The Parental Leave Benefit Reform in Germany: Costs and Labour Market Outcomes of Moving towards the Nordic Model

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Abstract

Germany is known to have one of the lowest fertility rates among Western European countries and also relatively low employment rates of mothers with young children. Although these trends have been observed during the last decades, the German public has only recently begun discussing these issues. In order to reverse these trends, the German government recently passed a reform of the parental leave benefit system in line with the model practiced in Nordic countries. The core piece of the reform is the replacement of the existing means-tested parental leave benefit by a wage-dependent benefit for the period of one year. In this paper we simulate fiscal costs and expected labour market outcomes of this reform. Based on a micro-simulation model for Germany we calculate first-round effects, which assume no behavioural changes and second-round effects, where we take labour supply changes into account. Our results show that on average all income groups, couples and single households, benefit from the reform. The calculation of overall costs of the reform shows that the additional costs are moderate. As far as the labour market behaviour of parents is concerned, we find no significant changes of labour market outcomes in the first year after birth. However, in the second year, mothers increase their working hours and labour market participation significantly. Our results suggest that the reform will achieve one of its aims, namely the increase in the labour market participation of mothers with young children.

Key words: female labour supply, parental leave, micro simulation study

1   Introduction

Labour force participation of mothers with very young children is low in Germany, especially in comparison with other Western European countries. The employment rate for mothers with children under three years of age is 48% in Germany compared, for example, to 77% in Sweden (e.g. OECD 2006). These rates have been relatively constant for many years, but public discussion of this issue in Germany is a new phenomenon. Politicians today explicitly state the aim of increasing the labour force participation of mothers with young children[1] and to this end, of increasing their return-to-work rates. Similar observations can be made regarding the low fertility rate: in 2004, Germany as a whole had a 1.34 fertility rate compared to much higher rates in Sweden and France of 1.76 and 1.92, respectively (Hoem 2005). The widespread public discussion of this issue is new as well; and here too, German policymakers are beginning to explicitly state the aim of increasing fertility (see several publications by the Federal Ministry for Family Affairs, e.g. BMFSFJ 2005).

In these public discussions, experts and politicians explicitly take the Nordic countries as a role model. These countries have high employment rates for mothers with young children[2] and among the highest fertility rates in Europe. Given these empirical facts, the German debate is dominated by the belief that Nordic family policies, which provide a high supply of public-financed day care for children and a generous parental leave system are major factors contributing to the higher employment rates of mothers with young children and higher fertility rates there. As far as parental leave is concerned, it is argued in particular that a one-year wage-dependent benefit – which has been granted in the Nordic countries for several years – increases the return-to-work rate of mothers with young children and boots fertility rates by reducing income losses for families immediately after childbirth.

These topics have been assigned such high priority in German social policy that the proposal for a wage-dependent parental leave benefit as found in the Nordic countries emerged as a major topic in the last election campaign. After lengthy public debate, German parliament voted in September 2006 that this benefit would be instituted beginning in January 2007. Apart from a rise in the employment rate of mothers with young children in Germany and an increase in the German fertility rate, the reform also has other major goals that it intends to reach using a Nordic model although some of these are linked to those mentioned above. One is to increase the income of families with small children in a crucial phase of bonding between new parents and child. Here the objective is to provide compensation to middle- and high-income parents, who experience a relatively high income loss due to a birth-related employment break. Furthermore, the reform is intended to increase the percentage of fathers who assume care responsibilities and should thus promote equality of opportunity between women and men. In combination with various efforts on the federal and state levels to increase the supply of publicly funded day care, this reform should help parents generally in combining family responsibilities and employment.

Against this background, the objective of the present paper is to estimate potential implications of the current parental leave reform proposal using a micro-simulation model. We focus on two major aspects: first, the additional public costs of such a reform. Our calculation of these costs is of particular interest, as the German debate on this reform has been dominated thus far by financial concerns that the reform would be too costly. Second, we estimate potential labour supply effects of this reform for mothers and fathers.

Before we describe our data set and the methodological approach in more detail, we first give a brief overview of the current parental leave policy and the proposed changes, comparing them against the Nordic model. We discuss previous research on parental leave issues that is comparable with our analysis; thus we concentrate on empirical studies based on

representative data sets. In chapter four we summarize our empirical strategy and describe our data. Finally, in chapter five, we present and discuss our results, and end by outlining our conclusions.

2   Is Germany Moving towards the Nordic Model?

Maternal and parental leave policies in the Nordic countries have a long history starting at the beginning of the last century. Although there are differences between the Nordic countries (see e.g. Datta Gupta, Smith, and Verner 2006) all these countries share major characteristics. The main feature of the "Nordic model" is a leave period of about one year and a father quota, which reserves a specific time period for fathers to stay home with children. Denmark is the only Nordic country to have abolished the father quota, which it did in 2002. The compensation rates during maternity and parental leave range from an average compensation rate of about 66% of former wages in Denmark, to a maximum in Sweden, Iceland and Norway of 80%. Another common characteristic is the flexibility of leave schemes, some of which allow part-time leave over a longer period instead of full-time leave in a shorter period. Sweden has the most flexible scheme; while those in Denmark and Finland are less flexible (see e.g. Datta Gupta, Smith, and Verner 2006, and Duvander, Ferrarini, and Thalberg 2005).

What does the current German parental leave policy look like and what major changes would the proposed reform entail? The overall model for the current German parental leave and benefit policy is the "breadwinner model", which assumes that one parent, usually the mother, stays home, and that the other, usually the father, is the breadwinner for the family (e.g. BMFSFJ 2006a). This is a substantial difference from the Nordic countries, where the policies are embedded in the "dual-earner household model". However, in Germany it is becoming

more and more socially acceptable and desirable for women with younger children to work as well. Today, the existing model can be described as the "one-and-a-half-earner model", where the father usually works full-time and the mother part-time.

Overall the German child-rearing benefit law entitles all mothers or fathers to job protection while on parental leave[3]. The parent who stays at home is provided with a child-rearing benefit, regardless of whether or not this parent worked previously. This benefit is means-tested at the household level. Parents can take parental leave ("Elternzeit") for a maximum of three years. During this period, the parent enjoys job protection. The father and the mother may go on leave consecutively or simultaneously. The child-rearing benefit, however, is not granted for the whole period of protected parental leave. At present, the eligibility period for the child-rearing benefit ends at the child's second birthday. In this respect the German system is similar to that in the Nordic countries, some of which also offer unpaid leave with job protection subsequent to a period of paid leave (see, Datta et al. 2006). All parents who do not work full-time, defined as up to 30 hours per week, are eligible for this benefit up to a maximum of 300 euros per month. The child-rearing benefit is means-tested on the household level with two different income thresholds. In the first six months after the child's birth, the income thresholds up to which the benefit is paid are more generous than for the next 18 months. The child-rearing benefit is tax-free and does not reduce the entitlement to social assistance.

The basic approach of the current reform is to replace the existing means-tested child-rearing benefit ("Erziehungsgeld") with a parental leave benefit ("Elterngeld") that replaces 67% of net earnings for a stay-at-home parent in the first year after birth.[4] This implies a substantial move towards the Nordic model. The maximum benefit will amount to 1,800 euros per month and the minimum to 300 euros per month, the latter intended for low-income parents who did not work before the birth of their child. Furthermore, low-income families with net income

less than 1,000 euros per month receive a higher parental leave benefit: for every 20 euros below this income threshold, the replacement rate is increased by 1%. The new parental leave benefit will be granted for 14 months as compared to the existing child-rearing benefit, which is granted for two years.[5] Again, this is a step towards Nordic policies. In fact, the parental benefit will only be granted for 14 months if the two parents share the parental leave: the maximum duration for each parent is 12 months and the joint duration is 14 months. This "father quota" has been widely criticized in the German discussion on the reform proposal. Opponents argue that a father quota constitutes too much intervention into parents' private decisions on time allocation.

There will be no working hours restriction on eligibility under the reform in contrast to the present scheme, which only provides benefits to parents who work less than 30 hours per week. However, since the benefit is designed to replace foregone earnings due to child rearing, it is decreased according to working hours. While the full amount of the benefit is paid to parents who do not work at all, parents who reduce pre-birth working hours by 50% receive half of the benefit. Parents can also share the benefit, e.g. the two parents can work part-time and each then receives half of the benefit. However the benefit is calculated covering no more than 40 working hours per week. This implies that it is impossible for both parents to stop working completely and receive the full benefit. In contrast to the current child-rearing benefit, which is granted in addition to social assistance, the parent's benefit will be counted as income within the social assistance scheme. If a second child is born in the time frame of 36 months, a "speed premium" is paid, which is one element of the parental leave policy in Sweden as well (see, Duvander, Ferrarini, and Thalbergh 2005).

3 Previous Research on the Effects of Parental Leave Regulations

There is a relatively broad literature studying the effect of parental leave policies. While there is a relatively extensive literature on labour market outcomes and the return-to-work decision of young mothers, fewer studies exist on the direct link between parental leave policies and fertility (e.g., Hoem, Prskawetz, and Neyer 2001 and Büttner and Lutz 1990) and on gender equality and other issues (see, Duvander and Andersson 2006, Ekberg, Eriksson, and Friebel 2005, Oláh 2003 and Brunning and Plantenga 1999)[6].

Among the studies that focus on labour market outcomes, a first group of papers is based on US data. Given the very different institutional setting in respect to family policy and in particular to parental leave policy, these studies should be interpreted carefully in a European context. The empirical evidence concerning the relationship between parental leave policies in the US and labour market outcomes is mixed. Some studies (see, e.g. Klerman and Leibowitz 1997, 1999, and Baum 2003) do not find a significant relationship, while others find that there is a significant relationship between maternity leave coverage and mothers' labour force participation – for example, Berger and Waldfogel (2004), Waldfogel (1998), Hashimoto, Percy, Schoellner and Weinberg (2004), and the international comparative study by Waldfogel, Higuchi, and Abe (1999).

There are two groups of studies with a European focus: one group using macro data and a second using micro data. The studies by Ruhm (1998) and Ruhm and Teague (1997) are examples from the first group of studies. They show that women's attachment to the labour force increases with the duration of parental leave benefits. The study by Datta Gupta, Smith, and Verner (2006) focuses on the question of whether the Nordic Model should be aspired to.

On the macro-level they look at female labour force participation rates and other outcomes. They find mixed results in comparison to other countries with a less family-friendly policy. An important study from the second group using micro data is the Swedish-Danish comparison by Pylkkänen and Smith (2004). They show that the impact of parental leave and other family policies has a strong impact on mothers' career interruptions in both of these countries. Rönsen and Sundström (1996) study the employment activity of young mothers in Norway and Sweden. They find that the right to paid maternity leave with job protection greatly speeds up the return to employment, and that women who have this right are much more likely to resume employment. Extensions of leave schemes and the so-called Swedish "speed-premium" on the next birth have delayed the return to work, however. The empirical study from Denmark and Sweden by Albrecht, Edin, Sundström, and Vroman (1999) finds very small long-run effects on subsequent earnings for mothers who entered formal maternity leave. Lalive and Zweimüller (2005) study the effect of the Austrian Parental Leave reform on return-to-work and fertility based on social security data. They find a strong effect of parental leave rules on mothers' return-to-work behaviour. For each additional month of maximum parental leave duration, mothers' time off work is reduced by 0.4 to 0.5 months. Gutierrez-Domenech (2005) investigates transitions from employment to no employment after motherhood in five European countries (Belgium, West Germany, Italy, Spain and Sweden) using data from the Family and Fertility Survey. The paper includes a special section on the evaluation of the different relevant policies such as maternity leave. Her results show that the variable for maternity leave does not have a significant impact on the evolution of post-birth employment.[7]

Empirical studies focusing on Germany deal with the role of parental leave policies to labour market outcomes as well. Several studies by Ondrich, Spiess, Wagner, and Yang, based on the German Socio-Economic Panel Study (GSOEP), show that various parental leave policies

in Germany observed since the early eighties affect mothers' returns to employment. An initial study by Ondrich, Spiess, and Yang (1996) shows that mothers on parental leave are less likely to return to work the longer the time remaining in the leave protection period – a result that cannot, however, be attributed generally to high levels of maternity benefits. Ondrich, Spiess, Wagner, and Yang (1999) show that changes in maximum leave durations in 1980s had a significant effect on the time that mothers spent with their child. The subsequent paper by Ondrich, Spiess, Wagner, and Yang (2003) demonstrates that the increases in parental leave duration are consistent with the hypothesis that employment conditions or career expectations frequently change for mothers taking longer leaves. Ondrich, Spiess, and Yang (2003) show that taking leave negatively affects wage growth in both periods of parental leave policy regimes defined in the paper. Estimates imply that each month of maternity leave reduced wage growth by 1.5% over five years. Another paper based on the GSOEP data by Weber (2004) also shows that the extension of parental leave and an increase in the benefit resulted in a lower return-to-work rate of mothers with young children in Germany.

4   Empirical Strategy and Data

In order to assess the effects of the parental leave reform in Germany described in Section 2 in terms of fiscal costs and work incentives, we use a behavioural micro-simulation model. The advantage of using micro-simulation models for policy assessment is that they make it possible to make evaluations from ex-ante perspective. In particular, these models can be used to calculate "first-round" effects, i.e., effects that the reform has on net household incomes or – on the aggregate level – on fiscal costs, before households react to the reform and change their employment behaviour. Using an empirically estimated behavioural model of labour

supply, the "second-round" effects can be estimated, i.e., the behavioural changes that result from the reform and how these changes affect income tax revenues and social security contributions.

Behavioural micro-simulation models consist of three parts. First, a representative micro data set is needed that contains all relevant information on household structure, income from different sources, working hours, and socio-demographic characteristics. The second part consists of a tax-benefit calculator that computes net household incomes for each household in the data set on the basis of information on gross incomes. With this calculator, it is possible to compute net household incomes not only under the current legislation but also for different hypothetical laws. In particular, it is possible to compare actual net household incomes to those that would result from such policy reforms as a change of the parental leave benefit scheme. Finally, the micro-simulation model contains a behavioural model – in our case, a model of parental labour supply.

For the analysis of the effects of the parental leave reform in Germany we employ the micro-simulation model STSM ("Steuer- und Transfersimulationsmodell").[8] This model is based on data from the German Socio-Economic Panel Study (GSOEP). The GSOEP is a representative sample of private households living in Germany. It provides information on all household members.[9] For our analysis we pool three consecutive waves of the GSOEP, 2001 to 2003. We do so to attain a large enough sample for our estimations. In each year, we only take households with at least one child aged less than 24 months. This leaves us with a sample of 995 households. On average, 57% of mothers in two-parent families and 49% of single mothers were working prior the birth of their child. Three months after birth, the labour market participation rates of mothers were 13%. Further descriptive statistics can be found in the Appendix.

The model of parental labour supply we use is based on a standard household utility model, where it is assumed that utility depends on household income and leisure of the adult family members. A detailed description and motivation of the econometrics of the behavioural model is given in Steiner and Wrohlich (2004 and 2006). Our estimation of the parameters of the utility function is based on a discrete choice model of 11 choice categories, such as father working full-time, non-working mother, both parents working part-time, etc. For a description of these categories and more information about the estimations, see the Appendix. The underlying assumption is that households compare the utility of different combinations of working hours and net household incomes and choose the combination that yields the highest utility. The net household incomes in the different working hour categories are calculated using the tax-benefit calculator mentioned above. After estimation of the behavioural model, the parameters of the utility function are used for the prediction of the behavioural changes that result due to the income changes implied by the reform. The Appendix includes tables summarizing the descriptive statistics and the estimation results.

Due to data limitations and restrictions in the model, we were not able to simulate every detail of the current reform proposal.[10] Nevertheless, all substantial changes, such as a shorter period of wage benefits, could be taken into account.

5   Results

Results of the first-round effects. In a first step, we use the tax-benefit calculator to compute the income changes due to the parental leave reform for all families with at least one child less than 12 months. This sample consists of 762 households, of which 710 are two-parent families and 52 are single-parent families. We restrict the sample to these 762 families, as they are the relevant group who will potentially benefit from the reform. No simulations are

needed to learn that parents with older children who are on parental leave in the second year of a child's life will either experience no changes, because they were not eligible for a benefit anyway, or they will loose, because the benefit is no longer paid. This is a consequence of the attempt to increase the incentives to work.

Table 1 shows the changes due to the benefit reform for different family types and for families in different income groups. The second column shows the absolute amount of the expected benefit, which ranges between 390 euros per month in the lowest income quartile up to 571 euros in the highest income quartile. The third column of the table shows that on average, the monthly income gain for families with a child younger than 12 months is higher for couples than for single parents. On average, couples gain 84 euros more than single-parent households. As can also be seen from Table 1, the gains increase with net household income. The income gains for the fourth quartile of the income distribution are more than three times higher than those in the first income quartile. This is not surprising given that the new parental leave benefit is positively related to earnings before birth, while the existing scheme is a means-tested benefit of maximum 300 euros per month. However, the income gains not only increase with household income in absolute terms, but also in relative terms: In the top quartile, the income gains amount to 9% of net household income, while in the first quartile, the gains amounts to 6%. The percentage of winners from this reform (see last column of Table 1) is much higher among couples than among single households, which is due to the higher income of the former. In the first quartile, 42% of the households in the first quartile of the income distribution benefit from the reform, while in the top quartile, 88% of all households benefit; 10% of all households experience no change at all. Furthermore, a calculation of the loss of income resulting from the reform for the first quartile of the income distribution shows that the losses are moderate, on average around seven euros per month (not shown in Table 1).

[Insert Table 1 about here]

An aggregation of the income changes for each household leads to the overall fiscal costs of the reform, amounting to about 3.5 billion euros per year. As a comparison, the costs for the current parental leave scheme amount to about 3 billion euros per year. Thus, the concern that the reform would lead to a marked increase in public expenditures seems unjustified. However, if people adjust their behaviour accordingly and in particular postpone childbirth until after an employment spell, the costs could rise. Moreover, if the number of first births increases due to this reform, this behavioural effect would also increase the fiscal costs. These two effects have not been modelled so far.

Results of the second-round effects. The results of the estimation of labour supply reactions due to the reform are summarised in Table 2. We do not find significant changes in labour supply of mothers with children less than one year of age. Fathers, however, show a small, but significant increase in working hours in this first year. Thus, the expectation of policy makers that the reform will result in an increasing number of fathers taking parental leave in the first year of the child's life is not supported by our results. In contrast, fathers' working hours would even increase slightly. This is due to the fact that the negative work incentive that results from the current means-tested parental leave benefit scheme is not present under the new scheme. Note, however, that the proposed father quota is not modelled. Furthermore, the experience with the existing quotas tells us that on average, fathers do not extend their leave period beyond the allotted fatherhood months (Datta Gupta, Smith, and Verner 2006). Given these results, a substantial change in fathers' working behaviour due to a father quota is not to be expected.

[Insert Table 2 about here]

For mothers whose youngest child is between 12 and 24 months old, however, we find a large significant increase in working hours and labour force participation. In this group, mothers increase working hours by almost 12% on average and their labour force participation rates increase by more than three percentage points. This result suggests that the reform will indeed contribute to reducing the relatively long employment interruptions of German mothers. For fathers, we also find a small increase in working hours and labour force participation. Clearly, the increased labour supply of parents in the second year after birth can be attributed to the reform's abolition of disincentives to work existing under the means-tested parental leave benefit.

The increased labour force participation and the increase in working hours in the second year after childbirth lead to an increase in income taxation and social security contributions. Assuming that all mothers found jobs paid at their pre-birth wages, we find that income taxes would rise by about 100 million euros per year, and employee social security contributions (to the old age pension scheme and health and unemployment insurance) would rise by the same amount. However, these additional revenues are not sufficient to make the reform self-financing. This will pose an even greater problem if the reform results in a larger number of first births, in particular first births by highly educated women with high earnings before childbirth.

6 Conclusions

In this paper we estimate the fiscal costs and the expected labour market outcomes of the current German parental leave reform proposal. The results of the first-round effects show that on average, couples and single parents in all income groups profit from the reform. Nevertheless, it is clear that high-income households benefit more than low-income households from the replacement of a means-tested benefit with a wage-dependent benefit, both in absolute and relative terms. Overall, couples benefit more from the reform than singles. The estimated costs of the reform show that it is not as costly as has been asserted in the public debate. Thus, the overall costs of the reform as a whole, in comparison to the current benefit system, provide no argument against it.

The results of the second-round effect show that the reform will not change the labour market participation of mothers in their child's first year of life. For fathers, no substantial changes are expected either. However, in the second year of a child's life, the reform will induce a 12% increase in the working hours of mothers. The participation rate will increase from 36% to 39%. Given that fathers' participation rates are high in any case, the changes that occur in the second year are small. The reform aims to increase the labour market participation of mothers with young children, and our simulation results show that this objective can be reached. Compared to other policy reforms, such as decreasing the fees parents pay for child care facilities or introducing a child component into the German income tax splitting provisions for married couples as done in France, the labour supply effect induced by the current parental leave reform is quite large (for a simulation of the other policy changes, see Wrohlich 2006b and Steiner and Wrohlich 2006). Increasing the availability of subsidized childcare facilities for children less than three years with working mothers, however, has been

shown to lead to an effect of similar size (Wrohlich 2006b). Apart from this, the increase in mothers' labour force participation leads to an increase in income taxes and social security contributions amounting to a total of about 200 million euros per year.

Our results provide evidence on effects of the reform addressing issues raised in the debate surrounding its development and introduction. First, the additional costs of the reform are moderate. Second, the minimum amount of 300 euros makes it possible to reduce the group of "losers" from the reform among low-income families, and most importantly, for the first quartile of the income distribution it results in a moderate income loss. In the German debate this was and still is an important issue, as some pressure groups have argued that the reform puts low-income households at a disadvantage relative to those higher up the income distribution. One limitation of our study, however, is that we are not able to predict the behavioural changes that will result from different fertility decisions. Thus, the calculations of fiscal costs have to be seen as a lower bound: if a considerable share of couples decide to have a child after the reform has been introduced, the fiscal costs will rise.

The success of the reform overall will of course depend on other issues as well. The reduction of the benefit period and the expected increase in the labour market participation of mothers with young children is not linked just to existing labour demand but also to the provision of childcare. If no formal and informal care substitutes are available, parents may be unable to work. With respect to formal childcare, in east Germany there currently exist numerous institutional alternatives to parental care. In 2005/2006 for every 100 children below the age of three, there existed 40 slots in childcare centres. The situation is very different in West Germany, where in 2005/2006 there were only about 10 slots per 100 children in the same age group (BMFSFJ 2006c). Informal care, for example by relatives, thus offers one of the few possibilities for mothers of young children to combine work and family. Nevertheless with increasing female labour force participation and an increasing distance between the

households of grandparents and parents, in the future these substitution possibilities will not be a realistic alternative for the majority of families (Büchel und Spiess 2002). The German government is aware of the fact that in the west, not enough day care is provided to combine work and family. Therefore the previous government already started various initiatives to improve the situation. But not much money is available for such improvements and at the moment, it is not clear whether such initiatives will substantially improve the situation in the short term (see Wrohlich 2006b). This will be necessary if the parental leave reform is to get off to a successful start in 2007.

Apart from this, the success of such a reform with respect to a better combination of work and family duties, a more equal division of these tasks between men and women, and an increase in the German fertility rate cannot be judged solely by an evaluation of the parental leave reform itself. In the long run, it is the overall family policy mix that will explain broader social outcomes. The Nordic countries in particular demonstrate that a coherent set of family policies is needed to reach goals like those currently under discussion. A change in the parental leave along the lines of the one proposed might be a step in the right direction. Nevertheless, this step must be an element of a broader set of policy changes covering such policies as an increase in the provision of publicly subsidized child care, changes in the tax system and greater flexibility of work and working hours (see, e.g. BMFSFJ 2006a).

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7 Appendix

Formal description of the labour supply model, data and estimation procedure

The labour supply model used for the estimation of the behavioural effects resulting from the parental leave benefit reform is a structural household utility model. Household utility is assumed to be a function of net household income, the leisure of the mother and the leisure of the father. The estimation of the utility function is based on a discrete choice model. The underlying assumption is that households compare the utility U of J number of different choice categories, i.e. combinations of working hours and net household incomes, and choose the combination, which yields the highest utility.[11]

We follow van Soest (1995) and specify the household utility function as a trans-log function, i.e.

$$U_k(x_k) = x_k' A x_k + \beta' x_k + \varepsilon_k \tag{1}$$

where U_k is the utility of the household in choice category k and the vector x contains the linear, quadratic and cross terms of the natural logs of net income, leisure of the mother and leisure of the father. Matrix A contains the coefficients of the cross and quadratic terms, vector β contains the coefficients of the linear terms and ε is a stochastic error term.

Assuming that households maximize utility, they choose category k if the utility in this choice category is greater than in all other categories. In probability terms, this decision rule can be stated as follows:

$$P(U_k > U_l) = P\big((x_k' A x_k + \beta' x_k) - (x_l' A x_l + \beta' x_l) > \varepsilon_l - \varepsilon_k\big) \tag{2}$$

Assuming that the error terms ε are independently and identically distributed over all choice categories and follow an extreme value distribution, the probability to choose category k as stated in equation (2) can be estimated using the conditional logit model (McFadden 1973):

$$P(U_k > U_l) = \frac{\exp(x_k' A x_k + \beta' x_k)}{\sum_{j=1}^{J} \exp(x_j' A x_j + \beta' x_j)}, \ \forall l \neq k \tag{3}$$

In order to include individual or household specific characteristics, we also include interaction terms between these characteristics and leisure. These characteristics are age of the mother, age of the father, age of the youngest child, number of children and a dummy variable indicating whether the household is living in east Germany (see Table A.3).

For the estimation of the labour supply model, we include two-parent families (either married or cohabiting couples) who have at least one child less than 24 months. We exclude single parents because it seems plausible that the parameters of their utility function would differ from those of two-parent families. Unfortunately, we do not have enough observations to estimate a separate regression for single parents, who make up about 10% of our sample. Thus, our results refer to two-parent families only. We further exclude households in which one of the parents is still in education, self-employed or severely disabled. As we pool observations from three periods (2001-2003), some households enter the sample in two periods. We assume that the error terms are independently and identically distributed following an extreme value distribution, as specified above.

Table A.1 shows the distribution of households in our sample for the estimation of the labour supply equation across choice categories. The definition of the hours categories is motivated by both economic considerations and the actual distribution of hours in the sample. Although a relatively fine aggregation of hours into categories seems desirable in order to realistically

approximate the household's budget constraint, the actual distribution of hours in the sample severely restricts the number of possible categories. Furthermore, for couples, the feasible number of categories is not only restricted by the distribution of hours within one gender, but by the bivariate distribution of the two spouses' working hours. For example, we observe few men in our sample who are either not working or are working part-time. Thus, for these two working categories of men, we define only two working hours categories for women, non-working and working.

[Insert Table A1 about here]

Table A.2 presents further descriptive characteristics such as net household income, age of the parents and number of children in each hours category.

[Insert Table A2 about here]

The results of the labour supply estimations are presented in Table A.3.

[Insert Table A3 about here]

Table 1: Changes in net household income due to the reform

	Mean net income before the reform (status quo) in euros per month	Mean amount of the parental leave benefit after the reform in euros per month	Mean income change due to the reform in euros per month	Percentage of households whose income is increasing due to the reform
All two-parent families	3,182	464	246	73
All single-parent families	1,767	413	162	42
Households in the 1st quartile*	1,732	390	117	42
Households in the 2nd quartile	2,479	402	124	64
Households in the 3rd quartile	3,173	472	256	87
Households in the 4th quartile	4,799	571	455	88

* Deciles are defined for all households with at least one child less than 12 months of age. Income is defined as net household income in the year when the child is born.

Source: Own calculations based on GSOEP, waves 2001-2003, and STSM.

Table 2: Changes in labour supply due to the reform

	Mothers (m)	Fathers (f)
	Change in Working Hours (in %)	
Families with youngest child < 12 months *(Baselines: m 2.7 hours/week; f 36.5 hours/week)*	-2.7 (-7.9 – 2.5)*	1.1 (0.4 – 1.8)*
Families with youngest child 12-24 months *(Baselines: m 6.8 hours/week; f 38.7 hours/week)*	11.7 (5.7 – 17.7)*	2.0 (1.1 – 2.9)*
	Change in Participation Rates (in %-points)	
Families with youngest child < 12 months *(Baselines: m 12%; f 89%)*	-0.3 (-0.9 – 0.4)*	0.4 (0 – 0.7)*
Families with youngest child 12-24 months *(Baselines: m 36%; f 93%)*	3.3 (1.8 – 4.7)*	1.0 (0.5 – 1.5)*

* The 95% confidence interval (bootstrap method) is given in parentheses.

Source: authors' calculations based on GSOEP, waves 2001-2003 and STSM.

Table A.1: Sample size and distribution of households across choice categories

choice category	working hours of the mother (average hours in brackets)	working hours of the father (average hours in brackets)	absolute frequency	relative frequency in %
1	non-working (0)	non-working (0)	70	7.04
2	working (30)	non-working (0)	22	2.21
3	non-working (0)	part-time (23)	14	1.41
4	working (27)	part-time (22)	11	1.11
5	non-working (0)	full-time (39)	391	39.30
6	marginal employment (9)	full-time (39)	49	4.92
7	part-time (21)	full-time (39)	47	4.72
8	full-time or overtime (39)	full-time or overtime (43)	31	3.12
9	non-working (0)	overtime (46)	284	28.54
10	marginal (9)	overtime (46)	41	4.12
11	part-time (22)	overtime (45)	35	3.52
			995	100.00

Source: Own calculations based on GSOEP, waves 2001-2003.

Table A.2: Descriptive statistics of the sample used for the labour supply estimation

choice category	net household income (in Euro per month)	number of children	number of children less than 12 months	age of the mother	age of the father
1	1701	1.97	0.69	28.9	31.9
2	2195	1.86	0.41	31.6	34.8
3	2922	1.57	0.57	34.6	39.6
4	2989	1.46	0.27	34.9	37.6
5	2729	1.84	0.62	31.0	33.6
6	2866	1.65	0.14	31.6	34.7
7	3451	1.43	0.23	31.9	34.4
8	4361	1.90	0.36	33.4	36.1
9	3258	1.93	0.52	32.1	34.5
10	3368	1.56	0.20	32.0	34.4
11	3408	1.60	0.23	32.6	35.3
overall mean	2943	1.82	0.50	31.5	34.2

Source: Own calculations based on GSOEP, waves 2001-2003.

Table A.3: Coefficients of the conditional logit model

	Coefficient	Standard Error
net income	24.83	17.80
net income squared	-0.46	0.77
net income x leisure of the father	-1.29	0.93
net income x leisure of the mother	-1.70	1.03
leisure of the father	68.01	14.00
leisure of the father squared	-2.08	0.66
leisure of the mother	-70.25	18.05
leisure of the mother squared	14.66	1.28
leisure of the father x leisure of the mother	-7.98	1.20
leisure of the father x east	-3.03	6.91
leisure of the mother x east	-5.32	6.19
leisure of the father x leisure of the mother x east	0.58	1.62
net income x east	-15.06	10.81
net income squared x east	0.82	0.71
net income x kid00	-2.60	0.98
net income x 2kids	1.88	1.10
net income x 3kids	3.17	1.30
leisure of the father x age of the father	-0.44	0.22
leisure of the father x age of the father squared	0.01	0.003
leisure of the mother x age of the mother	0.07	0.43
leisure of the mother x age of the mother squared	-0.003	0.01
leisure of the mother x kid00	1.82	0.71
leisure of the father x kid00	-0.20	0.53
leisure of the mother x 2kids	0.48	0.70
leisure of the mother x 3kids	3.07	1.02
leisure of the father x 2kids	1.01	0.61

Log Likelihood: -1788,3059

LR chi2(27): 1194,61

Prob > chi2: 0,000

Note:

x   denotes an interaction term

east   household is living in east Germany

kid00   is a dummy variable indicating that the youngest child is less than 1 year

2kids   is a dummy variable indicating that there are 2 children living in the household

3kids   is a dummy variable indicating that there are 3 or more children living in the household

Source: Own estimations based on GSOEP, waves 2001-2003.

Endnotes:

[1] See the homepage of the Federal Ministry for Family Affairs, http://www.bmfsfj.de/Politikbereiche/Familie/familie-und-arbeitswelt.html.

[2] Note that in some Nordic countries, in particular Sweden and Norway, the number of part-time working mothers is relatively high, however still not as high as among German mothers. For example, in Germany, 60% of all working mothers with two or more children work part-time compared to only 41% in Norway, 22% in Sweden, 16% in Denmark and 14% in Finland (OECD 2002).

[3] Currently, parental leave and benefits are regulated in the child-rearing benefit law ("Bundeserziehungs-geldgesetz"). In addition, there is a special law, the mother protection law ("Mutterschutzgesetz") regulating job-protection and wage-replacement during pregnancy. It also designates the mother protection period, which covers six weeks before and eight weeks after birth.

[4] For the current reform proposal, see BMFSFJ (2006b).

[5] However, parents do have the option to spread the total amount of the parent benefit over 24 instead of 12 months.

[6] For a recently published overview of family policies and fertility in Europe covering gender issues as well, see Neyer (2006).

[7] Other micro-data based studies focus on the effect of overall differences in family policies of various countries on mothers' returns to work. See Gutstafsson, Wetzels, Vlasblom and Dex (1996) as one example.

[8] For more details on the STSM, see Steiner et al. (2005).

[9] See Schupp and Wagner (2002) and www.diw.de/soep for more information on the GSOEP.

[10] This relates in particular to the so-called speed premium and the father quota.

[11] A detailed description and motivation of the model, which follows the approach of van Soest (1995), is given in Steiner and Wrohlich (2004).