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How Would It Affect the Income Distribution and
Work Incentives?**

Berlin, July 2006

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Introducing Family Tax Splitting in Germany:

How Would It Affect the Income Distribution and Work Incentives?

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Abstract:

We analyze the effects of three alternative proposals to reform the taxation of families relative to the current German system of joint taxation of couples and child allowances: a French-type family splitting and two full family splitting proposals. The empirical analysis of the effects of these proposals on the income distribution and on work incentives is based on a behavioral micro-simulation model which integrates an empirical household labor supply model into a detailed tax-benefit model based on the German Socio Economic Panel. Our simulation results show that under each reform the lion's share of the reduction in taxes would accrue to families with children in the upper part of the income distribution, and that expected labor supply effects are small for all analyzed family tax splitting reforms, both in absolute terms and relative to the implied fiscal costs.

Key-Words: Household Taxation, Income Distribution, Work Incentives, Microsimulation

JEL-Classification: H24, H31, J22

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1 Introduction

Tax policy related to families with children is currently on centre stage in the economic policy debate. In Germany, it has been proposed to replace the prevalent system of joint taxation of married couples and the embedded system of child benefits and allowances by some form of family tax splitting whereby the calculation of the income tax would depend on the number of children living in the household. For example, “full family splitting” would imply that household income is divided by the total number of family members (i.e. the parents and dependent children) to calculate the tax rate which is applied to total taxable household income. In contrast, under the current German system of joint taxation of spouses, household income is divided by two and children are taken into account either by granting a child benefit or deducting child allowance, depending on which of the two alternatives is more advantageous to the household.

Proponents of such reforms argue that family tax splitting would allocate more money to families with children as well as reduce the strong disincentives to work for secondary earners that exist under the current system. In particular, critics point out that, first, income splitting is not an adequate means of family policy as it does not subsidize households with children but rather married couples, while increasingly these two groups cease to coincide. Secondly, critics view income splitting as a subsidy to married couples with the traditional division of labor within the household, where the wife as the secondary earner stays at home. In this view, the relatively low labor force participation rate of married women in Germany is closely related to the negative labor supply incentives for secondary earners implied by the tax system.

Whether a family tax splitting system would in fact allocate more money to families and, if so, to which families, depends on several parameters of the system. Of particular importance are the interaction with the existing child benefit and child tax allowance as well as the amount of the splitting factor allocated to each child, and possibly ceilings of the splitting gain. To our knowledge, these parameters have not been addressed in the public debate by any of the proponents of a family tax splitting for Germany, and also the issue of financing potential additional expenditures has not been discussed in much detail.

Previous research has shown that the French family splitting together with French child benefits actually is less generous over a large part of the income distribution than the current German system (see Baclet et al. 2005 and Maiterth 2003). Only in the case of families with

three or more children, is the French system more favorable for a majority of households than the current German system. Regarding work incentives, previous research has shown that introducing a French-style family splitting in Germany would not lead to a marked increase of the labor force participation of married women (see Althammer 2000, Beblo et al. 2004). This is not surprising, since even under a family tax splitting system, incomes of all earners within a family are taxed at the same marginal tax rate, which always leads to negative work incentives for secondary earners (see, among others, Wrede 2003 and Apps and Rees 2003).

In this study, we define three different reform proposals that bound the currently proposed policy reforms, but have not been studied in previous literature yet. The first reform proposal is a French-style family splitting which we adjust to several parameters of the current German system, such as the amount of the child benefit and the maximum tax relief resulting from the child tax allowance. In addition, we simulate two alternatives of a so-called “full family splitting”, where one is without limit to the splitting gain per child, whereas the other limits it to the maximum amount of the tax relief implied under the current German system of child allowances.

We analyze the effects of these reforms on the income distribution and on work incentives on the basis of a behavioral micro-simulation model which integrates an empirical household labor supply model into a detailed tax-benefit model based on the German Socio-Economic Panel (SOEP). Our results show that the lion’s share of the reduction in taxes would accrue to families with children in the upper part of the income distribution, although both the degree of redistribution and the expected fiscal costs vary substantially between the three reform proposals. In particular, under a French-type family splitting the lion’s share of all income gains would be distributed to families in the two top deciles of the income distribution, while more than 70% of all families with children would not gain at all. In case of full family splitting almost half of all income gains would be distributed towards families in the highest income decile. Furthermore, full family splitting would be a relatively expensive option with fiscal costs amounting to almost 13 billion Euro per year. Results of the behavioral simulation show that expected labor supply effects are small for all analyzed family tax splitting reforms, both in absolute terms and relative to the implied fiscal costs.

In the next section, we explain in more detail the current legislation in Germany and define the three different reform proposals under consideration. In section 3 we present the empirical methodology we use to simulate the distribution and labor supply effects of these proposals. In section 4 we summarize and discuss these effects, and section 5 concludes.

2 The Current German System of Family Taxation and Recent Reform Proposals

2.1 The Current System

Under current German legislation married couples as well as parents of dependent children are favorably treated in the taxation of personal incomes relative to unmarried persons or persons without children. Married couples can choose to be taxed jointly and make use of income splitting. This implies that the income tax of a married couple is calculated by applying the tax function to half of the sum of taxable incomes of the spouses, and the resulting amount is then doubled to determine the tax liability of the couple. It also implies that no married couple will pay higher income taxes than a single individual with the same level of household income. Given the progressivity of the income tax, this system leads to a lower tax burden compared to individual taxation if household income is unequally distributed between spouses. This so-called “splitting advantage” is defined as the difference between the amount of income tax a married couple has to pay under income splitting and the amount the same couple would have to pay in case of separate taxation.¹

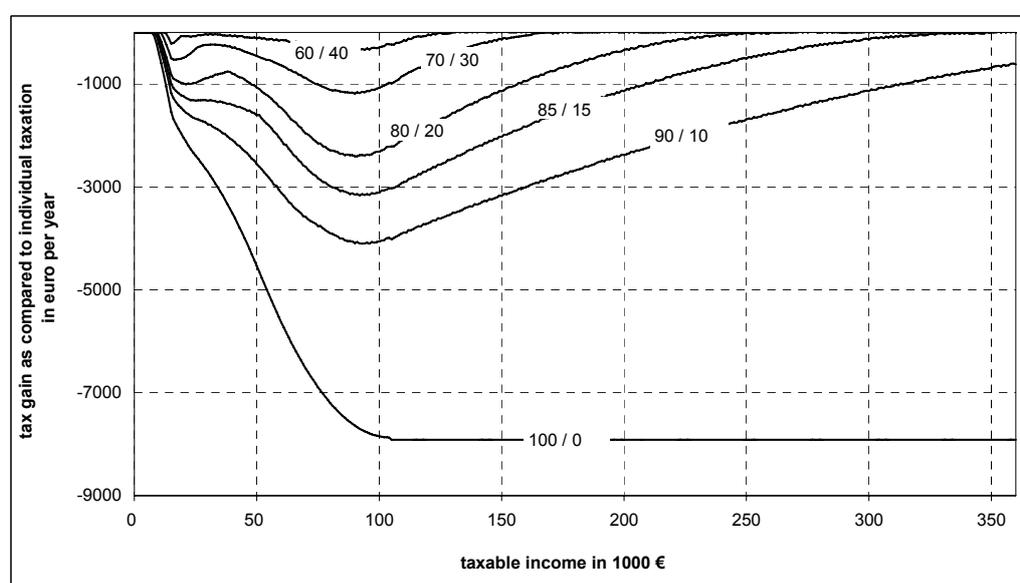
In case of a progressive tax system, the amount of this splitting advantage depends on the income distribution between husband and wife and on the absolute level of household income. At its maximum, the splitting advantage amounts to roughly 8,000 Euro under the 2005 tax tariff, which is reached at a yearly taxable income exceeding 100,000 Euro. The splitting advantage declines quickly with the secondary earner’s share of total taxable household income and becomes zero if both spouses contribute equally to it (see Figure 1). For the fiscal year 2005 the splitting advantage has been estimated to amount to about 22 billion Euro in total, of which about 2/3 were spent on married couples with dependent children (see Bach et al. 2003).

Families with children are granted a universal child benefit of 154 Euro per month (1,848 Euro per year in 2005), which does not depend on income or marital status, and a child tax allowance of 5,848 Euro per year. Child benefit and tax allowance are not granted jointly, however, but according to a so-called higher-yield test (*‘Günstigerprüfung’*): the tax allowance is granted if the resulting amount of the tax relief exceeds the child benefit, and

¹ This „splitting advantage“ can also be viewed as the logical consequence of a progressive income tax in conjunction with the normative requirement that the income tax should not discriminate between married and unmarried persons, and that it should be neutral regarding the distribution of incomes between spouses (see, e.g., Homburg 2000, Spahn et al. 1992).

vice versa. For example, for a married couple with one child the higher-yield test implies that the child benefit exceeds the child tax allowance for all married couples with a taxable income of less than 63,000 Euro per year. Only above this income threshold, which exceeds the 70th percentile of the income distribution, married couples with one child fare better with the tax allowance. The maximum tax relief resulting from the tax allowance, amounting to 2,447 Euro per year, is reached at a taxable yearly income of about 119,000 Euro.

Figure 1: Splitting gain by taxable household income and within-household distribution of incomes in the current German system – 2005 tax tariff



Source: Adapted from Bach et al. (2003).

2.2 Three Reform Proposals

The current German system of joint income taxation of married couples has been under attack for some time, due to its alleged negative distributional and labor supply disincentive effects, and various forms of family tax splitting have recently been proposed to replace this system. However, parameters of a possible alternative to the current German legislation, in particular the amount of the splitting divisor per child, potential ceilings of the splitting gain for children, as well as the interaction of these parameters with the current child benefit and tax allowances, have not been specified by proponents of a reform of the current system of family taxation in Germany yet. This is also true concerning the treatment of single and cohabiting parents as well as the financing of the fiscal costs of reforms. Thus, in the following we present three different reforms that may represent the range of current reform proposals, the

income and labor supply effects of which we will investigate in the empirical part of this paper. The most important parameters of these reforms are summarized in Table 1, and, along with the current legislation, more formally defined in Appendix A.

Table 1: Three alternatives of family tax splitting in Germany

	Reform 1 <i>French-style family splitting</i>	Reform 2 <i>Full family splitting</i>	Reform 3 <i>Full family splitting with ceilings</i>
Splitting factor for a married couple	2	2	2
Splitting factor for children	0.5 for 1 st and 2 nd child, 1 for the 3 rd and every subsequent child	1	1
Splitting factor for single parents	1.5	1	1
Maximum amount of splitting gain for children (in Euro per year)	2,500 for the 1 st and the 2 nd child, 5,000 for the 3 rd and every subsequent child	no limit	2,500 for each child
child tax allowance	abolished	abolished	abolished
child benefit	higher-yield test	higher-yield test	higher-yield test

Note: In the case of unmarried couples, each parent can apply half of the child splitting factors.

Source: Own description.

French-type family splitting

Since the proponents of a family tax splitting for Germany frequently cite France as an example to follow, we simulate the French family splitting for Germany (Reform 1). In the French case, married couples without children are eligible to the same form of income splitting as in Germany, i.e. the splitting divisor for a married couple without children is 2. For the first and the second child, a factor of 0.5 per child is added. For the third and every subsequent child, the splitting divisor increases by 1. This yields a total splitting divisor of 2.5 for a married couple with one child, 3 for a married couple with 2 children and 4 for a married couple with 3 children. However, the splitting gain implied by the child factors is limited to a maximum amount of 2,159 Euro for the first and the second child, and to 4,318 Euro for the third and every subsequent child. Single parents may apply a splitting factor of 1.5 for themselves, and the same factors for children as married couples. In France, child benefits are much lower than in Germany (for a detailed description of the French system, see Baclet et al. 2005), they are granted in addition to the splitting gain, though.

For the sake of comparability with the current system, we decided to simulate not the actual French system for Germany, but to adapt some features of it to the existing German

system. In particular, we decided to keep the child benefit at the current amount and replace the child tax allowance by the family tax splitting. This means that the higher-yield test is between the current child benefit and the splitting gain from the child factors. Furthermore, we limit the splitting gains for the child factors not at the French level described above but at a somewhat higher level of 2,500 Euro, which is approximately the maximum tax relief implied by the child tax allowance in the current German system.

Full family splitting

Under full family splitting, income is divided by the total number of family members. This means that for each child, the splitting divisor is increased by 1. We simulate full family splitting under two alternative scenarios: first, without limiting the splitting gain (Reform 2) and, secondly, limiting the splitting gains for each child at 2,500 Euro (“full family splitting with ceilings”, Reform 3). In these two alternatives, we also keep the current child benefit at its current level and apply the higher-yield test between the child benefit and the splitting gain for the child factors.

3 Empirical Methodology

In order to assess the impact of the three reforms described in the previous section on the income distribution and the supply of labor, we use our behavioral micro-simulation model STSM which allows us to perform ex-ante evaluations of these effects.² STSM is based on the Socio-Economic Panel (SOEP) which is a representative sample of households living in Germany with detailed information on household incomes, working hours and household structure.³ This model basically consists of two parts: a tax-benefit calculator that computes net household incomes for each sample household on the basis of information on gross incomes, and for different (hypothetical) legislations and different working hours of individuals; and an empirical labor supply model with household utility depending on net household income and leisure of both spouses (in case of couple households). While the tax-benefit calculator allows us to compare net household incomes under the current legislation with those that would arise under different reform scenarios and, thus, to simulate their “first-

² For a detailed description of the Tax-Benefit Microsimulation Model STSM, see Steiner et al. (2005).

³ For more information on the SOEP, see <http://www.diw.de/soep>.

round” distributional effects, linking these effects to the behavioral part of the model also allows us to simulate their potential “second-round” labor supply effects.⁴

3.1 Calculation of Net Household Incomes

In the calculation of net household incomes we distinguish between two cases: (i) the simulation of “first-round” income effects which is based on the observed number of hours worked for each household; (ii) the simulation of “second-round” labor supply effects which, for each of the three reform proposals investigated here, is based on potential net household incomes in each of all the hypothetical hours categories the household could chose. While the computation of net household incomes in the first case is a relatively simple matter using STSM, the simulation of counterfactual incomes required in the second case is much more involved and proceeds as follows.

For the great majority of households the most important income component is earnings from dependent employment. For employed people, information on gross monthly earnings in the month before the interview is collected in the SOEP. This information together with the hours information contained in the SOEP is used to calculate gross hourly wages. Hypothetical monthly earnings for each possible hours category are computed by multiplying gross hourly earnings by the respective average number of working hours in each category. For couples, gross monthly earnings of the household are the sum of the two spouses (hypothetical) earnings in each hours category. For employed persons, it is assumed that the individual gross hourly wage in their actual hours category would be the same in each hours category. For persons not employed in the month preceding the interview, gross hourly wages are estimated on the basis of empirical wage equations. Due to item non-response wages are also missing for a non-negligible share of employed persons, for whom hourly wages are also imputed on the basis of these wage equations.⁵

Given (estimated) hourly wages, potential monthly earnings associated with each hours category are calculated for each individual in the sample by simply multiplying the hourly wage with the average number of hours worked per month in each category. As described in more detail in section 4.2 below, working hours are modeled as a discrete decision variable with a small number of categories, e.g. six hours categories for single women and fifteen

⁴ For a survey of behavioral micro-simulation models focusing on the simulation of “second-round” labor supply effects, see Creedy and Duncan (2002).

⁵ Estimation results of selectivity-corrected wage equations are reported in Steiner et al. (2005).

categories for couple households.⁶ For the latter, potential gross earnings of the two spouses in each of these categories are obtained by simply adding both spouses potential earnings for all categories with positive hours. These estimates of potential monthly earnings are the starting point for the calculation of net household income.

Employees' social security contributions and the income tax are deducted from gross household income and social transfers are added to it to get net household income. Social transfers include child allowances, child-rearing benefits, educational allowances for students and apprentices, unemployment compensation, the housing allowance, and social assistance. Taxable income is calculated by deducting certain expenses from gross household income. The income tax is calculated by applying the income tax formula prevailing in 2002 to taxable income.

Income from self-employment is not taken into account here, because the self-employed and their relatives are not included in the analysis. Information on income from capital and rents is directly taken from the respective questions in the GSOEP. It is well known that answers to the question on capital income in particular is very unreliable because of the perceived sensitivity of this question, and there is not much one can do about this on the basis of the GSOEP. This problem does not seem too severe in the present context because it would affect estimation results only to the extent that capital income varies with the choice of a particular hours category. However, it may affect the calculation of the hypothetical level of means-tested income support and thereby indirectly also the choice between employment and non-employment in some cases.

Importantly, we also account for the child care costs which affect net household income, depending on the number of hours worked by the secondary worker in the household. Following Wrohlich (2006), we argue that an adequate measure of child care costs not only consists of the average parents' fees to subsidized child care slots but has to be increased according to the probability of not getting such a slot due to rationing. Thus, the child care costs we are deducting from net household income are a weighted average of the parents' fees to subsidized child care facilities according to age of the child and the costs of private child care charged by babysitters or nannies. The weights correspond to the local availability of

⁶ We perform separate estimations for couples with both spouses assumed to be "flexible" regarding their labor supply (i.e. they are not students, pensioners or severely disabled), and for couples with only the husband (wife) assumed to be flexible. For these households we define 3 and 5 working hours categories, respectively; see Appendix C.

subsidized child care slots.⁷ We assume that part-time care is needed if the parent with the lower working hours is working less than 25 hours and that full-time care is needed if he or she is working more than 25 hours.

The SOEP data we use for the following empirical analysis are for the year 2003. Since the STSM is based on retrospective information on income components for the computation of net household incomes for a given year, incomes computed on basis of the SOEP wave 2003 refer to the year 2002. In order to take into account the new tax tariff of 2005 (see, e.g., Haan and Steiner, 2005) and other reforms that have taken place since 2002 (most importantly the reform of the unemployment assistance), we extrapolate incomes to the year 2005 on the basis of realized growth rates.⁸ Using STSM, we compute net household incomes under the current legislation as well as under the three reform scenarios. We restrict the analysis to couple households where at least one spouse has a “flexible” labor supply, and to single women.⁹

3.2 The Household Labor Supply Model

In order to investigate potential work incentive effects of the reform proposals analyzed here, we estimate a discrete-choice labor supply model on data for 2002. We then use the parameters obtained from these estimations in order to predict the change due to the new legislation and the extrapolated incomes in 2005 and the change due to the three reforms (in 2005). The difference between the change due to the reforms and the change due to the 2005 legislation gives us the effect of the family tax splitting reforms. Since we do not account for indirect effects related to the financing of the potential net fiscal costs of these reforms here, most families either have the same or a higher income than under the current legislation. It goes without saying that we do not expect changes in labor supply for households who do not face income changes. For those who have higher incomes after the reform because taxes are lower, the theoretically expected effect on labor supply is ambiguous since income and substitution effects act in opposite directions.

The labor supply estimation is based on a household utility model. In case of a couple, it is assumed that both spouses jointly maximize a utility function in the arguments leisure of

⁷ For a detailed motivation and description of this measure of child care costs, see Wrohlich (2006).

⁸ Over the whole period (2002-2005), wages were extrapolated with a factor of 3,1 % and income from rents with a factor of 2,1%.

⁹ Since we observe only a few single men living together with dependent children, we drop this group from our analysis.

both spouses and net household income. Working hours are modeled as a categorical variable.¹⁰ This takes into account the fact that, first, as described below working hours are heavily concentrated at particular hours for both men and women, which cannot be adequately approximated by specifying a continuous hours distribution. Second, the specification of a relatively small number of working hours categories leads to a tremendous reduction in the computational burden of calculating net household income at each possible hours choice. This simplification is in fact a prerequisite for an adequate specification of the budget constraint given the complexities of the German tax-benefit system.

Table 2: Distribution of households among hours categories for couple households

Couples, both spouses flexible hours					
	Weekly Hours*	<i>Men</i>			Sum
		0	1-40 (37)	> 40 (48)	
<i>Women</i>	0	151 (3.9)**	533 (13.7)	360 (9.3)	1044 (26.9)
	1-12 (8.5)	93 (2.4)	210 (5.4)	143 (3.7)	1485 (38.3)
	13-20 (18)		275 (7.1)	181 (4.7)	
	21-34 (27)		359 (9.2)	224 (5.8)	
	35-40 (38.5)	136 (3.5)	598 (15.4)	329 (8.5)	1359 (35)
	>40 (45)		149 (3.8)	147 (3.8)	
	Total	380 (9.8)	2124 (54.6)	1384 (35.8)	3888 (100)

* Average weekly working hours in parentheses

** Share (in percent) in parentheses

Source: Own calculations, SOEP, wave 20 (2003).

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. In particular, men typically do not work part-time and their actual working hours are heavily concentrated between 35 and 40 hours per week. For them, we therefore only differentiate between three hours categories, namely: non-employment (unemployment and non-participation in the labor force), 1 – 40 hours, and more than 40 hours (overtime). Furthermore, for couples the feasible number of categories is not only

¹⁰ The hours variable used here includes paid overtime, i.e. the number of actual hours worked in the reference month. This is the number of normal hours plus paid overtime hours. If a person working overtime hours did not answer the question whether overtime hours are compensated by cash or by shorter working time later on, it was assumed that half of the difference between actual hours worked and average normal hours will be paid (and the other half remunerated by holidays). This part was added to normal average hours.

restricted by the distribution of hours within one gender, but by the bivariate distribution of the two spouses' working hours. The actual distribution of couple households in the sample across hours categories is given in Table 2.¹¹

The econometric model is based on the assumption that each household compares the expected utility obtained from net income and the two spouses' leisure associated with the choice of a particular hours category.¹² The household's utility function is assumed to depend on the leisure time of the male (Lm) and the female (Lf) spouse as well as on real net household income (Y).¹³ Following van Soest (1995), we assume that the household's preferences can be described by the following translog utility index:

$$U_k(x_k) = x_k'Ax_k + \beta'x_k + \varepsilon_k$$

where $x = (y, lm, lf)'$. The components of x are the (natural) logs of net household income, taking into account child care costs as described above, and leisure of the husband and the wife, respectively. These components enter the utility function with linear, quadratic and cross terms between the spouses' leisure terms and household income to allow for full flexibility in substitution and income elasticities. The matrix A contains the coefficients referring to the non-linear terms, the vector β the corresponding coefficients of the linear terms. ε_k is a stochastic error term accounting for factors affecting the household's utility other than leisure and income. It is assumed to follow an extreme value distribution and to be independently distributed over households and choice categories. The decision rule for a household to choose alternative k equals

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

To estimate the parameters of the utility function, we use a discrete-choice model that is estimated separately for couples and single women. The parameters obtained from these

¹¹ The distributions of couple households with only one "flexible" spouse as well as singles are summarized in Appendix B.

¹² For the empirical estimation, the maximum time budget allocated to market work is assumed the same for each household member and is set to 80 hours per week. To test the sensitivity of estimation results with respect to this assumption, the model was also estimated with alternative values for the maximum time budget. Estimation results proved rather insensitive to realistic changes in the value chosen for this parameter. For example, changing the maximum number from 80 to 60 hours per week had very little effect on the estimation results

¹³ For a more detailed description and motivation of this model, see Steiner and Wrohlich (2004)

models can then be used for the prediction of behavioral changes. The estimation results, as well as the derived wage elasticities of labor supply, are summarized in Appendices C and D.

4 Empirical Results

4.1 “First-Round” Income Effects

In the following figure we present simulation results of “first-round” income effects for the three reform proposals measuring pure income changes after the reform has taken place, i.e. before individuals react to the new legislation. For a given household type, the figure shows how the income gains and losses resulting from the three reform proposals are spread over the income distribution.

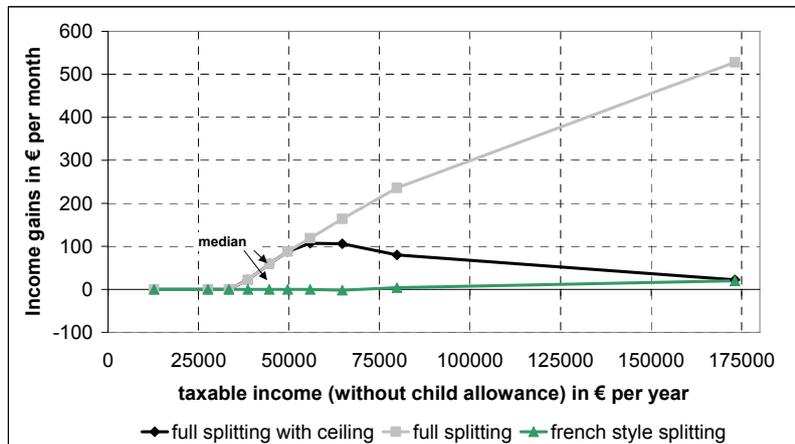
Figure 2a depicts income gains induced by the three reform proposals for the case of a married couple with one child. Under the French-style family splitting (Reform 1), net household incomes of families in the first seven deciles would not change at all.¹⁴ Families in the 8th decile would, on average, lose a small amount, whereas families in the 9th and 10th decile would gain 11 Euro per month on average. Under full family splitting (Reform 2) and full family splitting with ceiling (Reform 3), families in the lowest 3 deciles would not gain any additional tax relief. Families in deciles 4 and 5 would gain between 17 and 37 Euro per month under both reforms. Only in the upper part of the distribution would Reform 3 lead to lower tax relief than under Reform 2. In the former case, families in the 10th decile would gain about 300 Euro month on average.

The picture is very similar for married couples with two children (Figure 2b). Under the French splitting system we simulate for Germany, only the last decile would actually gain from the reform. Reforms 2 and 3 would imply income gains for families in deciles 4-10. In deciles 7-10, the ceiling would cut in under Reform 3 and lead to lower income gains than under Reform 2, where the latter would result in average income gains of 528 Euro per month for families in the 10th decile.

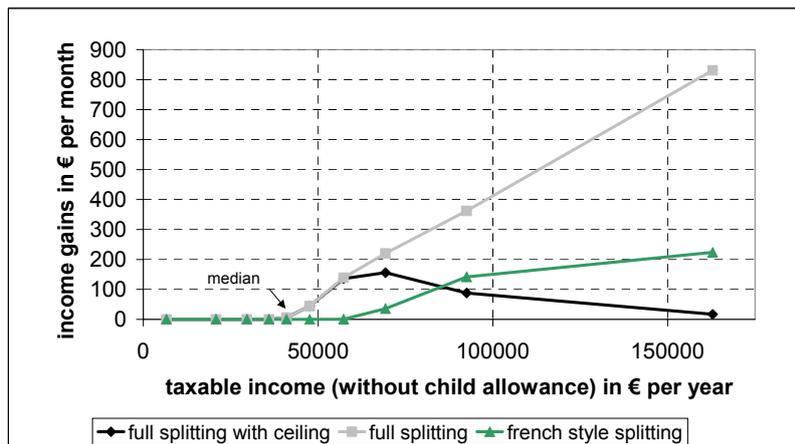
¹⁴ This result has also been found by Maiterth (2004), who simulated a family splitting with splitting factors of 0.5 for all children.

Figure 2: Income gains and losses by household type and number of children

a) married couples with 1 child



b) married couples with 2 children



c) married couples with 3 children

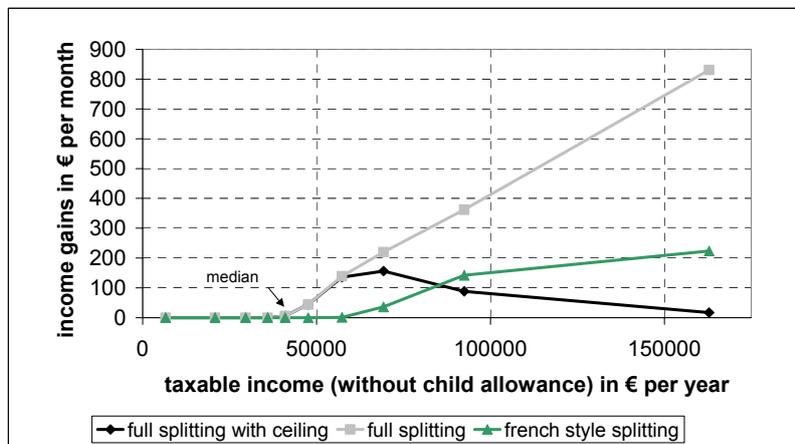
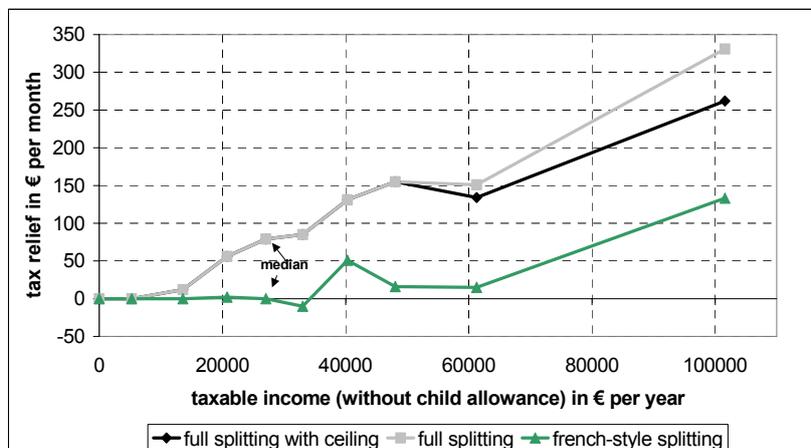
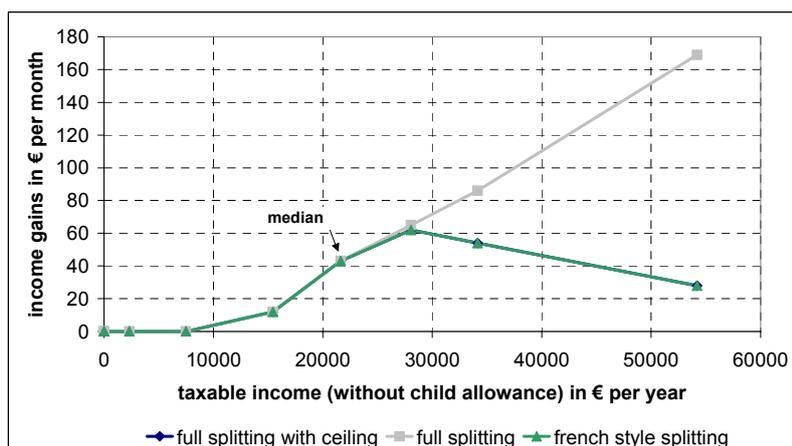


Figure 2 continued.

d) cohabiting couples with dependent children



e) single parents with 1 child



Source: Calculation based on SOEP, wave 20 (2003), and STSM.

For married couples with 3 children, however, the income gains resulting under the first reform, are markedly higher than for families with 1 or 2 children (Figure 2c). This is due to the fact that in the French system, the splitting factor as well as the ceiling of the splitting gain for the third child is double the amount of that for the first and the second child. Thus, families with 3 children in deciles 8, 9, and 10 receive an income gain of 36, 142 and 224 Euro on average, respectively. Note that the line depicting the structure of the tax relief under Reform 1 even intersects with the one under Reform 3, since here the maximum amount of the splitting gain was maintained for the child factor at 2,500 for the third child, while in Reform 1 it amounts to 5,000 Euro. Again, Reform 2 leads to the highest income gains

amounting to 831 Euro per month on average for families in the 10th decile. However, families in the first 5 deciles would not gain under this reform.

In contrast to married couples, non-married spouses living together are taxed individually but are entitled to child benefit and child allowance, respectively. Figure 2d shows the income gains for cohabiting couples with children under each of the reforms. Due to the limited number of observations for this group in the SOEP, we have to aggregate cohabiting couples with one or more dependent child(ren) here.¹⁵ As compared to the current legislation, where cohabiting couples are only entitled to the child allowance, the splitting gains from family splitting start at lower levels of the income distribution than in the case of married couples. However, for this group, too, only families with relatively high incomes would gain under Reform 1, whereas reforms 2 and 3 would result in relatively strong income gains especially in the upper part of the distribution; the highest income gain amounting to roughly 300 Euro per month, on average, would be realized by families in the highest decile.¹⁶

Figure 2e shows the case of a single parent with one child. For this family type, reforms 1 and 3 coincide, since under Reform 1, there is a splitting factor of 1.5 for the adult and 0.5 for the child. Under Reforms 2 and 3, the splitting factor equals 2 as well because the splitting factors are 1 for the single parent and 1 for the child. For all families of this household type in the highest 7 deciles, these reforms would lead to income gains compared to the status quo. Up to the 6th decile, the income gains resulting from all three reforms are the same. Only for the highest 3 deciles, the income gains are higher under Reform 2, leading to average income changes of 167 Euro per month in the highest decile.

Table 3 summarizes the aggregate distribution effects of the three different reforms by income decile, number of children and family type.¹⁷ In the upper part of the table income deciles are defined for the total population, whereas in the middle part they are defined for the subpopulation of families with children only. The total fiscal costs of each reform are shown in the last row of the table. By a large margin, Reform 1 yields the lowest fiscal costs result amounting to just 1.5 billion Euro, compared to 12.7 and 5.3 billion for Reform 2 and Reform 3, respectively.

¹⁵ In our simulation, we allocated a factor of 0.5 to each child under Reforms 2 and 3, and a factor of 0.25 to the first two children and 0.5 to the third and every subsequent child under Reform 1.

¹⁶ The spike at the 7th decile under Reform 1 is due to a composition effect related to the aggregation of households across number of children. In the 7th decile, the average number of children is higher (1.9) than in all other deciles (the average is 1.49).

¹⁷ The SOEP weighting factors for the year 2003 have been used to gross up simulation results.

Table 3: Aggregate distribution effects of the three reform alternatives, in billion Euro per year (in %)

	Reform 1 <i>French-style family splitting</i>	Reform 2 <i>Full family splitting</i>	Reform 3 <i>Full family splitting with ceilings</i>
By income decile – total population			
1 st Decile	0 (0)	0 (0)	0 (0)
2 nd Decile	0 (0)	0 (0)	0 (0)
3 rd Decile	0 (0)	0 (0)	0 (0)
4 th Decile	0 (0)	0 (0)	0 (0)
5 th Decile	0.06 (4)	0.12 (<1)	0.12 (2)
6 th Decile	0.18 (12)	0.33 (3)	0.32 (6)
7 th Decile	0.11 (7)	0.47 (4)	0.41 (8)
8 th Decile	0.12 (8)	1.29 (10)	1.16 (22)
9 th Decile	0.08 (5)	2.64 (21)	1.95 (37)
10 th Decile	0.94 (64)	7.86 (62)	1.37 (26)
By income decile – households with dependent children only			
1 st Decile	0 (0)	0 (0)	0 (0)
2 nd Decile	0 (0)	0 (0)	0 (0)
3 rd Decile	0.10 (7)	0.18 (1)	0.18 (3)
4 th Decile	0.16 (11)	0.31 (2)	0.30 (6)
5 th Decile	0.07 (5)	0.33 (3)	0.28 (5)
6 th Decile	0.12 (8)	0.74 (6)	0.63 (12)
7 th Decile	0.06 (4)	1.09 (9)	0.98 (18)
8 th Decile	0.02 (1)	1.56 (12)	1.17 (22)
9 th Decile	0.18 (12)	2.54 (20)	1.23 (23)
10 th Decile	0.76 (52)	5.95 (47)	0.54 (10)
By marital status (households with dependent children only)			
Married Couples	0.79 (53)	10.50 (82)	3.76 (71)
Cohabiting Couples	0.22 (15)	1.09 (9)	1.00 (19)
Single parents	0.47 (32)	1.15 (9)	0.57 (11)
By number of children in household			
1 child	0.51 (34)	4.49 (35)	2.04 (38)
2 children	0.15 (10)	5.61 (44)	2.37 (44)
3 children	0.57 (39)	2.13 (17)	0.67 (13)
4 or more children	0.25 (17)	0.48 (4)	0.25 (5)
Total costs	1.48	12.74	5.33

Source: Calculation based on SOEP, wave 20 (2003), and STSM.

The distribution of total costs across income deciles, defined for households with dependent children only, shows that under Reform 1 more than 50% of the total is distributed towards families in the highest income decile, whereas the 20% of families at the bottom of the

income distribution would gain not at all, and families in the middle of the distribution relatively little. An even higher share of income gains would accrue to the top decile (64%) if defined for the total population rather than families only; in this case, 40% of the population would not gain at all from this reform.

A similar picture also emerges under Reform 2, although at a much higher level: Almost 6 out of 12.7 billion Euro (47%) are distributed towards the highest income decile (if only households with dependent children are considered), whereas the 20% of families at the bottom of the income distribution would not gain at all by this reform. If all household are considered, the share of income gains accruing to the top decile rises to 62%, whereas the 40% of all household at the bottom of the income distribution would not gain at all from this reform.

Less drastic are the distributional effects under Reform 3. Due to the ceiling included in this reform proposal, roughly 10 percent of its total costs would be distributed to the highest income decile. However, this reform still leads to a considerable amount of redistribution in favor of the upper half of the income distribution. Families with incomes below median household income receive 14% of the total fiscal costs of the reform, whereas families above the median receive 86%.

The lion's share of total costs would accrue to couple households (married and unmarried spouses) under each of the three reform proposals. Roughly one third of costs would be distributed towards single parents under Reform 1, whereas this group would gain relatively little under both Reforms 2 and 3. The three reform alternatives also differ markedly in the way they distribute between families by the number of children: Under Reform 1 almost 50% of total costs are distributed toward families with 3 or more children, although the share of this group among all families with children only amount to less than 15 percent. In contrast to this strong redistributive effect in favor of large families, under Refroms 2 and 3 only a relatively small share of total costs would be distributed toward this group.

4.2 Labor Supply Effects

In Table 4 we report our simulation results of the labor supply effects of the three reform proposals for various types of households. Simulation results based on separate estimations

for couples and single females.¹⁸ In the upper part of the table the simulated change of participation rates (in percentage points) and the percentage change in the number of working hours are reported; the lower part of the table shows the grossed-up number of, respectively, additional persons supplying labor and working hours measured in full-time equivalents.¹⁹ These aggregate labor supply effects are derived by applying the SOEP weighting factors for the year 2003.

Due to the much larger income effects under Reform 2, the induced labor supply effects are strongest for this reform. Its introduction would raise the participation rate of married/cohabiting women by about 0.8 percentage points, while average working hours in this group would increase by 3 percent. For single mothers labor supply effects due to this reform would be relatively weak, amounting to 0.2 percentage points and 1.3 percent, respectively. In total, the grossed-up population numbers suggest that female labor supply would increase by 63,000 persons. In terms of working hours, the labor supply effect for this group amounts to 123,000 full-time equivalents.

For men living in couple households the simulated labor supply effects (point estimates, for confidence intervals see Table 4) induced by this reform are smaller than for women, amounting to, respectively, 28,000 persons and 56,000 full-time equivalents. These differences between men and women, and between single and married mothers are related to differences in empirical labor supply elasticities (see the Appendix D) as well as the distribution of income gains induced by the reform.

The introduction of a French-type family splitting (Reform 1) would have only very small labor supply effects on both married/cohabiting and single mothers, both with respect to labor force participation and hours worked (see Table 4). The grossed-up population numbers based on our point estimates suggest an increase in labor force participation of only about 7,000 persons and in total working hours by roughly 20,000 full-time equivalents. Potential labor supply effects of a full family splitting with ceilings (Reform 3) are also relatively small amounting to an increase in labor force participation of about 45,000 persons and total working hours of roughly 70,000 full-time equivalents.

¹⁸ We observe only very few single fathers with children, therefore we ignore this group in this analysis.

¹⁹ Full-time equivalents are calculated by dividing the total weekly hours by 38.5.

Table 4: Labor supply effects of family tax splitting reforms

	<i>Reform 1</i>	<i>Reform 2</i>	<i>Reform 3</i>
Women			
<i>Change in labor force participation rate (in percentage points)</i>			
All couples	0.04 (0.03 – 0.05)	0.49 (0.43 – 0.55)	0.19 (0.16 – 0.21)
Couples with dependent children	0.06 (0.05 – 0.07)	0.76 (0.67 – 0.84)	0.29 (0.26 – 0.33)
All singles	0.05 (0.03 – 0.06)	0.08 (0.06 – 0.11)	0.06 (0.04 – 0.08)
Singles with dependent children	0.12 (0.08 – 0.16)	0.20 (0.14 – 0.26)	0.15 (0.10 – 0.19)
<i>Change in average working hours (in percent)</i>			
All couples	0.17 (0.14 – 0.20)	1.93 (1.69 – 2.18)	0.63 (0.54 – 0.72)
Couples with dependent children	0.26 (0.21 – 0.31)	2.99 (2.62 – 3.67)	0.97 (0.84 – 1.11)
All singles	0.27 (0.19 – 0.35)	0.52 (0.37 – 0.67)	0.33 (0.23 – 0.43)
Singles with dependent children	0.66 (0.47 – 0.85)	1.28 (0.92 – 1.64)	0.81 (0.58 – 1.04)
<i>Additional labor supply in 1,000 persons</i>			
Singles and Couples	6 (5 – 8)	63 (55 – 72)	25 (21 – 29)
<i>Additional working hours in 1,000 full-time equivalents</i>			
Singles and Couples	16 (12 – 19)	123 (105 – 140)	40 (33 – 47)
Men			
<i>Change in labor force participation rate (in percentage points)</i>			
All couples	0.01 (0.00 – 0.02)	0.26 (0.23 – 0.29)	0.18 (0.16 – 0.20)
Couples with dependent children	0.02 (0.01 – 0.03)	0.40 (0.36 – 0.45)	0.28 (0.25 – 0.31)
<i>Change in average working hours (in percent)</i>			
All couples	0.04 (0.03 – 0.05)	0.53 (0.47 – 0.58)	0.29 (0.25 – 0.32)
Couples with dependent children	0.06 (0.05 – 0.08)	0.82 (0.74 – 0.89)	0.44 (0.39 – 0.50)
<i>Additional labor supply in 1,000 persons</i>			
All Men	1 (1 – 2)	28 (25 – 31)	20 (17 – 22)
<i>Additional working hours in 1,000 full-time equivalents</i>			
All Men	4 (3 – 5)	56 (50 – 60)	29 (25 – 32)

Notes: Grossed-up effects are rounded to the nearest thousands. Additional working hours include both those related to the participation effect and changes in working time of people already employed before the reform. Numbers in parentheses refer to 95%-confidence intervals that were derived using the bootstrap-method (100 repetitions).

Source: Estimations based on SOEP, wave 20 (2003) and STSM.

Our results regarding the small labor supply effects of the introduction of a French-type family splitting are in accordance with those of Beblo et al. (2004), who find that only mothers with three or more children would increase their labor supply; they also find that a small share of persons already employed before the reform may reduce their labor supply. In another study, Althammer (2000) investigates the labor supply effect of a similar reform which differs from Reform 1 analyzed here mainly in that he assumes that the child benefit is reduced to balance the budget. According to his estimates this reform would increase the labor force participation rate of women by 0.4 percentage points. Given that a balanced budget is assumed in this study, implying that there are losers and winners of the reform, these results are not directly comparable to ours, though.

Likewise, when comparing labor effects between the three reform alternatives analyzed here, one has to keep in mind that their fiscal costs differ widely (see Table 3). Even taking into account that the increased labor supply induced by the reforms will lead to higher income taxes and social security contributions („second-round“ effects), none of the three reform proposals is likely to be „self-financing“. This is particularly true for Reform 2 which, after taking into account these “second-round” effects, would still imply additional yearly fiscal costs in the amount of about 10 billion Euro.²⁰ Depending on the way these substantial fiscal deficits were to be financed – increasing the income tax or sales taxes, cutting social expenditures, or increasing the public debt – there would be further distribution and labor supply effects. Accounting for these effects, the positive labor supply effects found for the introduction of Reform 2, for example, are likely to be reduced and could even become negative.

5 Summary and Conclusion

As shown by our simulation results, the distribution and labor supply effects differ substantially between the three family splitting reform proposals investigated in this paper. Regarding its effects on net household incomes, for couples with one or two child(ren) the analyzed French-type family splitting system is virtually identical to the current German system of joint taxation of married couples and the existing child allowance. Only families with three or more children would, on average, benefit from this reform, although they would

²⁰ For Reforms 1 and 3 the „second-round“ fiscal effects would amount to about 170 and 800 million Euro, respectively, thus also leaving substantial fiscal deficits. These calculations do not account for potential “self-financing” effects through reduced unemployment compensation payments, though.

not gain if located at the bottom of the income distribution. Whereas the two full family splitting reforms would redistribute a larger share of the respective total fiscal costs towards families with one or two children than under the French-type family splitting system, families at the bottom of the income distribution would not gain from any of the reforms relative to the status quo.

Under all three reforms, the lion's share of the income gains would accrue to families with children in the upper part of the income distribution: in case of a transition to full family splitting almost half of all income gains for families, amounting to roughly 13 billion Euro per year, would be distributed towards the highest income decile. The transition to full family splitting would redistribute relatively less to families in the highest income group, and fiscal costs of the reform would amount to about 5 billion Euro per year, which still exceeds the expected costs of a French-type system of family splitting of about 1.5 billion Euro by a substantial margin.

We would not expect large labor supply effects, neither in absolute terms nor relative to their implied fiscal costs, from any of the three reform proposals analyzed here: Under full family splitting, our behavioral simulations imply an increase in labor force participation by about 75,000 persons and in total working hours by 200,000 full-time equivalents. Even accounting for these „second-round“ labor supply effects, the fiscal costs of a transition to full family splitting without ceilings would remain at about 10 billion Euro per year. Fiscal costs after accounting for „second-round“ effects would be much lower in case of full family splitting with ceilings and for a French-type system of family splitting, respectively, but so would be the labour supply effects.

The main reason for these relatively small labor supply effects is that, under all three analyzed reform alternatives, the current system of joint taxation of married couples, with its implied high marginal tax rates for secondary earners, remains in tact. The analyzed alternatives do, therefore, not fundamentally change the financial incentives to allocate spouses' labor within market work and home production relative to the current German system. Compared to the reform alternatives of family taxation analyzed here, much stronger labor supply effects could be expected from a transition to the individual taxation of incomes (see Steiner and Wrohlich 2004). A more substantial increase in labor supply than under any of the three family-splitting reform proposals analyzed here can also be expected from publicly subsidized child care or the preferential tax treatment of private child care expenditures (see Wrohlich 2006). These alternative policy instruments could also be

implemented in such a way to avoid redistribution towards high-income families and to limit fiscal costs.

6 References

- Apps, P. and R. Rees (2003): The Taxation of Couples, *Mimeo*, University of Sydney.
- Althammer, J. (2000): Ökonomische Theorie der Familienpolitik, Physica-Verlag, Heidelberg.
- Bach, Stefan, Hermann Buslei, Dagmar Svindland, Hans J. Baumgartner, Juliane Flach und Dieter Teichmann (2003): Untersuchung zu den Wirkungen der gegenwärtigen Ehegattenbesteuerung. *DIW Materialien* No. 27, Berlin.
- Baclet, Alexandre, Fabien Dell and Katharina Wrohlich (2005): Income Taxation and Household Size: Would French Family Splitting Make German Families Better off? *IZA Discussion Paper No. 1849*.
- Beblo, M., D. Beninger and F. Laisney (2004): Family Tax Splitting: A Microsimulation of its Potential Labour Supply and Intra-Household Welfare Effects in Germany, *Applied Economics Quarterly*, 50 (3), 233-240.
- Creedy, J. and A. S. Duncan (2002): "Welfare, Non-linear Budget Constraints and Behavioural Microsimulation", *Journal of Economic Surveys*, 16, 1-39.
- Haan, P. and V. Steiner (2005): "Distributional Effects of the German Tax Reform 2000 – A Behavioral Microsimulation Analysis", *Applied Social Science Journal*, 125, 39-49.
- Homburg, S. (2000): „Das einkommensteuerliche Ehegattensplitting“, *Steuern und Wirtschaft*, 30 (3), 261-268.
- Maiterth, R. (2004): „Verteilungswirkungen alternativer Konzepte zur Familienförderung. Eine empirische Analyse auf Grundlage der Einkommensteuerstatistik des Statistische Bundesamtes“, *Jahrbücher für Nationalökonomie und Statistik*, 224 (6), 696 – 730.
- Spahn, P. B., H. Kaiser and T. Kassella (1992): "The Tax Dilemma of Married Women in Germany", *Fiscal Studies*, 13 (2), 22-47.
- Steiner, V. and K. Wrohlich (2004): Household Taxation, Income Splitting and Labor Supply Incentives – A Microsimulation Study for Germany, *CESifo Economic Studies*, 50 (3), 541-568.
- Steiner, V., Haan, P. and K. Wrohlich (2005): Dokumentation des Steuer-Transfer-Mikrosimulationsmodells STSM. *DIW Data Documentation* Nr. 9, Berlin.
- van Soest, A. (1995): "Structural Models of Family Labor Supply: A Discrete Choice Approach", *Journal of Human Resources* 30 (1), 63-88.
- Wrede, M. (2003): "The Income Splitting Method: Is it Good for Both Marriage Partners?", *German Economic Review*, 4 (2), 203-216.
- Wrohlich, K. (2006): Labor Supply and Child Care Choices in a Rationed Child Care Market, *IZA Discussion Papers Nr. 2053*, Bonn.

6.1 Appendices

A. Alternative Forms of Family Taxation

1. Current system of income splitting for married couples and child tax allowance (with higher-yield test against child benefit)

$$T(Y_M, Y_F) = \min \left(\left(2 \cdot t \left[\frac{(Y_M + Y_F - KFB \cdot K)}{2} \right] \right), \left(2 \cdot t \left[\frac{(Y_M + Y_F)}{2} \right] - KG \cdot K \right) \right)$$

2. Family splitting without ceiling (with higher-yield test against child benefit)

$$T(Y_M, Y_F) = \min \left(\left((2 + \beta \cdot K) \cdot t \left[\frac{(Y_M + Y_F)}{(2 + \beta \cdot K)} \right] \right), \left(2 \cdot t \left[\frac{(Y_M + Y_F)}{2} \right] - KG \cdot K \right) \right)$$

3. Family splitting with ceiling (with higher-yield test against child benefit)

$$T(Y_M, Y_F) = \min \left(\left(\max \left((2 + \beta \cdot K) \cdot t \left[\frac{(Y_M + Y_F)}{(2 + \beta \cdot K)} \right] \right), \left(2 \cdot t \left[\frac{(Y_M + Y_F)}{2} \right] - D \cdot K \right) \right), \left(2 \cdot t \left[\frac{(Y_M + Y_F)}{2} \right] - KG \cdot K \right) \right)$$

with

$T(.)$	tax due
$t(.)$	tax tariff
K	number of children
KFB	child tax allowance
KG	child benefit
β	splitting factor for children
D	ceiling of splitting gain for children

B. Distribution of households among hours categories for couple households with only one flexible spouse and single women

Couples, only one spouse flexible hours			
Men		Women	
Weekly Hours of Man (Woman not flexible)		Weekly Hours of Woman (Man not flexible)	
0	76 (12.8)	0	434 (35.5)
		1-12 (8.5)	62 (5.1)
1-40 (36.5)	277 (46.6)	13-20 (18)	226 (18.5)
		21-34 (27)	110 (9.0)
> 40 (47)	241 (40.57)	35-40 (38.5)	319 (26.1)
		>40 (47)	73 (6.0)
Total	594	Total	1282
Singles			
Women			
Weekly Hours			
0	205 (19.7)		
1-12 (7.5)	42 (4.0)		
13-20 (18)	64 (6.2)		
21-34 (28)	149 (14.3)		
35-40 (38.5)	425 (40.9)		
>40 (46)	154 (14.8)		
Sum	1055		

Source: SOEP, wave 20 (2003).

C. Selected estimation results

The following table contains estimation results for couple household with two “flexible” partners. Estimation results for the other 3 subgroups are available from the authors upon request.

Variable	Coefficient	Standard Error
income	11.77**	3.06
income squared	0.19	0.17
income × husband’s leisure	-2.16**	0.25
income × wife’s leisure	-0.86	0.23
husband’s leisure	63.45**	5.03
husband’s leisure squared	-4.33**	0.27
wife’s leisure	28.98**	4.75
wife’s leisure squared	-1.01**	0.29
husband’s leisure × wife’s leisure	-2.28**	0.68
husband’s leisure × dummy1	-3.48	2.95
wife’s leisure × dummy1	-3.02	2.72
husband’s leisure × wife’s leisure × dummy1	0.87	0.71
income × dummy1	-3.24	2.34
income squared × dummy 1	0.27	0.17
husband’s leisure × dummy 2	-6.81**	2.13
wife’s leisure × dummy 2	-7.80**	1.99
husband’s leisure × wife’s leisure × dummy 2	1.52**	0.53
income × dummy 2	2.60**	1.12
income squared × dummy 2	-0.24**	0.10
husband’s leisure × husband’s age	-0.15**	0.06
husband’s leisure squared × husband’s age squared	0.22**	0.07
wife’s leisure × wife’s age	-0.33**	0.07
wife’s leisure squared × wife’s age squared	0.47**	0.08
husband’s leisure × husband’s health status	1.92**	0.43
wife’s leisure × wife’s health status	0.52	0.57
wife’s leisure × dummy 3	4.76**	0.33
wife’s leisure × dummy 4	2.36**	0.17
wife’s leisure × dummy 5	-0.17**	0.15

Number of observations: 58318 (3888 households, 15 choice categories)

Log Likelihood: - 9430.68

LR chi² (28): 2196.16

Notes: Dummy 1: Head of household (person answering the GSOEP household questionnaire) is German

Dummy 2: Household is living in east Germany

Dummy 3: Children under the age of 3 in household

Dummy 4: Children between 3 and 6 in household

Dummy 5: Children under the age of 17 in household

× indicates an interaction term

* indicates significance at 10 % level

** indicates significance at 5 % level

Source: Estimations based on SOEP, wave 20 (2003), and STSM.

D. Wage Elasticities of Labor Supply

	Women	Men
	<i>change in participation rates (in percentage points)</i>	
All couples	0.10 (0.09 – 0.11)	0.15 (0.13 – 0.16)
Couples with dependent children	0.10 (0.09 – 0.11)	0.14 (0.12 – 0.16)
All singles	0.07 (0.05 – 0.09)	
Singles with dependent children	0.07 (0.05 – 0.10)	
	<i>change in working hours (in percent)</i>	
All couples	0.31 (0.28 – 0.35)	0.23 (0.20 – 0.25)
Couples with dependent children	0.33 (0.29 – 0.36)	0.21 (0.19 – 0.24)
All singles	0.28 (0.20 – 0.36)	
Singles with dependent children	0.31 (0.22 – 0.40)	

Notes: Elasticities refer to a 1% increase in the gross wage. Numbers in parentheses refer to 95%-confidence intervals that were derived using the bootstrap-method (100 repetitions).

Source: Estimations based on SOEP, wave 20 (2003), and STSM.