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**Introducing Family Tax Splitting in Germany:
How Would It Affect the Income Distribution,
Work Incentives and Household Welfare?**

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Introducing Family Tax Splitting in Germany:

How Would It Affect the Income Distribution, Work Incentives and Household Welfare?

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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. If budgetary balance were financed by a lump-sum reduction of the child benefit, our results suggest that none of the reforms would be welfare-improving.

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 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 fact, it has been shown that 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 (Steiner and Wrohlich 2004; see Dearing et al. (2007) for a comparison between Germany and Austria, a country with individual income taxation.).

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 family splitting system 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.¹ The specific parameters of a potential family tax splitting reform in Germany have not yet been specified so far by proponents of this tax system. We thus decided to choose three reforms that seem most likely to be discussed in the near future. First, in all our reform proposals we keep the current system of joint taxation with income splitting for married couples even if they don't have children. At the current state of the discussion, the cut of the splitting advantage for married couples does not seem to be a realistic policy option.² Second, we keep the child benefit and abolish only the child tax allowance. In all three reform proposals, we substitute the child tax allowance by the tax relief resulting from the splitting factors for the children. Moreover, we keep the higher-yield test between child benefit and tax relief in place. Thus, the parameters left to be specified are the amount of the splitting factor and whether there is a limit to the tax relief granted for every child.

We simulate one reform that comes close to the French-style family splitting in that the splitting factor amounts to 0.5 for the first and second and 1 for the third and every subsequent child. Moreover, the splitting gain per child is limited to 2,500 Euro per year (5,000 from the third child onwards). Alternatively, we simulate two splitting reforms where the child splitting factor amounts to 1 for all children ("full family tax splitting"). In one alternative, we introduce a limit of the splitting gain of 2,500 Euro per child. In a more generous alternative we simulate this system without limiting the splitting gain for children.

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-

¹ Althammer (2000) simulates a family splitting reform that – besides introducing child splitting factors – cuts the sum of splitting factors for married spouses from 2 to 1.5. Beblo et al. (2005), on the other hand, simulate a family tax splitting following the French example that becomes effective, however, only for families who are better off under this reform scenario. For all other families, the current German system of child benefit and child tax allowance is kept unchanged. Bergs et al. (2006) simulate a French-type family splitting and model fiscal balance by changing the tax tariff for all households.

² This is in fact the only parameter that has been set by the conservative party CDU who is the only proponent of family tax splitting.

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. Under a French-type family splitting, more than two thirds 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 contrast to previous studies in this field, we compare the three reform scenarios not only with respect to their potential fiscal costs and labor supply effects, but also regarding their effects on household welfare as measured by compensating variation. To do this, we model fiscal neutrality by a lump-sum reduction of a child benefit. Under this assumption, our results show that on average none of the three reforms is welfare-improving. The most expensive reform scenario, full family tax splitting, would even result in a loss of household welfare amounting to 7 Euro per month on average.

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.³ At its maximum, the splitting advantage under the 2005 tax tariff amounts to roughly 8,000 Euro, which is reached at a yearly taxable income exceeding 100,000 Euro. 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). Single parents, who do not profit from income splitting, are granted a tax allowance (“Entlastungsbetrag”) amounting to 1,208 Euro per year. This allowance is only granted to single parents who can prove that they live without a spouse.⁴

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, or a child tax allowance of 5,848 Euro per year. Child benefit or tax allowance are granted according to the so-called higher-yield test (*‘Günstigerprüfung’*): the tax allowance is granted if the resulting amount of the tax relief exceeds the child benefit, and 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, would 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.

For a married couple with K number of children, the tax liability T can be formally stated as

$$T(Y_M, Y_F) = \min \left(\left(2 \cdot t \left[\frac{(Y_M + Y_F - KFB \cdot K)}{2} \right] \right), \left(2 \cdot t \left[\frac{(Y_M + Y_F)}{2} \right] - KG \cdot K \right) \right) \quad (1)$$

where Y_M and Y_F refer to the gross income of husband and wife, $t(.)$ refers to the tax tariff, KFB to the amount of the child tax allowance and KG to the amount of the child benefit per child.

³ 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 and Maiterth 2005).

⁴ Until 2002, unmarried parents were granted a so-called „household tax allowance“ („Haushaltsfreibetrag“) that amounted to 2,870 Euro per year. According to a decision of the constitutional court, stating that the household tax allowance implied a discrimination in favor of unmarried parents, this tax allowance was reduced to 1,188 Euro in 2004. In 2005, it was replaced by the single parent’s tax allowance described above.

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. Recently, in the fiscal and social policy debate various forms of family tax splitting have 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 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, labor supply and welfare 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.

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 the leading example, 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 Dell and Wrohlich 2006), however, they are granted in addition to the splitting gain.

For the sake of comparability with the current system, we adapt some features of the actual French system to the existing German one. In particular, we decided to keep the child benefit 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 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. Formally, this system can be described as:

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

where β refers to the splitting factor per child and D to the ceiling of the tax gain per child.

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 gain for each child at 2,500 Euro (“full family splitting with ceilings”, Reform 3). In these two alternatives, we also maintain the current child benefit and apply the higher-yield test between the child benefit and the splitting gain for the child factors. Full family splitting with ceilings thus differs from the French splitting system denoted in equation (2) only with respect to the amount of the splitting factor β . In the case of family splitting without ceilings, the calculation of the parents’ tax liability simplifies to:

$$T(Y_M, Y_F) = \min \left(\left((2 + \beta \cdot K) \cdot t \left[\frac{(Y_M + Y_F)}{(2 + \beta \cdot K)} \right] \right), \left(2 \cdot t \left[\frac{(Y_M + Y_F)}{2} \right] - KG \cdot K \right) \right) \quad (3)$$

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.⁵ 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.⁶ 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). 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-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.⁷ These behavioural changes in turn lead to changes in disposable income. In addition, they affect household welfare. Thus, we conclude the analysis with a break-up of changes in household welfare as measured by the compensating variation.

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

⁵ For a detailed description of the Tax-Benefit Microsimulation Model STSM, see Steiner et al. (2005).

⁶ For more information on the SOEP, see <http://www.diw.de/soep>.

⁷ For a survey of behavioral micro-simulation models focusing on the simulation of “second-round” labor supply effects, see Creedy and Duncan (2002).

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 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.⁸

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 categories for couple households.⁹ 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.¹⁰

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.

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.

⁸ Estimation results of selectivity-corrected wage equations are reported in Steiner et al. (2005).

⁹ 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.

¹⁰ 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.

Following Wrohlich (2007), 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 individual probability to be rationed with respect to subsidized childcare.¹¹ 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.¹² 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.¹³

3.2 The Household Labor Supply Model

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 both spouses and net household income. Working hours are modeled as a categorical variable.¹⁴ This takes into account the fact that first, 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

¹¹ For a detailed motivation and description of this measure of child care costs, see Wrohlich (2007).

¹² 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%.

¹³ Since we observe only a few single men living together with dependent children, we drop this group from our analysis.

¹⁴ 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.

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. The definition of the hours categories is motivated by both economic considerations and the actual distribution of hours in the sample. The actual distribution of couple households in the sample across hours categories is given in Table 2.¹⁵

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

Couples, both spouses flexible hours					
	Weekly Hours*	Men			Sum
		0	1-40 (37)	> 40 (48)	
Women	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 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.¹⁶ 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).¹⁷ Following van Soest (1995), we assume that the household's preferences can be described by the following utility index:

$$U_k(x_k) = x_k' Ax_k + \beta' x_k + \varepsilon_k \quad (4)$$

where $x = (Y, Lm, Lf)'$. 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

¹⁵ The distributions of couple households with only one "flexible" spouse as well as singles are summarized in Appendix B.

¹⁶ 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

¹⁷ For a more detailed description and motivation of this model, see Steiner and Wrohlich (2004)

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. Thus, the decision rule for a household to choose alternative k equals

$$P(U_k > U_l) = \frac{\exp(x'_k Ax_k + \beta'_i x_k)}{\sum_m \exp(x'_m Ax_m + \beta'_i x_m)}, \quad \forall l \neq k \quad (5)$$

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 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 B and C.

4 Empirical Results

4.1 “First-Round” Income Effects

In Figure 2 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 average income gains and losses resulting from the three reform proposals are spread over the income distribution.

Married couples with children in the first three income deciles do not gain under any reform scenario (Figures 2a-2c). Among the group of married couples with three children, this is even true for all households in the lower half of the income distribution. The French-style family splitting (Reform 1) is very similar to the current system and leads to substantial income gains only for married couples with three or more children in the three highest deciles. Full family splitting without ceilings (Reform 2) is the most generous reform and leads to very high income gains for families in the upper half of the income distribution. Married couples in the highest deciles gain about 300 Euro per month per child under this reform scenario. The income gains under a full family splitting with ceilings (Reform 3), however, are most generous to families in the 7th to 9th decile and lead to gains of about 50 Euro per child per month.

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.¹⁸ 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.¹⁹

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 about 170 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.²⁰ 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 sub-population of families with children. 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 amounting to just 1.5 billion Euro, compared to 12.7 and 5.3 billion for Reform 2 and Reform 3, respectively.

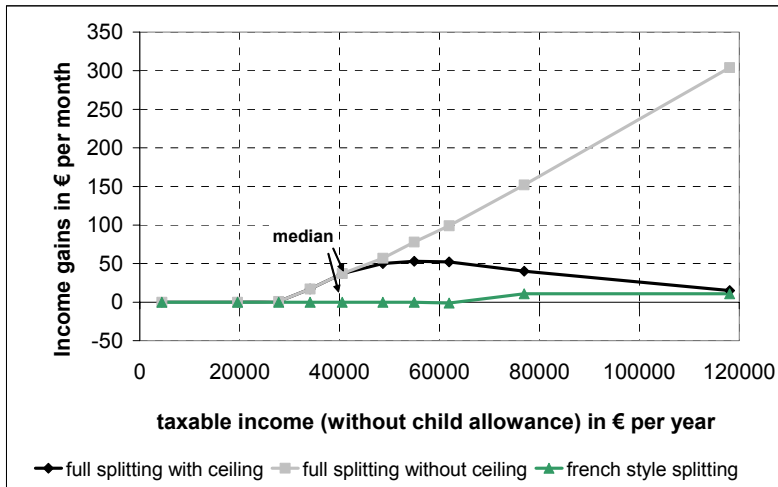
¹⁸ In our simulation, we allocated a factor of 0.5 to each child under Reforms 2 and 3, a factor of 0.25 to the first two children and 0.5 to the third and every subsequent child under Reform 1.

¹⁹ 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).

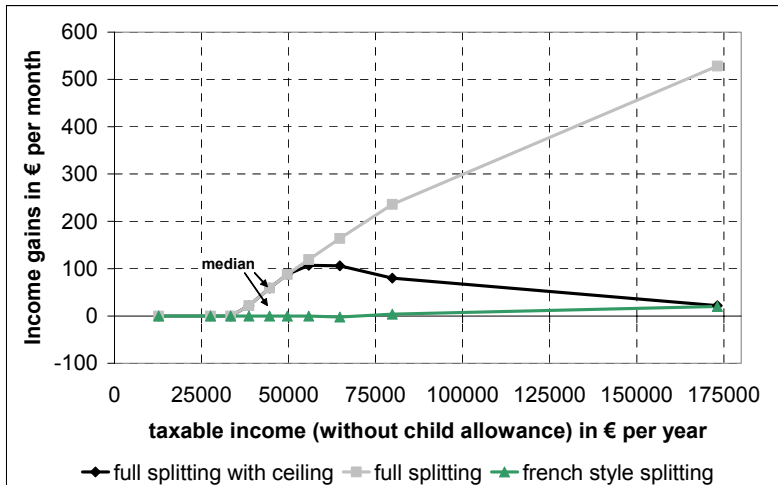
²⁰ The SOEP weighting factors for the year 2003 have been used to gross up simulation results.

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

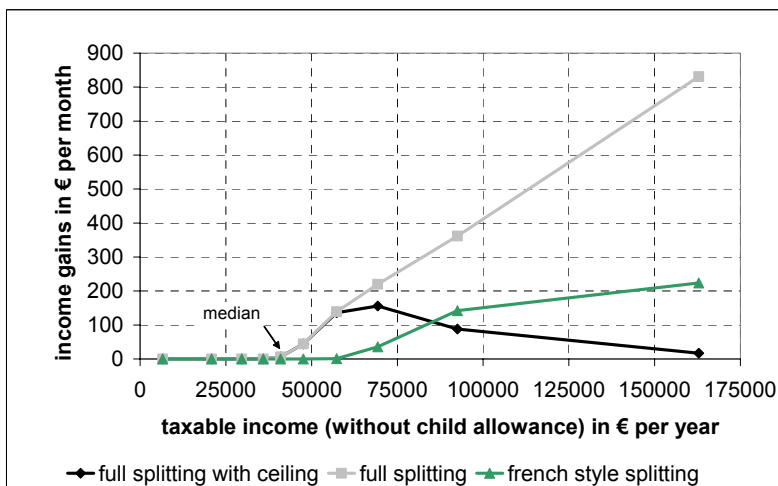
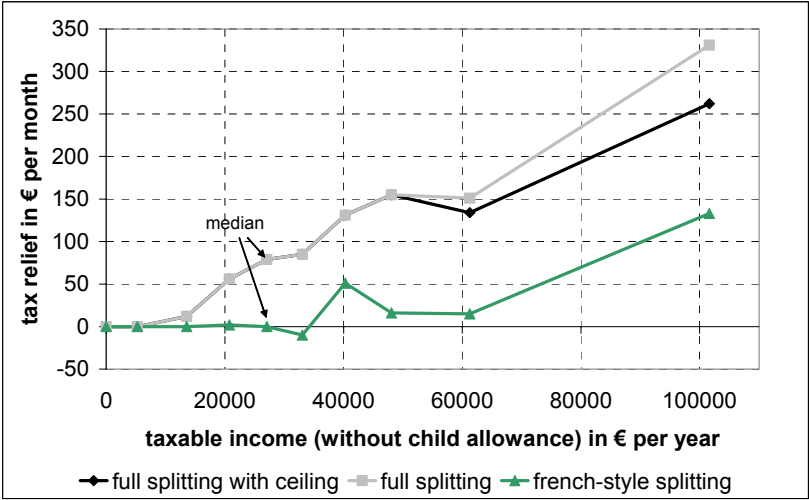
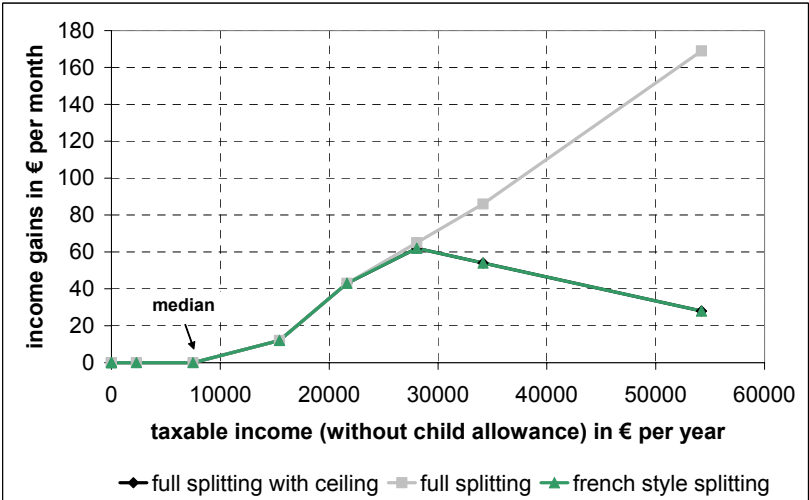


Figure 2 continued.

d) cohabiting couples with dependent children



e) single parents with 1 child



Note: Dots represent the average of taxable income and income gains within each decile.

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

The distribution of total costs across income deciles, defined for households with dependent children, 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 for families with children; in this case, 40% of the population would not gain at all from this reform.

A similar picture also emerges under Reform 2, although the amounts involved are much higher: 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 households 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 substantial 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 is 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.

Clearly, the reason why all three alternative versions of a family tax splitting lead to larger gains – in both absolute and relative terms – for high-income than for low-income families is that the child benefit and the higher-yield test against the tax gain is retained. Thus, families for whom the tax relief from the family tax splitting is lower than the child benefit do not gain under any of the three reforms.

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 (0)
2 nd Decile (1,200)	0 (0)	0 (0)	0 (0)
3 rd Decile (2,900)	0 (0)	0 (0)	0 (0)
4 th Decile (11,500)	0 (0)	0 (0)	0 (0)
5 th Decile (22,100)	0.06 (4)	0.12 (<1)	0.12 (2)
6 th Decile (30,500)	0.18 (12)	0.33 (3)	0.32 (6)
7 th Decile (38,800)	0.11 (7)	0.47 (4)	0.41 (8)
8 th Decile (50,300)	0.12 (8)	1.29 (10)	1.16 (22)
9 th Decile (67,400)	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			
1st Decile (0)*	0 (0)	0 (0)	0 (0)
2nd Decile (15,400)	0 (0)	0 (0)	0 (0)
3rd Decile (24,200)	0.10 (7)	0.18 (1)	0.18 (3)
4th Decile (31,200)	0.16 (11)	0.31 (2)	0.30 (6)
5th Decile (37,600)	0.07 (5)	0.33 (3)	0.28 (5)
6th Decile (45,400)	0.12 (8)	0.74 (6)	0.63 (12)
7th Decile (52,700)	0.06 (4)	1.09 (9)	0.98 (18)
8th Decile (62,300)	0.02 (1)	1.56 (12)	1.17 (22)
9th Decile (82,700)	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

Note: * refers to the upper bound of the respective decile.

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

4.2 Labor Supply Effects

In Table 4 we report labor supply effects of the three reform proposals for various types of households. Simulation results are based on separate estimations for couples and single females.²¹ 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”.²²

Induced labor supply effects are strongest under Reform 2: The participation rate of married/cohabiting women would increase 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 less than 0.2 percentage points and 0.7 percent, respectively. In total, the grossed-up population numbers suggest that female labor supply would increase by 69,000 persons. In terms of working hours, the labor supply effect for this group amounts to 125,000 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, 30,000 persons and 61,000 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 C) and in 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 8,000 persons and roughly 20,000 full-time equivalents, respectively. 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.

²¹ We observe only very few single fathers with children, therefore we ignore this group in the subsequent analysis.

²² Aggregate labor supply effects are calculated using the SOEP weighting factors for the year 2003. 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	0.05 (0.04 – 0.06)	0.54 (0.47 – 0.61)	0.19 (0.17 – 0.22)
Couples with dependent children	0.07 (0.06 – 0.09)	0.84 (0.74 – 0.94)	0.30 (0.26 – 0.34)
All singles	0.05 (0.03 – 0.06)	0.06 (0.03 – 0.10)	0.06 (0.03 – 0.08)
Singles with dependent children	0.11 (0.07 – 0.16)	0.15 (0.07 – 0.23)	0.14 (0.08 – 0.20)
<i>Change in average working hours (in percent)</i>			
All couples	0.21 (0.16 – 0.25)	2.18 (1.88 – 2.48)	0.63 (0.53 – 0.73)
Couples with dependent children	0.32 (0.25 – 0.39)	3.37 (2.91 – 3.83)	0.98 (0.82 – 1.13)
All singles	0.20 (0.12 – 0.28)	0.29 (0.12 – 0.47)	0.26 (0.15 – 0.36)
Singles with dependent children	0.49 (0.29 – 0.69)	0.71 (0.29 – 1.13)	0.63 (0.37 – 0.89)
<i>Additional labor supply in 1,000 persons</i>			
Singles and Couples	7 (5 – 9)	69 (62 – 76)	26 (22 – 30)
<i>Additional working hours in 1,000 full-time equivalents</i>			
Singles and Couples	14 (11 – 17)	125 (107 – 144)	39 (33 – 45)
Men			
<i>Change in labor force participation rate (in percentage points)</i>			
All couples	0.02 (0.01 – 0.02)	0.28 (0.25 – 0.31)	0.19 (0.17 – 0.21)
Couples with dependent children	0.03 (0.02 – 0.04)	0.43 (0.38 – 0.48)	0.29 (0.26 – 0.33)
<i>Change in average working hours (in percent)</i>			
All couples	0.05 (0.04 – 0.06)	0.57 (0.52 – 0.63)	0.29 (0.26 – 0.33)
Couples with dependent children	0.07 (0.06 – 0.09)	0.89 (0.81 – 0.97)	0.46 (0.40 – 0.51)
<i>Additional labor supply in 1,000 persons</i>			
All Men	1 (1 – 2)	30 (26 – 34)	20 (17 – 23)
<i>Additional working hours in 1,000 full-time equivalents</i>			
All Men	4 (3 – 5)	61 (55 – 67)	29 (25 – 33)

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.

4.3 Effects on Household Welfare

When comparing the income and labor supply 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.²³

Thus, differences in fiscal costs have to be taken into account, e.g. by requiring budgetary balance. To make the reform proposals comparable, one possibility is to assume that the costs are financed by reducing the child benefit. The monthly child benefit would have to be reduced by 6.6 Euro per child under Reform 1, by 57.1 Euro under Reform 2 and 23.9 Euro per child under Reform 3. Taking the reduction of the child benefit into account would only slightly change labor supply reactions. Since revenue-neutrality is modeled by lump-sum deductions of the child benefit, and the income effect of labor supply reactions is very small, these new labor supply reactions are not significantly different from the ones presented in Table 4.²⁴

Table 5 shows the distribution of net household income after the introduction of revenue-neutral reforms and their resulting labor supply reactions by income decile. Under the assumption that budgetary balance is achieved by adjusting the child benefit, all three reforms lead to losses in net household income for families in the lower deciles of the income distribution. The French-style family splitting (Reform 1) increases net income only for families in the uppermost 4 deciles. This is also true for a full family tax splitting without ceilings (reform 2). Full family splitting with ceilings results in a more equal distribution of income gains than Reforms 1 and 2. On average, all three reforms result in income gains, ranging from 3 Euro per month in the case of the French-style family splitting to 36 Euro per month under full family tax splitting. Full family tax splitting with ceilings increases monthly net household income by 14 Euro on average.

²³ 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. However, these calculations do not account for potential “self-financing” effects through reduced unemployment compensation payments.

²⁴ Detailed results are available from the authors upon request.

Table 5: Income changes and welfare changes under the three reform scenarios if the reform is financed by reducing the child benefit (in Euro per month; only households with children)

	Reform 1		Reform 2		Reform 3	
	<i>French-style family splitting</i>		<i>Full family splitting</i>		<i>Full family splitting with ceilings</i>	
Deciles of expected income*	Income Change	Welfare Change	Income Change	Welfare Change	Income Change	Welfare Change
1 st Decile	-1	-1	-51	-59	-10	-17
2 nd Decile	-10	-10	-63	-76	-12	-22
3 rd Decile	-10	-9	-50	-72	+1	-16
4 th Decile	-10	-8	-25	-51	+16	-3
5 th Decile	-7	-9	+9	-30	+34	+13
6 th Decile	-6	-6	+14	-19	+33	+16
7 th Decile	-5	-7	+33	0	+29	+18
8 th Decile	+11	+4	+46	+10	+28	+15
9 th Decile	+16	+8	+98	+47	+25	+14
10 th Decile	+41	+27	+286	+179	+6	+4
By marital status						
Married Couples	0	-5	+44	+4	+10	0
Cohabiting Couples	+14	+8	+47	+19	+86	+61
Single parents	+10	+11	-6	-40	+8	-10
By number of children						
1 child	+5	+3	+45	+18	+21	+12
2 children	-7	-9	+42	0	+16	+3
3 or more children	+23	+10	-27	-84	-12	-32
Average over all households with children	+3	-1	+36	-4	+14	+2

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

The distribution of income changes by marital status shows that – relative to the average income gain – singles gain most under the French-style family tax splitting. This is due to the additional splitting factor of 0.5 that is granted for the single parent, which leads to higher tax reliefs than the current single parent’s tax allowance. Married couples profit most – in absolute and in relative terms – under the full family tax splitting without ceilings, because this group is most likely to be found in the uppermost deciles of the income distribution. Cohabiting couples, who are more likely to be found in the middle of the income distribution, gain most under full family tax splitting with ceilings.

The average income effects of these revenue-neutral reforms are positive because both parents increase their labor supply. This, however, implies that they have less time for leisure. A comprehensive assessment of the changes in households’ well-being has to take potential losses in utility due to increased labor supply into account. This can be done by using a

money-metric measure of utility changes, such as the Compensating Variation (CV).²⁵ The change in household welfare measured by the CV is shown in Table 5. Comparing welfare changes to income changes reveals the utility loss of reduced leisure time. The welfare gain is lower than the income gain for all groups. On average, Reforms 1 and 2 even lead to small losses in household welfare, amounting to 1 and 4 Euro per month, respectively. On average, Reform 3 would increase household welfare by 2 Euro per month.

If policy conclusions are to be drawn from the comparison of aggregate welfare changes, one has to keep in mind that the aggregation presented in Table 5 puts an equal weight on all households, ignoring differences in household composition and income and is thus implicitly assuming a Utilitarian social welfare function. Yet, it seems much more plausible to us to assume that households with less income are getting higher weights than households with higher income in the social welfare function. In the following, we will therefore show average welfare changes under alternative weighting schemes and assume that the weight w of household i is a function of equivalized income y_i

$$w_i = \frac{1}{y_i^\nu}$$

where ν is a parameter that expresses the “redistributive taste” of a society. The higher ν , the higher is the weight put on low-income households and the implied degree of inequality aversion; for $\nu = 0$, the Utilitarian social welfare function is obtained.

Table 6 shows the average change in household welfare measured by the compensating variation for values of $\nu = 0.5$, $\nu = 1$ and $\nu = 2$. Under all three weighting schemes, the average losses (or gain under Reform 3) in household welfare are higher (smaller) than under the assumption of a Utilitarian social welfare function, and the losses are increasing with values of ν . The effects under Reform 1 are not as sensitive to variations of ν as the other two reforms because single parents are treated more favourably than under the other two reforms, and single parents are more likely to be located in the lower deciles of the income distribution. In absolute values, though, except for Reform 2, welfare effects are rather small even under the assumption of a relatively high degree of inequality aversion ($\nu = 2$). In this case, Reform 2 would result in an average loss of welfare by about 50 Euro per month as measured by the CV.

²⁵ See, e.g., King (1983) or Creedy and Duncan (2002). The Compensating Variation measures the amount of money a household has to be granted in order to compensate the loss in utility after the reform. If the difference between post-reform and pre-reform utility is positive, the compensating variation measures the amount of money that would have to be withdrawn from the household such that it obtains the pre-reform level of utility.

Table 6: Average change in household welfare under different weighting schemes, measured by compensating variation (in Euro per month)

	Reform 1 <i>French-style family splitting</i>	Reform 2 <i>Full family splitting</i>	Reform 3 <i>Full family splitting with ceilings</i>
v = 0.5	-4	-15	+1
v = 1	-5	-30	-3
v = 2	-8	-53	-10

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

5 Summary and Conclusion

The three family splitting reform proposals investigated in this paper can be shown to cause very different distributional and labor supply effects. Under the French-type family splitting system, net household incomes of couples with one or two child(ren) is virtually identical to the income resulting under 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 even they would 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 also not gain from these reforms.

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. This 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 ceiling and for a French-type system of family splitting, respectively, but so would be the labour supply effects.

If budgetary balance is to be achieved e.g. by a uniform reduction of the child benefit, only one of them – full income splitting with ceilings - would increase average household's welfare as measured by the Compensating Variation. Although average incomes would increase under all reforms, the loss in parents' leisure time outweighs the utility gain from increased income, and the net effect on utility is zero or negative. Average income losses are higher the more weight is put on low-income households. Thus, assuming a medium taste for redistribution within a society, none of the three reforms would be welfare-improving. This result, of course, is driven by the assumption on how these reforms are to be financed. A lump-sum reduction of the child benefit affects all households, in particular low income households who would not gain from the family tax splitting reforms. Moreover, if all households, not only those with dependent children, would have to pay for the financing of these reforms, the results would change as well.

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, S., H. Buslei, D. Svindland, H. Baumgartner, J. Flach und D. Teichmann (2003): Untersuchung zu den Wirkungen der gegenwärtigen Ehegattenbesteuerung. *DIW Materialien* No. 27, Berlin.
- Baclet, A., F. Dell and K. 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.
- Bergs, Christian, Clemens Fuest, Andreas Peichl and Thilo Schaefer (2006): Das Familienrealsplitting als Reformoption in der Familienbesteuerung. *Wirtschaftsdienst* 86/10, 639-644.
- Dearing, H., H. Hofer, C. Lietz, R. Winter-Ebmer and K. Wrohlich (2007): Why are mothers working longer hours in Austria than in Germany? A comparative micro-simulation analysis. *DIW Discussion Paper No. 596*.
- Dell, F. and K. Wrohlich (2006): Family Tax Splitting, *CESifo DICE Report – Journal for Institutional Comparisons*, 4 (4), 50-54.
- Creedy, J. and A. S. Duncan (2002): “Welfare, Non-linear Budget Constraints and Behavioural Microsimulation”, *Journal of Economic Surveys*, 16, 1-39.
- King, Melvyn (1983): “Welfare effects of tax reforms using household data”, *Journal of Public Economics*, 21, 183-214.
- 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.
- Maiterth, R. (2005): Familienpolitik und deutsches Einkommensteuerrecht – Empirische Ergebnisse und familienpolitische Schlussfolgerungen. *arqus Diskussionsbeiträge zur quantitativen Steuerlehre* Nr. 7.
- 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 Welfare effects of tax reforms using household data: 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. (2007): Evaluating Family Policy Reforms Using Behavioral Microsimulation. The Example of Childcare and Income Tax Reforms in Germany, *Doctoral Dissertation, Free University of Berlin, published on-line under <http://www.diss.fu-berlin.de/2007/531>*.

5.1 Appendices

A. 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).

B. Selected estimation results

The following table contains estimation results of the utility function 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	0.1801**	0.0440
income squared	-0.0006	0.0005
income × husband’s leisure	-0.0006**	0.0002
income × wife’s leisure	0.0001	0.0001
husband’s leisure	0.3684**	0.0349
husband’s leisure squared	-0.0021**	0.0001
wife’s leisure	0.1445**	0.0307
wife’s leisure squared	-0.0001	0.0000
husband’s leisure × wife’s leisure	-0.0004*	0.0002
husband’s leisure × dummy1	-0.0144	0.0164
wife’s leisure × dummy1	-0.0100	0.0124
husband’s leisure × wife’s leisure × dummy1	0.0002	0.0002
income × dummy1	0.0342	0.0393
income squared × dummy 1	-0.0001	0.0005
husband’s leisure × dummy 2	-0.0315**	0.0121
wife’s leisure × dummy 2	-0.0497**	0.0096
husband’s leisure × wife’s leisure × dummy 2	0.0004**	0.0002
income × dummy 2	-0.0765**	0.0276
income squared × dummy 2	0.0010**	0.0003
husband’s leisure × husband’s age	-0.0035**	0.0012
husband’s leisure squared × husband’s age squared	0.0049**	0.0012
wife’s leisure × wife’s age	-0.0063**	0.0012
wife’s leisure squared × wife’s age squared	0.0088**	0.0013
husband’s leisure × husband’s health status	0.0336**	0.0077
wife’s leisure × wife’s health status	0.0130	0.0099
wife’s leisure × dummy 3	0.0743**	0.0052
wife’s leisure × dummy 4	0.0376**	0.0030
wife’s leisure × dummy 5	-0.0042	0.0026

Number of observations: 58320 (3888 households, 15 choice categories)
Log Likelihood: -9383.37
LR chi² (28): 2291.05

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.

C. Wage Elasticities of Labor Supply

	Women	Men
	<i>change in participation rates (in percentage points) in case of a 1 % increase of gross hourly wage</i>	
All couples	0.11 (0.10 – 0.12)	0.15 (0.13 – 0.17)
Couples with dependent children	0.12 (0.10 – 0.13)	0.14 (0.13 – 0.16)
All singles	0.06 (0.04 – 0.08)	
Singles with dependent children	0.07 (0.04 – 0.10)	
	<i>change in working hours (in percent) in case of a 1 % increase of gross hourly wage</i>	
All couples	0.35 (0.32 – 0.39)	0.23 (0.20 – 0.26)
Couples with dependent children	0.38 (0.34 – 0.42)	0.22 (0.20 – 0.25)
All singles	0.18 (0.10 – 0.26)	
Singles with dependent children	0.21 (0.12 – 0.31)	

Notes: 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.