 PPP-US\$ to obtain the level of spending in 1995 PPP-US\$. The target population of children for formal day care and pre-primary school is calculated using data on age of entry to primary school from the UNESCO Statistical Yearbook (various years) and data on the number of children by age category. The latter is obtained from national sources for EU countries and from the United Nations World Population Prospects 1950-2050 (The 2000 revision, February 2001) for other countries. The target population of children can further be split between formal

day care and pre-primary school using data on age of entry to pre-primary school from the UNESCO Statistical Yearbook.

A1.3 Maternity, parental, and childcare leave

The main data source is the “Comparative maternity, parental, and childcare database” from Gauthier and Bortnik (2001). The total number of leave weeks is the maximum number of leave weeks that can be taken by a mother for the birth of a first child as maternity leave, parental leave, and childcare leave. In some countries, leave of a longer duration is available for the second and subsequent children. The provisions for the most generous scheme are used, even though they may not apply to all women depending on their employment history or income. Only the national legislation is used; variations in schemes by region, province, *länder*, or canton are not included. The total number of paid leave weeks is the sum of leave weeks, each multiplied by the corresponding replacement rate (expressed as a percent of the average manufacturing wage for women). The latter does not take into account means-tests nor private negotiated agreements to top up formal entitlements. Leave reserved for the father is not included.

The following country notes apply:

Australia: Commonwealth employees have had the right to a 12-week paid maternity leave since 1973, but this does not apply to the private sector (hence it is not included).

Belgium: For 1971-1993, the benefit listed does not include the paid maternity leave that employers are required by law to provide.

Canada: *i)* Legislation introduced in 2001 increases the duration of the parental leave from 10 weeks to 35 weeks; *ii)* The Canadian labour code includes provision of leave for pregnant or nursing women from the beginning of the pregnancy to the end of the twenty-fourth week following the birth. This is independent from the parental leave legislation and is therefore not included in the table.

Finland: For the period 1995-1999, supplements to the benefit which depend on the annual income of the mother are not included because the average female earnings in manufacturing do not fall within the range of income that receives the supplement.

France: For 1997-1999, the benefit is 100 per cent of earnings paid up to a social security ceiling. However, it was taken to be 100 per cent of earnings for the calculations.

Greece: The duration of maternity leave is stated in number of days. This was converted into number of weeks by assuming seven days of leave per week.

Ireland: Legislation introduced in 1981 created a dual system of benefits. A basic flat rate benefit continued to be offered (as before), but a new system provided 70 per cent of earnings for employed women only. The latter is the benefit used in the calculations.

Japan: The duration of maternity leave is stated in number of days. This was converted into number of weeks by assuming seven days of leave per week.

Luxembourg: One parent can opt to receive a flat rate childcare allowance paid up to 22 months (in 1999), but without guarantee of re-employment. This is not part of the parental leave scheme.

Netherlands: Legislation introduced in 1990 entitles each parent to an unpaid part-time leave of six months (parent must work at least 20 hours per week). This part-time leave was converted to a three-month leave on full-time basis for the calculations.

New Zealand: i) A flat rate maternity benefit for single mothers (income-tested) is not included in the calculations; ii) A paid maternity leave of 12 weeks was introduced in 2002.

Portugal: The duration of maternity leave is stated in number of days. This was converted into number of weeks by assuming seven days of leave per week

Spain: For 1991-1999, the benefit is expressed as 100 per cent of the benefit base. Although it may not mean 100 per cent of the wage, it was taken to be 100 per cent of the wage for the calculations.

Sweden: The duration of maternity leave is stated in number of days. This was converted into number of weeks by assuming seven days of leave per week

Switzerland: There is a federal minimum maternity benefit of two francs a day, but schemes vary depending on Canton and Sickness Fund. Due to lack of information it is not possible to give an accurate representation of the benefits provided in Switzerland. There is no federal scheme concerning parental/childcare leave.

United Kingdom: i) Legislation in 1991 created a dual system of benefits. The basic flat rate benefit continued to be offered as the “State Maternity Allowance”. A new system of benefits called “Statutory Maternity Pay” was offered to employed women. The latter is the benefit used for calculations from 1991 onward; ii) Labour law introduced in 1979 entitles women who have just given birth to be absent from work for up to 29 weeks (mothers only). This is independent from parental leave legislation and has therefore not been included in the table.

United States: Although there is no federal benefit scheme in place, five states have enacted their own maternity benefits schemes. In addition, several states have enacted legislation concerning unpaid maternity leave.

For some countries not included in the database, an estimate was constructed based on information from “Social Security Programs Throughout the World” published by the United States Social Security Administration (various years). These countries are Iceland, Korea, Mexico, Turkey, the Czech Republic, the Slovak Republic, Hungary, and Poland.

APPENDIX 2: CALCULATION OF PARTIAL CORRELATIONS AND CONTRIBUTIONS OF EXPLANATORY VARIABLES TO FEMALE PARTICIPATION

A2.1 Partial correlations between female labour participation and selected variables (Figure 12)

The calculation of partial correlations is based on the estimation of model I in Table 8. For each selected explanatory variable (X), the “unexplained female participation” is calculated as the difference between the dependent variable and the effect of all explanatory variables but that of X. The partial correlation is the correlation between this measure of “unexplained female participation” – once the effect of other explanatory variables has been accounted for – and the variable X.

A2.2 Contributions of explanatory variables to participation deviations from OECD mean (Figures 13 and 14)

These calculations are based on model I (Figure 13) and model II (Figure 14) in Table 8. For a given country *i* in a given year *t*, the specification of model I reads:

$$\ln(PR_{i,t}) = \sum_k \alpha^k \ln(X_{i,t}^k) + \beta Y_{i,t} + \gamma (\ln(Z_{i,t}))^2 + \mu_i + \varepsilon_{i,t} \quad (1),$$

where *PR* denotes the female participation rate, *X* denotes variables which enter in natural logarithm, *Y* denotes the variable Child benefits (not transformed), *Z* denotes Paid leave (entered as the square of the natural logarithm), μ denotes the country fixed effect and ε denotes the residual.

Taking the average over all countries for which data are available in this given year yields:

$$\overline{\ln(PR)}_t = \sum_k \alpha^k \overline{\ln(X^k)}_t + \beta \overline{Y}_t + \gamma \overline{(\ln(Z))^2}_t + \overline{\mu} + \overline{\varepsilon}_t \quad (2),$$

where the upper-bar denotes the arithmetic average over countries in the year *t*.

Taking the difference between (1) and (2) yields:

$$\ln(PR_{i,t}) - \overline{\ln(PR)}_t = \sum_k \alpha^k \left[\ln(X_{i,t}^k) - \overline{\ln(X^k)}_t \right] + \beta (Y_{i,t} - \overline{Y}_t) + \gamma \left[(\ln(Z_{i,t}))^2 - \overline{(\ln(Z))^2}_t \right] + \mu_i - \overline{\mu} + \varepsilon_{i,t} - \overline{\varepsilon}_t$$

The contribution of each explanatory variable to the log-deviation of the female participation rate of a given country from the OECD mean is given by the product of the coefficient and the log-deviation of the explanatory variable from the OECD mean value of the explanatory variable. Due to the logarithmic character of the econometric specification, the OECD means actually refer to geometric means. The contributions of all explanatory variables are additive in the sense that they add up to the log-deviation of the female participation rate from the OECD mean. These contributions can simply be expressed in percent deviation of the female participation rate from the OECD mean by taking exponentials, subtracting one, and multiplying by 100. These percent deviations are also additive, but in a compounded sense. A similar derivation can be done for each equation of model II (part-time and full-time participation).

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