

Why Are Mothers Working Longer Hours in Austria than in Germany? A Comparative Microsimulation Analysis*

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Abstract

Labour force participation rates of mothers in Austria and Germany are similar; however, full-time employment rates are much higher among Austrian mothers. In order to find out to what extent these differences can be attributed to differences in the tax–transfer system, we perform a comparative microsimulation exercise. After estimating structural labour supply models for both countries, we interchange two important institutional

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characteristics of the two countries – namely, (i) the definition of the tax unit within the personal income tax and (ii) the parental leave benefit scheme. As our analysis shows, differences in mothers' employment patterns can partly be explained by the different tax systems: while Germany has a system of joint taxation with income splitting for married couples, Austria taxes everyone individually, which leads to lower marginal tax rates for secondary earners than in the German system.

I. Introduction

Employment rates of mothers with young children vary considerably across European countries. Traditionally, Scandinavian countries have relatively high employment rates of mothers, while in Southern European countries, but also in Austria and Germany, employment rates of mothers are relatively low (OECD, 2002). These differences have often been explained by work incentives created by the tax–transfer system and the childcare infrastructure (Dingeldey, 2001; Jaumotte, 2003). However, these institutional factors influence not only the participation decision but also working hours. Countries with similar participation rates of mothers can have quite different average working hours of employed mothers. Comparing the employment behaviour of mothers with young children in Austria and Germany, we see that the share of mothers with children above age 2 who work is relatively similar in both countries. However, once Austrian mothers start working, they are twice as often working full-time compared with German mothers. We want to quantify the extent to which these differences can be explained by specific features of the tax–transfer systems in both countries.

Comparing Austria and Germany is an interesting case because the two countries have many similar institutions and can both be assigned to the corporatist welfare state regime (Esping-Andersen, 1990). Furthermore, the childcare institutions are very similar as far as availability, costs and quality are concerned. Also, fertility behaviour is similar in the two countries, which is indicated by almost equal total fertility rates and mean ages of mothers at first birth.¹ However, there are three important differences that might influence the work incentives for mothers with young children. First, income taxation differs with respect to the definition of the tax unit. While in Austria all individuals, whether married or not, are taxed individually, Germany has a system of joint taxation with income splitting for married spouses. This feature of the German tax system has a strong influence on marginal tax rates and thus creates very different work incentives for secondary earners. The second important difference in the tax–transfer systems is the design of

¹The total fertility rate amounted to 1.34 in Germany and 1.38 in Austria in 2003. The mean age of women at first birth was 28.23 in Germany and 28.77 in Austria, also in 2003. Source: Eurostat, 2006.

the parental leave benefit scheme. The Austrian scheme is much more generous than the German one, in terms of the amount of the benefit, the maximum duration period, income threshold and withdrawal rates. Third, we find differences in the generosity of social assistance, which is greater in Germany than in Austria. In both countries, however, social assistance mostly affects the work incentives of single mothers only.

To investigate to what extent differences in labour supply behaviour can be traced back to these features of the tax–transfer systems, we have to control for differences in preferences and other aspects of the tax–benefit system in these countries. We first show the structure of work incentives induced by the tax–transfer system for stylised family types. Then we pursue a comparative microsimulation exercise, starting with the estimation of a behavioural model of maternal labour supply based on representative datasets and detailed tax–transfer models for both countries. We interchange two distinctive features of the tax–transfer systems in Austria and Germany – namely, the definition of the tax unit and the nature of the parental leave benefit. For Germany, we simulate the introduction of individual taxation as practised in Austria. Separately, we simulate a switch to the Austrian parental leave scheme. Finally, we simulate both institutional characteristics at the same time to show the joint effect. The same exercise is done the other way round by implementing the German legislation in Austria.

Our results show that interchanging the definition of the tax unit and the parental leave benefit scheme of the tax–benefit system would in fact increase German mothers' participation rates and decrease participation in Austria. Also, hours of work would change in both countries. In fact, we find that these two distinctive institutional characteristics explain about 20 per cent of the difference in full-time employment rates. The difference in part-time rates, however, would become even more pronounced if both countries were to interchange the definition of the tax unit and the parental leave benefit: part-time employment would rise in Germany and fall in Austria. This can partly be explained by lower childcare costs for part-time slots in Germany as well as by strong incentives for marginal employment within the German tax system.

The remainder of the paper is organised as follows. In the next section, we describe the differences in institutions and mothers' employment behaviour between Austria and Germany in more detail. Based on this information, we illustrate the work incentives created by the tax–transfer system in both countries in a descriptive way. In Section III, we turn to the empirical analysis. Section IV provides a discussion of the empirical findings and Section V summarises and concludes the paper.

II. Differences and similarities between Austria and Germany

1. Mothers' employment behaviour

Table 1 shows that in both countries, mothers' employment rates vary strongly by the age of their youngest child as well as by marital status. Moreover, we still find considerable differences in the employment rates of mothers living in East and West Germany.² This fact can be explained by the different traditions of combining motherhood and work life in East and West Germany before Reunification (Rosenfeld, Trappe and Gornick, 2004). In the following, we will therefore restrict our analysis to a comparison of West Germany and Austria.

In both Austria and Germany, participation rates and working hours increase as the youngest child gets older. Apart from this common trend, we find that full-time employment is much more common in Austria than in West Germany. This is true for all subgroups of single and married or cohabiting mothers. The difference in full-time employment rates is

TABLE 1
Employment patterns of mothers with young children in Austria and Germany

	<i>Per cent</i>								
	Mothers with youngest child aged 0–2			Mothers with youngest child aged 3–10			All mothers		
	<i>Austria</i>	<i>West Germ.</i>	<i>East Germ.</i>	<i>Austria</i>	<i>West Germ.</i>	<i>East Germ.</i>	<i>Austria</i>	<i>West Germ.</i>	<i>East Germ.</i>
<i>Married/cohabiting</i>									
Not working	77.4	63.0	58.1	36.6	32.0	28.9	52.1	42.7	38.3
Part-time working	12.2	31.0	20.3	35.2	56.0	34.1	26.5	47.3	29.7
Full-time working	10.4	6.1	21.6	28.2	12.0	37.0	21.4	10.0	32.1
<i>Single</i>									
Not working	75.7	75.1	**	17.1	37.0	**	36.3	44.1	56.6
Part-time working	8.1	21.4	**	26.3	44.7	**	20.4	40.4	20.1
Full-time working	16.2	3.5	**	56.6	18.3	**	43.4	15.5	23.3

** indicates cells with not enough observations (fewer than 30).

Sources: Austrian version of SILC 2004; SOEP 2004.

²See also Geisler and Kreyenfeld (2005) for a detailed analysis of mothers' employment patterns in East and West Germany after Reunification.

relatively small for married or cohabiting mothers whose youngest child is less than 3 years old. For married or cohabiting mothers with children between 3 and 10 years, however, we find large differences in full-time employment rates between Austria (28 per cent) and West Germany (12 per cent). This difference is even more pronounced for single mothers with children in the same age group: nearly 57 per cent of single mothers with children between 3 and 10 are working full-time in Austria, compared with only about 18 per cent of such mothers in West Germany.

2. Institutions³

Income taxation

As far as income taxation is concerned, the most important difference between Austria and Germany is the fact that married spouses can file jointly and apply full income splitting in Germany,⁴ while in Austria all persons are taxed individually. Under the German system of joint taxation with income splitting (*Ehegattensplitting*), the income tax of a married couple is calculated by applying the tax function to half of the sum of the spouses' incomes. This amount is then doubled to determine the tax amount of the couple. This procedure guarantees that married couples – given a certain level of household income – will always be charged the same amount of income tax, no matter how the income is distributed between husband and wife. Thus the German system implies a 'splitting advantage', defined as the difference between the tax amount that a married couple pays under income splitting and the amount the same couple would pay in the case of separate filing – or in the case of individual taxation as practised in Austria. The amount of the 'splitting advantage' depends on the income distribution between husband and wife and on the absolute level of household income.⁵

Family allowance

The most important cash transfers for families with dependent children are very similar in Germany and Austria as far as the amount of the benefit and the entitlement regulation are concerned. In Austria, the family allowance (*Familienbeihilfe*) is a universal benefit amounting to between €1,260 and €2,100 annually per child, depending on the age and birth order of the child. This benefit is supplemented by a refundable tax credit (*Kinderabsetzbetrag*) that amounts to €610.8 annually per child. The German family allowance (*Kindergeld*) amounts to €1,848 per year independent of the age of the child. From the fourth child onwards, this child benefit rises to €2,148 per year. In

³Since we use data from 2003 for the empirical analysis, we describe the institutional characteristics of both countries for the same year.

⁴Note that joint filing is optional, not mandatory, in Germany.

⁵See Steiner and Wrohlich (2004) for more details on the 'splitting advantage' in Germany.

contrast to Austria, which grants a fully refundable child tax credit in addition to the family allowance, Germany applies a higher-yield test (*Günstigerprüfung*) between the family allowance and a tax allowance of €2,904 per year, so that whichever allowance is the greater is awarded. Although at first sight this seems to be an important difference compared with the Austrian system, in fact the tax allowance only leads to higher income gains than the family allowance for taxable incomes above €63,000 per year, which corresponds more or less to the 85th percentile of the distribution of taxable incomes (Steiner and Wrohlich, 2006).

Parental leave benefit

Parental leave benefit schemes differ quite substantially between Germany and Austria concerning the amount, the duration period, the income thresholds up to which the benefit is granted and the withdrawal rates. In Austria, parents can draw the parental leave benefit until the youngest child reaches the age of 30 months. If the benefit is drawn by both parents, the duration period is extended until the child is 3 years old. The benefit amounts to €5,303 per year for the youngest child. In the case of multiple births, a supplement of 50 per cent for every additional child is granted until the birth of a further child. The parental leave benefit is only granted if the gross annual income of the parent who is receiving the benefit does not exceed €14,600 per year. Parents with very low income may apply for a supplementary payment, which is granted as a loan.

In Germany, the maximum duration period of the parental leave benefit is 24 months after the birth of the youngest child. The annual benefit is only about 70 per cent of the Austrian benefit and amounts to €3,684. In contrast to Austria, where the benefit is only tested against the income of the parent who receives the transfer, the parental leave benefit in Germany is means-tested at the household level using two different income thresholds. In the first six months after the child's birth, the income threshold up to which the benefit is paid is more generous (net household income must not exceed €51,130 per year) than that for the next 18 months (no more than €16,470 per year). If income exceeds the threshold in the first six months, no benefit is granted at all. In the following 18 months, the parental leave benefit is withdrawn at a rate of 62.4 per cent. The parental leave benefit is only granted if one of the parents is working less than 30 hours a week.⁶

Regulations concerning job protection during parental leave and legal rights to part-time work are very similar in Germany and Austria. In

⁶Note that Germany introduced a new parental leave benefit (*Elterngeld*) in 2007. This new benefit replaces the *Erziehungsgeld* and amounts to 67 per cent of net earnings prior to the birth for the stay-at-home parent for a maximum duration of one year. If both parents share parental leave, the maximum duration can be extended by two more months. Spiess and Wrohlich (2008) provide a detailed description of the new German parental leave benefit.

Germany, each parent has a legal right to take leave of 36 months per child, whereas in Austria this period amounts only to 24 months. During the time of the parental leave, parents cannot be dismissed. In both countries, parents can choose part-time leave instead of full leave. They have a legal right to part-time work as soon as their company has 15 (Germany) or 20 (Austria) employees. The legal claim to part-time work is longer in Austria (seven years) than in Germany (three years).

Social assistance

Unemployed individuals who are not covered by unemployment benefits are eligible to social assistance in Germany. Among families with children, single mothers are the largest group of social assistance recipients in Germany (Becker, 2007). In 2003, out-of-work benefits for a single mother consisted of a basic social assistance of approximately €300 per month. This is increased by 55 per cent for any child under 7 years old and by 65 per cent for children older than 7. Moreover, there is a single parents' top-up amounting to 40 per cent of the basic social assistance. Also, housing costs are taken over by the social assistance authority. The withdrawal rate of these benefits is 85 per cent, but 25 per cent of the total amount of social assistance is not withdrawn. Family allowance and maintenance payments for children are counted as income of the child and are fully withdrawn.

In Austria, the nine regions are responsible for granting social assistance. The respective regulations differ considerably. There is a base amount that depends on whether a person is single and on whether they have dependent relatives. In addition, there are payments for accommodation, heating and clothes. For single parents, the base amount in 2003 ranged from €390 to €506 per month plus an amount for each child (paid 14 times a year) ranging from €106 to €146. Income and assets are withdrawn at a rate of 100 per cent, whereupon certain allowances are granted. These allowances differ by region and family characteristics.

Childcare institutions

Austria and Germany have very similar childcare markets that are characterised by subsidised childcare facilities of homogeneous quality at relatively low parental fees; however, there is only limited availability.⁷ In both countries, we observe limited availability of childcare for children under 3 years old. Moreover, in both countries, primary school, starting at the age of 6, is organised in the morning only (Gottschall and Hagemann, 2002).

In the previous literature on mothers' labour supply (see, for example, Merkle (1994) for Germany and Mahringer (2005) for Austria), childcare

⁷See Dörfler (2007) for a detailed comparison of childcare institutions in Austria and Germany.

costs have often been measured as average parental fees for centre-based childcare. However, given the low availability of formal childcare slots in both countries, in particular for children under 3, it cannot be assumed that childcare costs equal the average parental fees charged by formal childcare centres.⁸ An adequate measure of childcare costs in both countries has to take into account the possibility that childcare is rationed.⁹ We will do this by assuming that childcare costs can be modelled as a weighted average of the fees for a subsidised slot and the private costs of childcare, yielding a measure of ‘expected costs of childcare’. We present a detailed description of the calculation of these costs in Appendix B. Table 2 shows the availability of childcare slots and the average fees of childcare facilities in Austria and Germany.¹⁰ As far as the price for private childcare is

TABLE 2
Costs and availability of formal childcare in Austria and Germany

	Children aged 0–2		Children aged 3–6 ^a		Children aged 7–10	
	Austria	Germany	Austria	Germany	Austria	Germany
Number of part-time childcare slots per 100 children	3.4	0.8	19.3	57.1	26.9	8.9
Number of full-time childcare slots per 100 children	12.9	7.7	44.0	32.7	–	–
Average parental fee for a part-time slot (€/month)	118	62	118	60	131	49
Average parental fee for a full-time slot (€/month)	199	127	199	96	–	–

^aThe number of slots per 100 children aged 3–6 for Austria is somewhat underestimated due to the age classification we use. This age group contains four cohorts: 3-year-olds, 4-year-olds, 5-year-olds and 6-year-olds. However, usually children attend ‘*Kindergarten*’ for three years only.

Sources: Statistik Austria, 2003/04; Stadt Wien, MA 11A; Statistisches Bundesamt, 2004; SOEP 2002. Note that data on availability of childcare slots in Germany are available only every fourth year. Information on parental fees in the SOEP is only available in 2002.

⁸See Dörfler (2004) and Wrohlich (2008) for empirical evidence on excess demand for childcare in Austria and Germany respectively.

⁹Wrohlich (2007) has calculated the probability of being rationed with respect to centre-based care in Germany as 34 per cent for children aged 0–2 years, 6 per cent for children aged 3–6 years and 26 per cent for children aged 7–10 years.

¹⁰Note that the Austrian figures refer to values from the city of Vienna only, whereas the numbers for Germany refer to the national average. As a consequence, the parental fees for Austria shown in Table 2 are considerably higher than those for Germany. See Appendix B for a more detailed discussion.

TABLE 3
'Expected costs of childcare'

	Children aged 0–2		Children aged 3–6		Children aged 7–10	
	Austria	Germany	Austria	Germany	Austria	Germany
<i>Average expected childcare costs for part-time care</i>						
Per month	€311	€315	€163	€69	€253	€280
Per cent ^a	13.3%	10.3%	7.0%	2.3%	10.8%	9.2%
<i>Average expected childcare costs for full-time care</i>						
Per month	€635	€636	€387	€286	–	–
Per cent ^a	27.2%	20.8%	16.6%	9.4%	–	–

^aPercentage of median male income of persons aged 20 to 50 with a child younger than 14 in the household.

Sources: Authors' calculations based on: Statistik Austria, 2003/04; Stadt Wien, MA 11A; Statistisches Bundesamt, 2004; SOEP 2002 and 2004.

concerned, we assume an average of €5 per hour in Austria and Germany.¹¹ Table 3 summarises the expected costs for part-time and full-time childcare in both countries for different age groups. For children under 3 and for children aged 7 to 10, childcare costs are very similar in both countries. For children aged 3 to 6, costs are lower in Germany, which is due to the fact that the availability of subsidised childcare is relatively high for children in this age group since a legal right to a part-time slot was introduced in 1996.

We assume that whether and how much childcare is required for a child depends on the mother's and father's working decisions and the age of the child. Thus, if at least one of the parents is not working, no external childcare is necessary. If one parent is working part-time and the other full-time, children aged 0 to 6 years need part-time childcare whereas older children are assumed to be looked after in school. If both parents work full-time, children aged 0 to 6 need full-time care and children aged 7 to 10 need part-time care, since full-time care provided by schools is not common in Austria and Germany.

¹¹While in Germany prices of day-care mothers are used as a yardstick (www.tagesmutter.de), in Austria this would not be appropriate. Austrian day-care mothers get around €2 per hour (www.efk.at/main/m_tagesmutter_3.htm), which is only slightly above the hourly cost of public childcare slots, but day-care-mother slots are not always readily available either. However, even if private childcare by day-care mothers is limited in Austria, there is no restriction on getting childcare by 'Leihomas' (surrogate grandparents) or childminders. *Leihomas* cost €6 per hour (Omadienst, katholischer Familienverband der Erzdiözese Wien), whereas childminder prices vary between €3 and €7 per hour (www.kinderbetreuung.at).

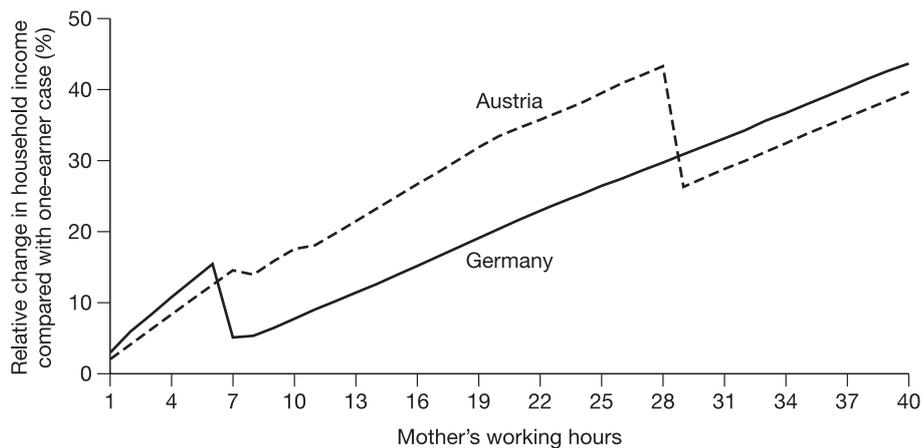
3. Work incentives in Austria and Germany

The differences and similarities in the tax–transfer systems, including the childcare systems, in Austria and Germany can best be summarised by comparing stylised budget constraints. The graphs in this section show the relative change in net household income at different levels of the mother’s working hours compared with the income when the secondary earner (i.e. the mother) does not work at all. We show these stylised budget constraints for three household types: a married couple with one child aged 1 year, a married couple with two children aged 4 and 7 years, and a single mother with two children of the same ages. For the two married couples, we assume that the husband is working full-time at the median hourly wage of the male wage distribution (€15 in Germany, €13 in Austria) and that the mother earns the median hourly wage of the female wage distribution (€12 in Germany, €10 in Austria), which we also assume for the example of the single mother.

Figures 1 to 3 show the change in net household income ignoring the costs of childcare. The two tax–transfer systems generate several important differences. The income gain for all three family types is higher in Germany than in Austria for low levels of mother’s working hours: in the case of the couple with a 1-year-old child (Figure 1), net household income at a weekly working time of six hours exceeds income at zero working hours by 15.6 per cent in Germany but only by 12.6 per cent in Austria. Working above this threshold, however, becomes very unattractive in Germany, particularly for

FIGURE 1

Relative change in household income compared with mother’s non-participation: couple with one child (aged 1 year), without taking into account childcare costs



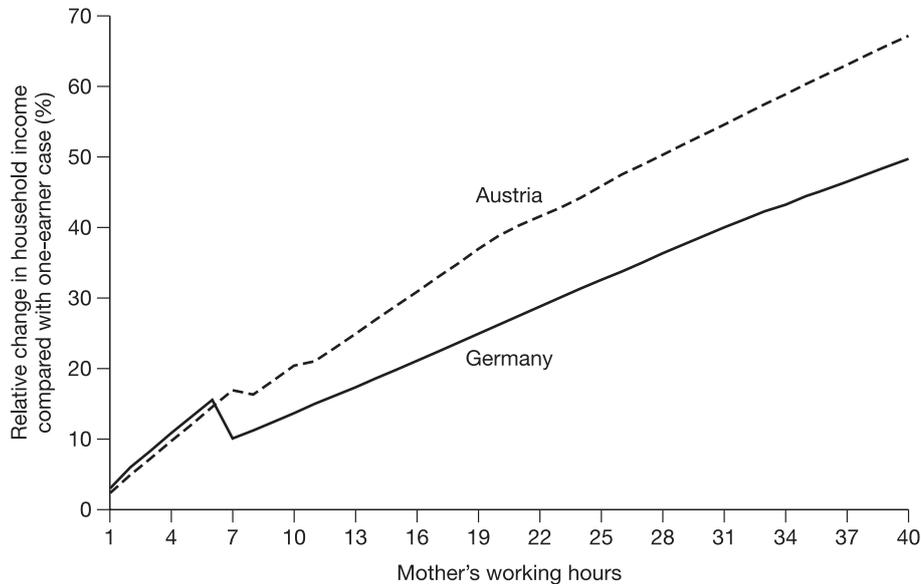
Sources: ITABENA based on Austrian version of SILC 2004; STSM based on SOEP 2004.

the family with the 1-year-old. At seven working hours, the mother's earnings exceed the minimum income limit for marginal employment (*Geringfügigkeitsgrenze*) and are thus subject to social security contributions and income taxation. Moreover, the family loses eligibility for the parental leave benefit because household income exceeds the maximum income threshold. It is only from 17 hours onwards that the relative gain in net household income is higher than at six working hours for the couple with the 1-year-old. In Austria, the kink above seven hours is negligibly small due to the fact that the minimum income limit for marginal employment in Austria only affects social security contributions, not income tax. Since each spouse is taxed individually in Austria, the increase in income by working hours of the mother is much steeper than in the German case. However, there is a large drop in the income gain at 29 hours due to the withdrawal of the parental leave benefit. Thus, full-time work for mothers with children aged 1 is relatively unattractive compared with part-time work.

The budget line of a family with two children aged 4 and 7 years (Figure 2) shows fewer kinks in both countries, since this household is not eligible for parental leave benefit any more. Comparing the budget lines for this family under the two country-specific regimes reveals the 'pure' difference

FIGURE 2

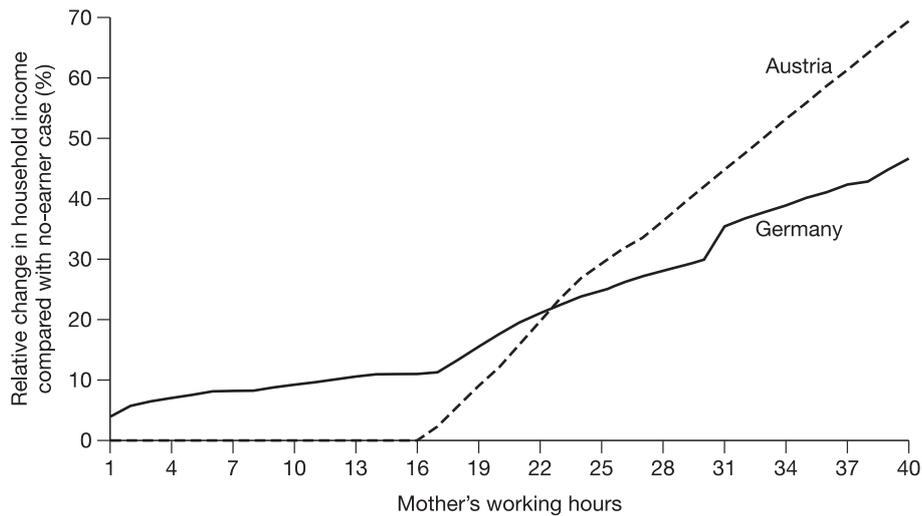
Relative change in household income compared with mother's non-participation: couple with two children (4 and 7 years old), without taking into account childcare costs



Sources: ITABENA based on Austrian version of SILC 2004; STSM based on SOEP 2004.

FIGURE 3

Relative change in household income compared with non-participation: single mother with two children (4 and 7 years old), without taking into account childcare costs



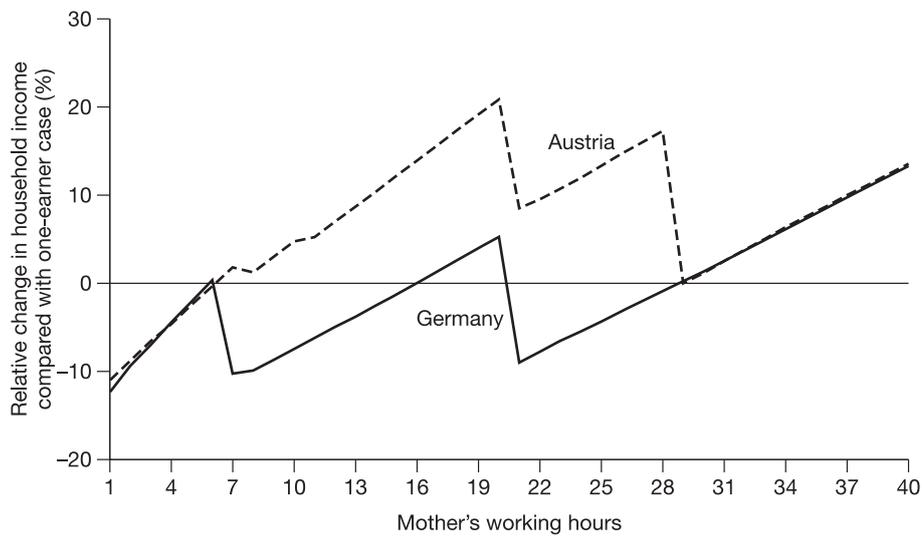
Sources: ITABENA based on Austrian version of SILC 2004; STSM based on SOEP 2004.

due to the tax system. Since low earnings are exempt from social security contributions and income taxation in Germany, the relative income gain at six hours of weekly work is slightly higher in Germany (15.5 per cent) than in Austria (14.6 per cent). From that threshold onwards, however, employment pays off much more in Austria than in Germany. The secondary earner is taxed individually in Austria, while in Germany the secondary earner has to pay the same marginal tax rate as the primary earner. Thus, part-time employment (20 hours) increases income by 39 per cent in Austria but by only 26.3 per cent in Germany compared with the single-earner case. If the mother is working full-time, net household income increases by 67.5 per cent in Austria but by only 50 per cent in Germany.

Figure 3 shows the example of a single mother with two children of the same ages as in the previous example (4 and 7 years old). In this case, there is no 'first earner' in the household; thus, if the mother is not working, the family is living solely on social transfers and maintenance payments for the children. Although the graph does not reveal the differences in absolute levels of social assistance, it can be seen that the German scheme is more generous as far as benefit withdrawal rates are concerned than the Austrian system. As a result, part-time employment is more attractive for single mothers in Germany than in Austria, while the opposite is true for full-time employment.

FIGURE 4

Relative change in household income compared with mother's non-participation: couple with one child (aged 1 year), taking into account childcare costs



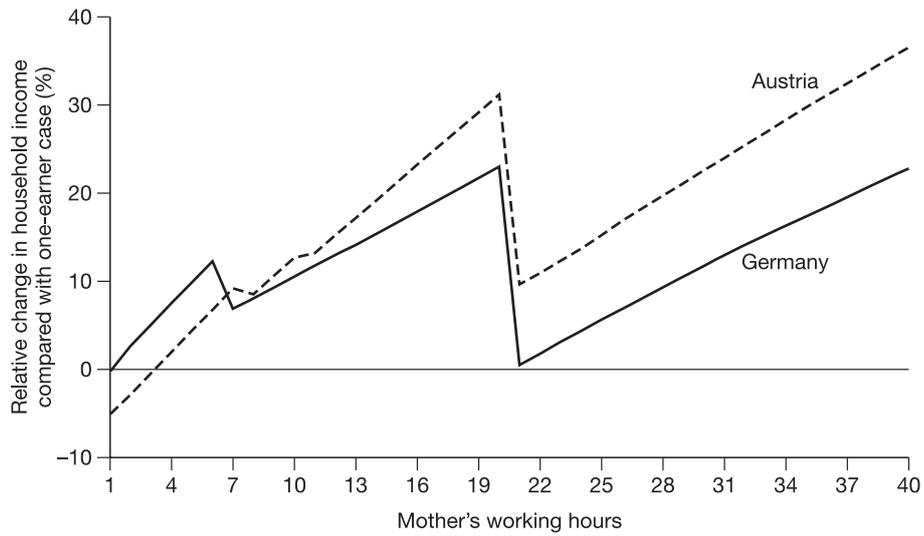
Sources: ITABENA based on Austrian version of SILC 2004; STSM based on SOEP 2004.

Figures 4 to 6 show the relative changes in household income for the same example households. However, in contrast to the previous graphs, childcare costs are deducted according to the age and number of children. We assume that if the mother is working 1–20 hours per week, part-time care has to be purchased for all children up to 6 years old. If the mother is working more than 20 hours, full-time care has to be purchased for children in this age group as well as part-time care for children aged 7 to 10. If the mother is not working, we assume that the household does not have to pay for childcare.

Deducting childcare costs in the way described above results in losses of household income as mothers start to work, because childcare costs are high, particularly for families with children under 3. German mothers with a child in this age group can increase household income only by 0.4 per cent if they work six hours per week, as shown in Figure 4. In Austria, household income is even 0.3 per cent lower than in the single-earner (and no childcare) case. Above the threshold of six hours of weekly work, we find the same pattern that has already been illustrated in Figures 1 and 2: the increase in household income is much steeper in Austria than in Germany. Part-time employment at 20 hours of weekly work increases household income by 21 per cent in Austria but only by 5 per cent in Germany. Full-

FIGURE 5

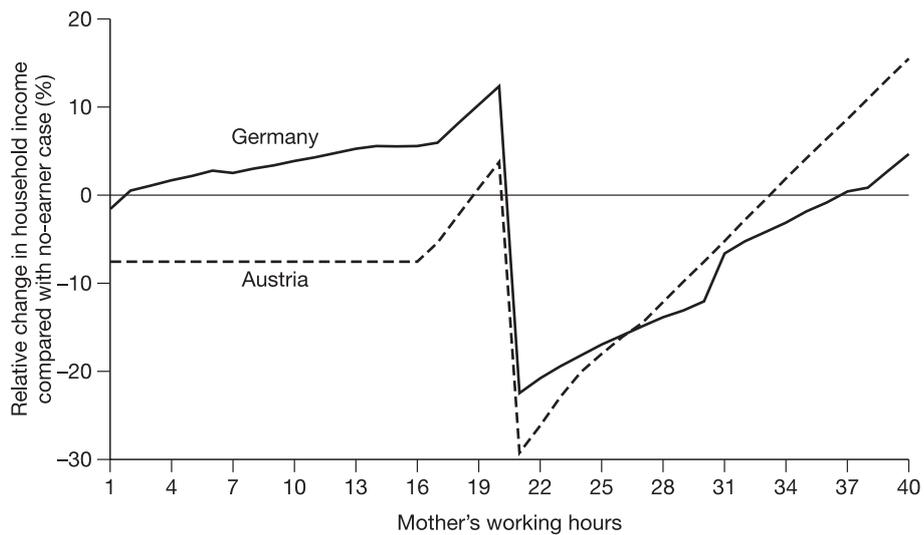
Relative change in household income compared with mother's non-participation: couple with two children (4 and 7 years old), taking into account childcare costs



Sources: ITABENA based on Austrian version of SILC 2004; STSM based on SOEP 2004.

FIGURE 6

Relative change in household income compared with non-participation: single mother with two children (4 and 7 years old), taking into account childcare costs



Sources: ITABENA based on Austrian version of SILC 2004; STSM based on SOEP 2004.

time work is relatively unattractive in both countries, increasing net income by only 14 per cent.

The example of a married couple with two children aged 4 and 7 years (Figure 5) illustrates very clearly the different incentive structures in each country. Weekly work of six hours leads to higher income gains in Germany (12.3 per cent) than in Austria (6.7 per cent). Full-time work, on the other hand, adds only little more to household income in Germany – 22.7 per cent compared with a single-earner family – whereas in Austria income rises by 36.7 per cent. Most remarkably, the net income gain from part-time work in Germany is almost exactly the same as the gain from full-time work, which will make working full-time very unattractive.

Single mothers (Figure 6), however, are not affected by joint taxation in Germany, and thus part-time employment is more attractive in Germany than in Austria. High childcare costs in both countries, however, are adding to the withdrawal of social benefits, which makes employment relatively unattractive in both countries. Austrian single mothers earning the median wage can increase net household income by 15 per cent if they work full-time compared with net income in the case of non-participation. In Germany, this increase amounts to only 5 per cent.

We can sum up the findings of the preceding graphical illustrations as follows. For married mothers with children under 2 years old, marginal employment (at six hours of work) is slightly more attractive in Germany than in Austria. Part-time work at about 20 hours is more attractive in Austria than in Germany; however, full-time employment is not attractive for Austrian mothers and hardly attractive for German mothers when compared with part-time work. For married mothers with children aged 3 to 10, we also find that marginal employment is more attractive in Germany than in Austria, whereas full-time employment is far more attractive in Austria than in Germany. This is also true for single mothers, even though they are not affected by joint taxation in Germany.¹² Full-time work incentives are stronger for this group in Austria due to less generous out-of-work benefits.

Obviously, the differences in employment patterns of mothers with young children in Austria and Germany reflect the institutional characteristics of the two tax-transfer systems. The participation rate of mothers with very young children is higher in Germany than in Austria, which is to a large extent driven by the high rate of part-time and marginal employment. Mothers with children over 2 years old have very similar participation rates in both countries; however, the full-time rate for mothers in Austria is almost twice as high as the rate in Germany. Yet employment patterns are not only

¹²Table A1 in Appendix A illustrates that sample sizes get very small for subgroups such as single mothers. Therefore we are not able to perform a separate analysis for this group.

affected by institutional settings but also by the empirical distribution of wages and by preferences. In the following empirical analysis, we apply structural models for Austria and Germany to take these labour market characteristics into account.

III. Empirical methodology and data

We estimate two labour supply models, each embedded in a detailed tax–benefit model of the Austrian and German legislation, respectively, in order to find out to what extent the differences in employment patterns of mothers with young children can be attributed to the different tax and benefit systems. First, structural parameters of a labour supply model are estimated separately for Germany and Austria on representative micro-data-sets for each country. We model labour supply in a discrete choice framework using the choice categories non-participation,¹³ part-time work and full-time work. For each category, net incomes are calculated using detailed tax–benefit models. In a further step, we perform different simulations of the tax–benefit system in both countries: for Germany, we simulate first the introduction of individual taxation as practised in Austria, second the Austrian type of the parental leave benefit and third both changes simultaneously. Similarly, we perform three simulations for Austria. Using the structural parameters from the labour supply estimation, we then predict the labour market outcomes under the simulation scenarios. With this procedure, we can estimate the overall effect of the two most important institutional differences between Austria and Germany, but also – in an intermediate step – distinguish between the effect of the tax system and the effect of the parental leave benefit scheme.

1. Data

The empirical analysis for Germany is based on the 2004 wave of the Socio-Economic Panel (SOEP), and for Austria we use the 2004 wave of the European Union Statistics on Income and Living Conditions (SILC). Both data-sets are representative samples of households living in the respective country, with detailed information on household income, working hours and household structure such as number and exact ages of children.¹⁴

For both countries, we restrict the sample to families (married and cohabiting couples as well as single mothers) with at least one child aged 10

¹³Non-participation also includes mothers who are on maternity leave, who are coded as employed in many data-sets but not in ours.

¹⁴For more information on the SOEP, see www.diw.de/soep. For the SILC for Austria, see www.statistik.at/web_de/fragebogen/private_haushalte/eu_silc/index.html.

TABLE 4

Average annual household net income before and after deduction of childcare costs

	Austria		Germany	
	<i>Before deduction of childcare costs</i>	<i>After deduction of childcare costs</i>	<i>Before deduction of childcare costs</i>	<i>After deduction of childcare costs</i>
Mother not working	26,950	26,950	33,293	33,293
Mother working part-time	34,031	32,680	42,224	41,184
Mother working full-time	37,759	33,563	41,319	37,184
All mothers	31,398	30,030	38,353	37,318

Sources: ITABENA based on Austrian version of SILC 2004; STSM based on SOEP 2004.

years or younger. Mothers who are self-employed or in education are also excluded from our sample. For Germany, we restrict the sample to families living in West Germany. Table A1 in Appendix A shows descriptive statistics on the number of observations in both data-sets and some socio-economic characteristics. Net household income, which is a crucial variable in the estimation of labour supply, is calculated using tax-benefit simulation models that contain all the important features of the German and Austrian tax-transfer systems.¹⁵ On the basis of these tax-benefit models, it is possible to calculate net household incomes for different working hours categories which will be used for the estimation of labour supply.

Table 4 shows average net household incomes for different hours categories for both data-sets, before and after the deduction of childcare costs.

2. Labour supply estimation

The labour supply estimation is based on a structural model of the mother's utility.¹⁶ It is assumed that the mother maximises a utility function in the arguments leisure and disposable household income. Working hours are modelled as a categorical variable. This is done for several reasons. First, it takes into account the fact that hours of work are heavily concentrated at particular hours. Second, the specification of a relatively small number of working hours categories leads to a tremendous reduction in computational burden of calculating net household income at each possible hours choice. Given the complexities of the tax-transfer systems in both countries, this simplification is in fact a prerequisite for an adequate specification of the

¹⁵We use the tax-benefit models STSM (Steiner, Haan and Wrohlich, 2005) for Germany and ITABENA (Dearing and Lietz, 2007) for Austria.

¹⁶This model is a special case of van Soest's (1995) model with joint estimation of couples' working hours. In our model, the husband's hours are fixed. This can be justified by empirical findings of relatively inelastic labour supply of men, as shown by Blundell and MaCurdy (1999) or Steiner and Wrohlich (2004) for Germany.

budget constraint. We assume a choice set that consists of three working hours categories – non-participation, part-time work and full-time work (see Table 1 for the distribution of households across these choice categories). Note that the part-time category includes marginal employment.¹⁷

The econometric model is based on the assumption that a mother compares the expected utility obtained from net income and her leisure associated with the choice of a particular hours category.¹⁸ It is assumed that the mother's utility index for a particular hours category k can be modelled by the following quadratic function:

$$(1) \quad U_k(x_k) = x_k'Ax_k + \beta'x_k + \varepsilon_k \quad \text{where} \quad x = (y, l)'$$

The components of x are net household income, y , and the mother's leisure, l . These components enter the utility function in linear, quadratic and cross terms. Matrix A contains the coefficients of the quadratic and the cross terms, while the vector β contains the coefficients of the linear terms. ε_k is a stochastic error term accounting for unobserved factors that affect the mother's utility. The mother will choose hours category k if, in probability terms, the associated utility index U_k exceeds the utility index in any other possible alternative l , i.e.

$$(2) \quad P(U_k > U_l) = P[(x_k'Ax_k + \beta'x_k) - (x_l'Ax_l + \beta'x_l) > \varepsilon_l - \varepsilon_k]$$

Assuming that ε_k is distributed identically across all hours categories according to an extreme-value distribution, the difference in the utility index between any two hours categories follows a logistic distribution.¹⁹ Under this distributional assumption, the probability of choosing alternative k relative to alternative l can be described by a conditional logit model as introduced by McFadden (1973):

$$(3) \quad P(U_k > U_l) = \frac{\exp(x_k'Ax_k + \beta'x_k)}{\sum_m \exp(x_m'Ax_m + \beta'x_m)} \quad \forall l \neq k$$

¹⁷Average working hours in the part-time category amount to 20.5 in Austria and 17.2 in Germany; in the full-time category, the average working hours amount to 34.6 in Austria and 35.6 in Germany. Fathers' working hours, which are assumed to be exogenous in our analysis, amount on average to 39.2 in Germany and 33.6 in Austria.

¹⁸We assume that 80 hours per week is the maximum time budget that can be allocated to market work and leisure. Note that leisure includes all sorts of non-market activities.

¹⁹The assumption that the error term follows an extreme-value distribution is rather restrictive and results in the property of the independence of irrelevant alternatives (IIA). Haan (2006) has shown for the case of women's labour supply estimated on the SOEP database that labour supply elasticities resulting from a conditional logit model as outlined above are not significantly different from elasticities derived from the estimation of a random coefficient model that is not based on the IIA assumption.

where the summation sign is defined over all possible alternatives, i.e. hours categories. We control for observed heterogeneity by accounting for mother's characteristics such as age, nationality, educational characteristics and number of children by different age groups.

Results of the labour supply estimation for Austria and Germany are reported in Table A2 in Appendix A. The coefficients, which can be interpreted as parameters of the utility function, lead to plausible results as far as the theoretical predictions are concerned. First derivatives of the utility function with respect to income and leisure are positive for almost all households in both countries. The second derivative of the utility function with respect to income is equal to zero in Germany and is small and negative in Austria. The second derivative with respect to leisure is negative in Germany and close to zero in Austria.

On the basis of these estimated parameters, we calculate the changes in participation rates that result from a 1 per cent increase in the gross hourly wage; these are presented in Table 5. Point estimates of the changes in

TABLE 5
Changes in participation rates caused by a 1 per cent increase in gross hourly wage

	<i>Austria</i>	<i>Germany (West)</i>
	<i>Change in participation rate (percentage points)</i>	
All mothers	0.155 (0.140, 0.171)	0.187 (0.139, 0.235)
Mothers with youngest child aged 0–2	0.106 (0.067, 0.145)	0.188 (0.137, 0.240)
Mothers with youngest child aged 3–10	0.185 (0.181, 0.189)	0.186 (0.138, 0.235)
	<i>Change in part-time participation rate (percentage points)</i>	
All mothers	0.058 (0.052, 0.063)	0.096 (0.068, 0.125)
Mothers with youngest child aged 0–2	0.100 (0.086, 0.113)	0.140 (0.103, 0.178)
Mothers with youngest child aged 3–10	0.032 (0.027, 0.038)	0.078 (0.049, 0.108)
	<i>Change in full-time participation rate (percentage points)</i>	
All mothers	0.098 (0.081, 0.115)	0.091 (0.059, 0.127)
Mothers with youngest child aged 0–2	0.006 (–0.041, 0.053)	0.048 (0.023, 0.073)
Mothers with youngest child aged 3–10	0.153 (0.148, 0.157)	0.108 (0.071, 0.145)

Note: Numbers in parentheses refer to 95 per cent confidence intervals derived using the bootstrap method (100 repetitions).

Sources: ITABENA based on Austrian version of SILC 2004; STSM based on SOEP 2004.

participation rates are higher in Germany than in Austria, although the difference is not statistically significant. Noticeably, the change in the participation rate is lower in Austria for mothers with small children than for mothers in general, while the elasticities are the same for both groups in Germany. A comparison of changes in part-time and full-time participation rates, however, reveals that the low elasticity for Austrian mothers stems from the very low change in full-time participation, which is not significantly different from zero. This can be explained by the incentive structure implied by the Austrian parental leave legislation. As we have shown in Figure 4, full-time employment leads to lower income in absolute terms than part-time employment due to the withdrawal of the parental leave benefit.²⁰

3. Policy simulations

As we have pointed out in Section II, the most important institutional differences between Austria and Germany that affect the work incentives of mothers with young children are (i) the definition of the tax unit in the case of married couples and (ii) the parental leave benefit scheme. In order to find out whether and how much these structural differences can contribute to explain the different employment patterns of mothers, we perform several simulation exercises. For both countries, we simulate three scenarios: one in which the tax system (joint versus individual taxation) is replaced by the tax system of the other country (A1 and G1), leaving all other institutions the same; one in which we replace the parental leave benefit regulations with those of the other country (A2 and G2); and finally one in which we replace both the definition of the tax unit and the parental leave benefit scheme with those of the other country (A3 and G3). Note that in simulations A1 and G1 (and A3 and G3), where we simulate joint taxation with income splitting for married spouses in Austria and individual taxation in Germany, we leave the tax schedule and the definition of taxable income as they are in both countries. However, in reforms G1 and G3 we take into account the single-earner tax credit, which is abolished in reforms A1 and A3.²¹

Table A3 in Appendix A shows the labour supply effects that result from the change in disposable incomes due to the policy simulations. As expected,

²⁰In order to check whether the elasticities derived from our models are sensitive to the assumption concerning the amount of childcare that needs to be purchased as a function of mothers' working hours, we estimated a model under the assumption that all children aged 3 to 6 years are in kindergarten. In other words, we assumed in this estimation that even non-working mothers with children in this age group have to purchase part-time childcare. The elasticities derived from this model are not significantly different from those presented in Table 5.

²¹In simulations A2 and G2 (and A3 and G3), benefits and income thresholds are taken from the respective country and are not adapted to different income levels.

Austrian mothers would reduce their labour force participation rate if joint taxation were introduced (simulation A1). Their participation rate would decrease by 2.4 percentage points, where about 1 percentage point is due to changes in part-time participation and 1.4 percentage points to changes in full-time participation.²² On the other hand, if Germany were to introduce Austria's system of individual taxation, mothers would increase labour force participation by nearly 7 percentage points. The majority of women starting to participate would choose part-time: the part-time employment rate would increase by 5.2 percentage points, whereas the full-time employment rate would increase by only 1.6 percentage points. These results are in line with the findings of previous studies that simulate a switch from joint to individual taxation in Germany, such as Strom and Wagenhals (1991), Gustafsson (1992) or Steiner and Wrohlich (2004).

The swap of parental leave benefits (A2 and G2) by definition only affects the group of mothers where the youngest child is less than 3 years old. If Germany and Austria were to keep their tax systems but introduce the other country's parental leave benefit scheme, we find that mothers' labour force participation would decrease in both scenarios. For Germany, this is what we would expect. A large share of German mothers within the original German institutions with children up to 2 years old (46 per cent) are not receiving the parental leave benefit, because the husband's earnings already exceed the income threshold, which is defined at the household level. For these mothers, the switch to the Austrian parental leave scheme makes non-participation far more attractive, because the Austrian benefit is means-tested at the individual level. Both part-time and full-time employments become less attractive under this simulation.

In the Austrian case, part-time employment would become less attractive whereas full-time employment would become much more attractive if Austria were to shift to the German parental leave scheme. This is explained by the German income threshold, which is defined at the household level and is thus much stricter than the Austrian limit. Taking up part-time work is therefore more often combined with a loss of the parental leave benefit; as a result, taking up part-time work becomes less attractive for Austrian mothers in the A2 scenario. However, the income loss when changing from part-time to full-time work would become less pronounced in the case of Austria introducing the German parental leave benefit. Thus full-time work would become more attractive for Austrian mothers if they were exposed to the German parental leave benefit regulations. Accordingly, we find a decrease

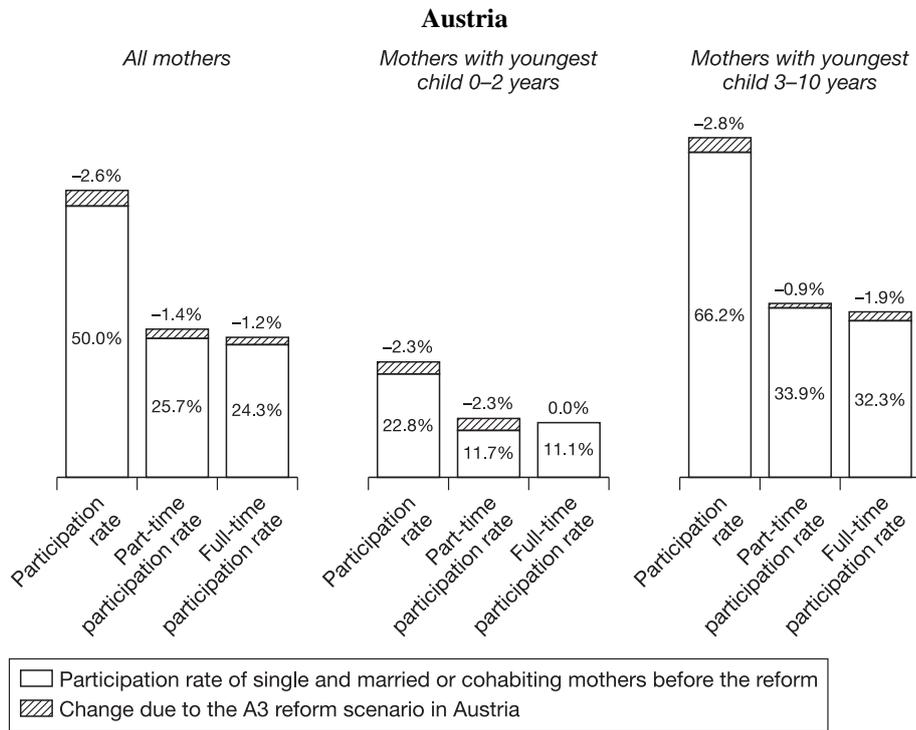
²²Note that with the data at hand, it is not possible to model the change in the 'marginal employment' category. From what we have shown in Section II.3, we would expect this category to become more attractive for Austrian mothers if German institutions were introduced.

in part-time participation rates of 1.2 percentage points and an increase in the full-time employment rate amounting to 0.6 percentage points. The effect on full-time employment is relatively small, however, and does not compensate for the drop in part-time employment. Thus the overall effect on participation is negative.

A summary of the combined effects of exchanging the definitions of the tax unit and the parental leave benefit at the same time (simulations A3 and G3) is presented in Figure 7. This joint effect approximately equals the sum of simulations A1 and A2 and G1 and G2, respectively.²³ The full-time participation rate of Austrian mothers would be reduced by 1.2 percentage points, while that of German mothers would increase by 1.4 percentage points. Given the observed difference in full-time participation rates of 13.3 percentage points between Austrian and German mothers, we conclude that these two institutional characteristics can explain about 20 per cent of the difference in full-time participation among mothers with children under 10 years old.

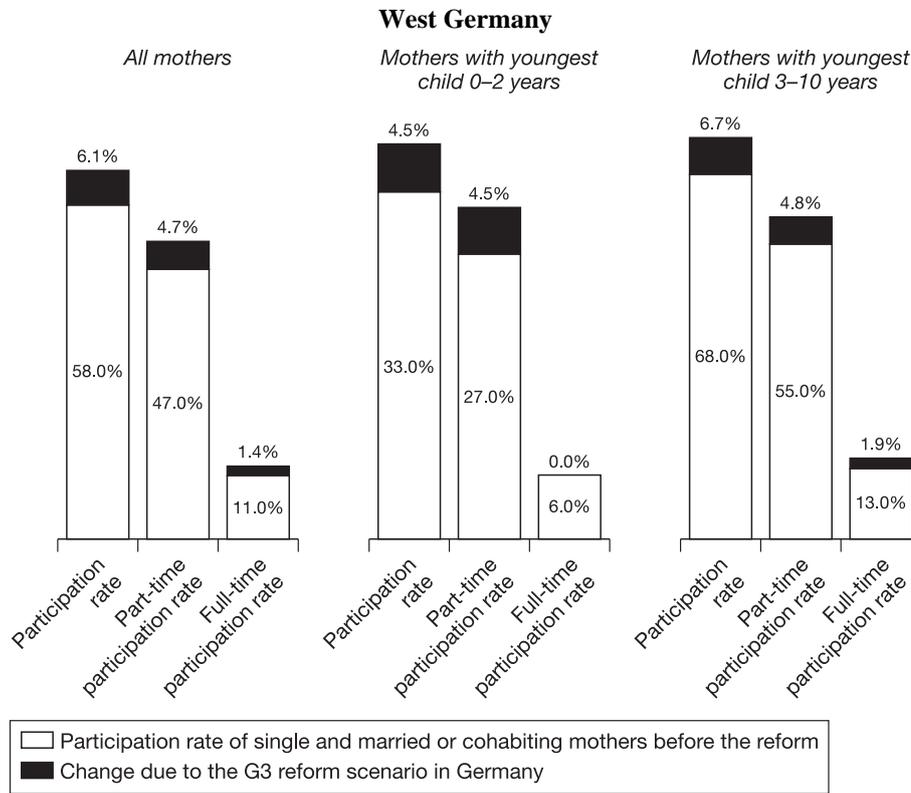
FIGURE 7

Simulation results: labour supply effects of simulations A3 and G3



²³This is not necessarily the case considering the highly non-linear character of the simulations.

FIGURE 7 continued



Sources: ITABENA based on Austrian version of SILC 2004; STSM based on SOEP 2004.

IV. Discussion

As we have seen in the previous section, our simulation exercise shows that about 20 per cent of the difference in full-time participation rates of mothers with children up to 10 years old in Austria and Germany can be explained by differences in the taxation of married couples and parental leave benefit schemes. This raises the question of what other factors are driving the remaining 80 per cent of this difference.

First of all, there are several technical issues related to the fact that we were not able to model the full extent of institutional differences. Most importantly, features of tax relief for marginal employment earnings (earnings up to €400), which are exempt from social security contributions as well as income taxation, were disregarded. As has been illustrated in the graphs in Section II, marginal employment is relatively attractive for married mothers under a joint income tax system compared with other part-time

categories. However, the point of earnings around €400 could not be depicted in our empirical labour supply model due to data restrictions. Thus we underestimate the extent to which Austrian women would increase marginal employment and thus decrease full-time employment somewhat.

Second, we have changed only the definition of the tax unit in simulations A1, G1, A3 and G3, not the income tax tariff. The form of the income tax tariff, however, also influences the magnitude of the tax gain from income splitting. Because the German income tax tariff is more progressive than the Austrian one over a large range of taxable income, the ‘splitting gain’ is lower in Austria than in Germany.²⁴ Thus, changing the definition of the tax unit affects married couples in Austria less than those in Germany.

Other potential reasons for differences in employment patterns relate to the gender wage gap and to the long-term effects of career interruptions or periods of part-time work. Several comparative studies show that Austria and Germany have similarly high gender wage gaps. Blau and Kahn (2003) calculate a total gender wage gap of 29 per cent for Austria and 32 per cent for Germany based on data from the period 1985–94. A more recent comparative study using data from 1998 reports a raw gender wage gap of 20.1 per cent in Austria and 21.0 per cent in Germany (Beblo et al., 2003). Even if the gender wage gap is similar for both countries, there could be a difference in the family wage gap, i.e. the wage gap between mothers and non-mothers. There are not many comparative studies on the family wage gap, and to the best of our knowledge there is only one (Dupuy and Fernandez-Kranz, 2007) that includes Austria and Germany. Dupuy and Fernandez-Kranz, however, do not report separate figures on family pay gaps for every single country but group Austria and Germany into one cluster of countries with similar institutions and report an average family gap of 24 per cent for the whole group (which also includes France, Belgium, Switzerland and the Netherlands).

One reason for the family wage gap is the wage penalty for career interruptions. There are several studies focusing on the effect of child-related career interruptions on wages (for example, Beblo, Bender and Wolf (2006)); however, there are none for Austria. The same applies to the so-called ‘part-time’ wage penalty. For Germany, McGinnity and McManus (2007) show that the part-time wage gap is low compared with the US or Britain. Unfortunately, there is no comparative evidence for Austria.

Differences in labour demand might be another explanation of differences in observed employment patterns. For example, one could imagine mothers

²⁴For example, in 2003, the ‘splitting advantage’ of a single-earner couple with a taxable income of €40,000 per year amounted to €3,676 in Germany but only to €3,211 in Austria. Single-earner couples with a taxable income of €50,000 or €60,000 had a splitting advantage of €4,926 or €6,366, respectively, in Germany but of only €3,671 or €4,403, respectively, in Austria.

in Austria who would prefer part-time jobs but have to take full-time jobs because part-time jobs are not available. If this were the case, we would expect a similar distribution of desired working hours in both countries. However, as an international comparison of desired weekly working hours shows (Fagan, 2003), 29 per cent of women in Austria state that their desired weekly working hours are 40 or more, while this share only amounts to 21 per cent in Germany. On the other hand, only 9 per cent of Austrian women state that they would be willing to work less than 20 hours per week, while this is true for 14 per cent in Germany.

Finally, the 'exchange' of the income tax systems between the two countries – i.e. the introduction of individual taxation in Germany and the switch to joint taxation with full income splitting in Austria – would affect not only labour supply but also the fiscal budget. For Germany, Bach et al. (2003) have shown that the abolition of joint taxation with income splitting would lead to an increase in income tax revenues of about €22 billion per year, which is about 10 per cent of total income tax revenues in Germany. Accordingly, Austria would face a loss in income tax revenues if it introduced the German system for taxing married couples. For a comprehensive assessment of the economic effects of these reforms, the fiscal effects would need to be considered. If one did not resort to lump-sum taxes and transfers, which would hardly affect individuals' labour supply because the substitution effect dominates the relatively small income effect (Wrohlich, 2007), then the tax code should become less progressive in Germany and more progressive in Austria. These changes of the tax code would, in turn, lead to a further reduction in labour supply in Austria and to a higher increase in Germany, thus explaining a larger part of the difference.

V. Summary and conclusions

Employment patterns of mothers with young children differ considerably across European countries. These differences have often been attributed to institutional characteristics, in particular the work incentives created by the tax-transfer system and childcare institutions. In this paper, we compare two countries – Germany and Austria – that can both be defined as corporatist welfare states. Moreover, the general support for families through family allowances as well as costs and availability of childcare are very similar in both countries. Still, we find strong differences in mothers' employment behaviour, in particular for mothers with children aged 3 to 10 years: while participation rates are similar in both countries, full-time employment rates are much higher in Austria than in Germany. The large majority of working mothers in Germany are engaged in marginal and part-time employment.

A closer look at institutional differences between the two countries shows that the differences in employment patterns can partly be explained by the

different work incentive structures implied by the tax–transfer systems. Two characteristics of the tax–transfer system affect mothers’ employment decisions in a significant way. The definition of the tax unit for the personal income tax determines the marginal tax rate for secondary earners and is thus a crucial parameter affecting the work incentive structure. For mothers with very young children, the regulations concerning the parental leave benefit, such as the amount, maximum duration period, income threshold and withdrawal rates, are important as well. Austria and Germany have very different regulations as far as these two institutional characteristics are concerned. While in Germany married spouses are taxed jointly and are eligible for full income splitting, Austria has a system of individual taxation. On the other hand, Austria has a much more generous parental leave benefit scheme than Germany. The Austrian benefit is higher and granted for a longer period. Moreover, the income threshold is defined at the individual level in Austria whereas the benefit is tested against household income in Germany.

We use a structural labour supply model based on tax–transfer models for Austria and Germany to test whether these two characteristics of the tax–transfer system can explain labour supply differences in these countries. Our results show that the labour force participation of German mothers would rise considerably if Germany were to introduce Austria’s income tax and parental leave benefit characteristics. In Austria, a small share of mothers would withdraw from the labour market if they were exposed to the German institutional environment. Since the labour force participation rates of mothers are very similar under the status quo in both countries, it can be concluded that German mothers seem to have stronger preferences for participating in the labour market, given the lower work incentives induced by the German system. However, most of the German mothers who would choose to take up a job if they were exposed to the Austrian income taxation and parental leave benefit system would prefer to work part-time. If the two countries were to exchange these institutional characteristics, the difference in the full-time participation rate of mothers would decrease only by roughly 20 per cent.

Based on our empirical results, we therefore conclude that part of the differences in employment patterns can in fact be explained by the different work incentives created by the tax–benefit system. However, there is a remaining part of the differences that cannot be explained by merely changing particular institutional characteristics. The empirical distribution of wages, childcare costs and, not least, preferences for part-time and full-time work in the presence of young children also play an important role.

Appendix A. Tables

TABLE A1
Descriptive statistics

	Austria		Germany	
	<i>Number</i>	<i>Per cent</i>	<i>Number</i>	<i>Per cent</i>
Households	846	100	1,322	100
Couples: total	733	87	1,195	90
Couples: married	673	80	1,131	86
Couples: cohabiting	60	7	64	5
Singles	113	13	127	10
Youngest child aged 0–2	316	37	386	29
Youngest child aged 3–6	265	31	490	37
Youngest child aged 7–10	265	31	446	34

	Austria		Germany	
	<i>Mean</i>	<i>Standard deviation</i>	<i>Mean</i>	<i>Standard deviation</i>
Age of the father (if present)	37.3	7.2	39.3	6.3
Age of the mother	34.0	6.3	36.4	5.8
No. of children up to age 10	1.5	0.6	1.5	0.7
Mother of German/Austrian nationality	0.88	–	0.86	–
Mother holds high-school degree	0.27	–	0.29	–

Sources: ITABENA based on Austrian version of SILC 2004; STSM based on SOEP 2004.

TABLE A2
Estimation results: conditional logit models

<i>Variable</i>	<i>Austria</i>	<i>Germany</i>
Net income	0.1047 (0.033)	0.0006 (0.001)
Leisure	–0.0802 (0.030)	0.1983 (0.026)
Net income squared	–0.0001 (0.000)	0.0001 (0.001)
Leisure squared	0.0007 (0.000)	–0.0014 (0.000)
Leisure × Net income	–	0.0001 (0.001)
Leisure × No. of children aged 0–2	0.0396 (0.006)	0.0351 (0.006)
Leisure × No. of children aged 0–10	0.0204 (0.005)	0.0055 (0.005)
Leisure × Single	–0.0297 (0.008)	–0.0096 (0.008)
Leisure × Education (high-school)	–0.0149 (0.006)	0.0012 (0.007)
Leisure × Mother holds German nationality	–	–0.0121 (0.008)
Number of observations	846	1,322
Log likelihood	–764.4	–1,150.9
LR χ^2	330.0	602.8

Note: Numbers in parentheses are standard errors.

Sources: ITABENA based on Austrian version of SILC 2004; STSM based on SOEP 2004.

TABLE A3
Simulation results: labour supply effects

Austria

	<i>A1: income splitting</i>	<i>A2: German parental leave benefit</i>	<i>A3: both</i>
	<i>Change in labour force participation rate (percentage points)</i>		
All mothers	-2.39 (-2.52, -2.26)	-0.21 (-0.31, -0.10)	-2.61 (-2.76, -2.46)
Mothers with youngest child aged 0–2	-1.75 (-1.95, -1.56)	-0.55 (-0.84, -0.26)	-2.34 (-2.59, -2.08)
Mothers with youngest child aged 3–10	-2.77 (-2.92, -2.63)	–	-2.77 (-2.93, -2.62)
	<i>Change in part-time participation rate (percentage points)</i>		
All mothers	-1.02 (-1.09, -0.95)	-0.44 (-0.51, -0.37)	-1.43 (-1.54, -1.32)
Mothers with youngest child aged 0–2	-1.21 (-1.33, -1.09)	-1.17 (-1.37, -0.98)	-2.32 (-2.52, -2.11)
Mothers with youngest child aged 3–10	-0.90 (-0.98, -0.82)	–	-0.90 (-0.98, -0.82)
	<i>Change in full-time participation rate (percentage points)</i>		
All mothers	-1.37 (-1.47, -1.28)	0.23 (0.13, 0.34)	-1.18 (-1.31, -1.05)
Mothers with youngest child aged 0–2	-0.54 (-0.62, -0.47)	0.62 (0.38, 0.87)	-0.02 (-0.24, 0.20)
Mothers with youngest child aged 3–10	-1.87 (-2.00, -1.75)	–	-1.87 (-1.97, -1.77)

Germany

	<i>G1: individual taxation</i>	<i>G2: Austrian parental leave benefit</i>	<i>G3: both</i>
	<i>Change in labour force participation rate (percentage points)</i>		
All mothers	6.78 (5.11, 8.44)	-0.75 (-1.07, -0.42)	6.05 (4.56, 7.53)
Mothers with youngest child aged 0–2	7.02 (5.02, 8.85)	-2.56 (-3.67, -1.45)	4.52 (3.18, 5.86)
Mothers with youngest child aged 3–10	6.67 (4.96, 8.38)	–	6.67 (4.96, 8.38)

Continues opposite

Germany continued

	<i>G1: individual taxation</i>	<i>G2: Austrian parental leave benefit</i>	<i>G3: both</i>
	<i>Change in part-time participation rate (percentage points)</i>		
All mothers	5.18 (3.75, 6.61)	-0.55 (-0.84, -0.26)	4.69 (3.39, 5.99)
Mothers with youngest child aged 0–2	6.23 (4.62, 7.83)	-1.89 (-2.89, -0.90)	4.54 (3.19, 5.88)
Mothers with youngest child aged 3–10	4.75 (3.28, 6.22)	–	4.75 (3.28, 6.22)
	<i>Change in full-time participation rate (percentage points)</i>		
All mothers	1.60 (1.19, 2.00)	-0.19 (-0.27, -0.12)	1.36 (1.02, 1.70)
Mothers with youngest child aged 0–2	0.80 (0.46, 1.14)	-0.66 (-0.94, -0.40)	-0.02 (-0.14, 0.11)
Mothers with youngest child aged 3–10	1.92 (1.44, 2.40)	–	1.92 (1.45, 2.40)

Note: Numbers in parentheses refer to 95 per cent confidence intervals derived using the bootstrap method (100 repetitions).

Sources: ITABENA based on Austrian version of SILC 2004; STSM based on SOEP 2004.

Appendix B. Calculating ‘expected costs of childcare’

An adequate measure of childcare costs used in the estimation of mothers' labour supply has to take into account that centre-based childcare (which is subsidised in almost 100 per cent of cases in Austria and Germany) is potentially rationed. Thus we argue that it cannot be assumed that all families could purchase childcare at the average parental fee for subsidised childcare. Rather, we need to use a measure that takes the excess demand for childcare explicitly into account. This can be done by defining childcare costs as a weighted average of the subsidised fee and the private costs of childcare. Formally, this can be stated as follows for part-time childcare:

$$(B1) \quad ec_{pt} = c_{pt}^s (p_{pt} + p_{ft}) + c_{pt}^{ns} (1 - p_{pt} - p_{ft}).$$

The expected costs of part-time childcare, ec_{pt} , consist of the parental fee for a subsidised childcare slot, c_{pt}^s , and a market (non-subsidised) price for childcare charged by a childminder, c_{pt}^{ns} , weighted by the probability of getting a subsidised part-time (p_{pt}) or full-time (p_{ft}) childcare slot. This probability takes into account that full-time slots are available for parents requesting a part-time slot at the cost of a part-time slot.

For full-time childcare, parents face three possibilities: either they get a subsidised full-time slot at cost c_{ft}^s ; or they get a subsidised part-time slot at cost c_{pt}^s and have to use non-subsidised childcare at cost c_{pt}^{ns} for the other half of the day; or no subsidised childcare is available and they have to demand a full-time private childcare slot at cost c_{ft}^{ns} . These three options are weighted by their probabilities in the following equation, which gives the expected costs of full-time childcare, ec_{ft} .²⁵

$$(B2) \quad ec_{ft} = c_{ft}^s p_{ft} + (c_{pt}^s + c_{pt}^{ns}) p_{pt} + c_{ft}^{ns} (1 - p_{pt} - p_{ft}).$$

The probability of getting a childcare slot is the ratio of ‘actual’ supply and demand, where supply is defined as the number of slots in institutional childcare facilities.²⁶ In order to approximate the demand for childcare, we take the total number of children in the respective age group times a factor that takes into account that not all parents claim non-domestic childcare for their children.

The monthly parental fee for childcare in a subsidised facility (c_{pt}^s and c_{ft}^s in equations (B1) and (B2)) is calculated for Germany on the basis of individual information from the SOEP 2002 wave, when parents were asked their monthly childcare expenses. For the Austrian case, we make use of information on the parental fee structure charged by childcare centres in Vienna. We take into account that parental fees are income-dependent. Therefore we apply the following social discounts for Austria (source: Stadt Wien, MA 11A): for income below €828 monthly, no fee has to be paid; for income above €2,198 monthly, the full fee has to be paid; for income between these two amounts, a tapered fee is applied.

It would be more precise to collect prices for each federal state; however, this is difficult, since each federal state has different legislation, including different guidelines for prices. Moreover, within each federal state, prices vary considerably since childcare institutions are in the charge of municipalities, which also do not set prices uniformly. As prices and availability of childcare are higher in Vienna than in other federal states, the bias of taking Viennese settings for public childcare slots cancels out somewhat, as higher prices increase the expected costs while higher availability decreases them.

Finally, we need to calculate the probabilities that children have access to subsidised part-time and full-time childcare (p_{pt} and p_{ft}). This could be done

²⁵For further discussion of this approach, see Wrohlich (2006).

²⁶For Austria, this number is taken from Statistik Austria (2003/04). For Germany, it is taken from Statistisches Bundesamt (2004).

by assuming these probabilities to be equal to the local availability rates of part-time and full-time slots. However, this approach implies the assumption that all parents demand subsidised childcare for all children, which is probably not plausible. Thus, we multiply the availability rate by a factor that takes into account that not all parents claim non-domestic childcare for their children. This factor is calculated as the share of children for whom any sort of non-parental childcare is used, including care by grandparents and other free-of-charge childcare.

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