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An unconditional basic income in the family context: Labor supply and distributional effects

ZEW Discussion Papers, No. 10-091

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Suggested Citation: Horstschräer, Julia; Clauss, Markus; Schnabel, Reinhold (2010) : An unconditional basic income in the family context: Labor supply and distributional effects, ZEW Discussion Papers, No. 10-091, Zentrum für Europäische Wirtschaftsforschung (ZEW), Mannheim

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An Unconditional Basic Income in the Family Context – Labor Supply and Distributional Effects

Julia Horstschräer, Markus Clauss,
and Reinhold Schnabel

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Non-technical summary

Basic income schemes are discussed among all political parties in Germany. A basic income is a specific form of a guaranteed minimum income for every citizen. Distributed unconditionally it could simplify the current German welfare state by replacing the numerous means-tested welfare transfers. The proposed basic income schemes combine several different instruments like a negative income tax, a flat tax system and lump sum payments for health insurance. The concepts discussed differ in crucial design parameters mainly in the level of guaranteed income.

We focus our analysis on the prominent proposal by the conservative party (Christian Democratic Union – CDU). By introducing their proposal of an unconditional basic income, all means-tested social transfers would be replaced by a negative income tax scheme that guarantees every citizen a minimum income, regardless of whether he or she is in work or unemployed. Social security payments would be substituted by a payroll tax for employers and a tax-financed basic pension would replace the current pension scheme. The transfer withdrawal rate would be considerably reduced to 50% and a flat tax rate of 25% is suggested.

Our paper analyzes the effects of the proposed basic income reform and two budget-neutral alternatives on labor supply and income distribution. A special focus lies on the work incentives for secondary earners in the family context. We use a detailed microsimulation model for the German tax system to simulate the reform and a structural household labor supply model for the estimations. The analyses are based on the micro data of the German Socio-Economic Panel (GSOEP).

Our results show that the originally proposed basic income concept yields a very high deficit. Therefore, we also study two budget neutral alternatives. Introducing the originally proposed reform, our model predicts a large increase of labor supply due to high working incentives caused by the low tax rate. But raising the tax rate in order to meet the criteria of budget neutrality, labor supply adjustments turn negative. By comparing labor supply and distributional effects of the budget neutral alternatives, we observe that positive labor supply reactions coincide with increasing inequality, which indicates the general equity-efficiency trade-off. Furthermore, the unconditional character of the basic income causes especially for families a strong increase in incomes, which affects labor supply of couple households negative. At the same time the basic income concept itself generates serious disincentives for secondary earners.

Das Wichtigste in Kürze

Zur Reformierung des Sozialstaates werden in Deutschland verschiedene Grundeinkommenskonzepte diskutiert. Ein besonders prominentes Konzept ist das von Dieter Althaus vorgeschlagene Solidarische Bürgergeld. Ziel eines solchen Grundeinkommens soll u.a. die Entkopplung der sozialen Absicherung von der Erwerbsarbeit sein. Dadurch soll der Arbeitslosigkeit sowie nicht existenzsichernden Einkommen entgegengewirkt werden, ohne die Finanzierbarkeit des Sozialstaates zu gefährden.

Das bedingungslose Grundeinkommen sieht vor, mit Hilfe einer negativen Einkommenssteuer jedem Bürger ein Mindesteinkommen in Höhe von 600 Euro zu sichern. Alle bisherigen Sozialtransfers zur Grundsicherung würden durch das Grundeinkommen ersetzt werden. Der Reformvorschlag enthält außerdem eine Bürgerpauschale für die Krankenversicherung sowie die Umstellung der Gesetzlichen Rentenversicherung auf eine steuerfinanzierte Bürgergeldrente. Die Finanzierung des Grundeinkommens soll über eine zweistufige "flat tax"mit einer Transferentzugsrate von 50 Prozent und einem einheitlichen Steuersatz von 25 Prozent erfolgen.

Unser Beitrag analysiert die Effekte des Althaus-Vorschlags sowie zweier budget-neutraler Alternativen auf das Arbeitsangebot und die Einkommensverteilung. Dabei liegt ein besonderes Augenmerk auf den Arbeitsanreizen für Zweitverdiener im Familienkontext. Wir verwenden ein detailiertes Mikrosimulationsmodell zur Simulation der Reform und ein strukturelles Modell zur Schätzung des Arbeitsangebots. Die Analysen basieren auf den Daten des Sozio-oekonomischen Panels.

Unsere Simulationsergebnisse zeigen, dass die Einführung des Solidarischen Bürgergeldes zu einem Defizit im Staatshaushalt gegenüber dem Status quo in Höhe von ca. 250 Milliarden Euro führen würde. Wir betrachten daher zusätzlich zwei budgetneutrale Alternativen: Eine Variante mit höherem Steuersatz und eine Variante mit höherer Transferentzugsrate. Die Ergebnisse unserer Analysen zeigen, dass aufgrund der niedrigen Steuersätze des Althaus-Vorschlags das Arbeitsangebot steigen würde, während die beiden budgetneutralen Alternativen ein sinkendes Arbeitsangebot zur Folge hätten. Der Vergleich der Arbeitsangebots- und Verteilungseffekte zeigt, dass bei positiver Entwicklung des Arbeitsangebots negative Auswirkungen auf die Einkommensverteilung zu erwarten sind und umgekehrt. Dies zeigt den generellen Zielkonflikt zwischen Effizienz und Gleichheit. Desweitern führt der Verzicht auf eine Bedarfsprüfung insbesondere für Familien zu stark ansteigenden Einkommen und somit zu einem hohen Einkommenseffekt, der sich negativ auf das Arbeitsangebot von Paarhaushalten auswirkt. Gleichzeitig erzeugt das Grundeinkommenskonzept an sich noch zusätzlich negative Arbeitsanreize für Zweitverdiener.

An Unconditional Basic Income in the Family Context - Labor Supply and Distributional Effects

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Abstract

In this paper we estimate the effects of an unconditional basic income on labor supply and income distribution with a special focus on the incentives to work in the family context. An unconditional basic income guarantees every citizen a minimum income without any means-testing. We simulate a proposed basic income reform with a detailed microsimulation model, estimate labor supply reactions with a structural labor supply model and perform distributional analysis using micro data from the German Socio-Economic Panel. As the originally proposed basic income concept yields a very high deficit, we also analyze two budget neutral alternatives. Comparing labor supply and distributional results of the budget neutral alternatives, the well-known equity-efficiency trade-off is unveiled. In the family context our analyzes suggest that the unconditional character of the basic income causes increasing family incomes, but also serious disincentives to work for secondary earners.

Keywords: Basic income, negative income tax, flat tax, female labor supply

JEL-classification: C15, D31, D78, H31, H53, J08, J22

Acknowledgements: This paper in part presents results of a study financed by the German Council of Economic Experts and published in German Council of Economic Experts (2007). The authors are solely responsible for the content of this paper, which must not necessarily constitute the opinion of the German Council of Economic Experts or the ZEW. The paper has benefited from discussions at the Vereinstagung 2008 and the 2nd General Conference of the International Microsimulation Association in 2009. We thank Melanie Arntz, Holger Bonin, Giulia Colombo, Nicole Gürtzgen, Stefanie Schubert and Holger Stichnoth for valuable comments. All remaining errors are ours.

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1 Introduction

The idea of a basic income was very popular in Germany during the 1980s Opielka & Vobruba (1986), Schmid (1984).[1] Recently the idea has reappeared in public discussions. Basic Income schemes are a specific form of a guaranteed minimum income, distributed either unconditionally or means-tested to every citizen via a lump sum payment or a negative income tax. Since unemployment rates, in particular for low-skilled workers, are very high in Germany and income distribution has widened (OECD 2007, 2008), proponents of a basic income hope to tackle these developments by granting unconditional transfers. An additional aim of basic income concepts is the simplification of Germany's tax and transfer system, which has been an important issue on the political agenda for some years now.

Different schemes are discussed in Germany among all political parties. The concepts differ in crucial design parameters, most notably in the level of guaranteed income. We focus on the quite modest proposal by the conservative party (CDU – Christian Democratic Union), which is based on a relatively moderate basic income (Althaus 2007). The introduction of such an unconditional transfer would replace all social transfers by a negative income tax scheme that guarantees every citizen a minimum income regardless of the employment status. The reform proposal combines several instruments such as a change to individual taxation, a negative income tax, a flat tax system and lump sum payments for health insurance.

Recent studies analyze the effects of this basic income reform proposal in the German context with respect to the public budget and labor supply. Opielka & Strengmann-Kuhn (2007) and Straubhaar & Hohenleitner (2007) focus on the question whether a basic income reform is financially feasible and how the tax parameters need to be chosen for a budget neutral reform. Straubhaar & Hohenleitner (2007) also consider effects on the labor market. Their stylized model suggests positive labor supply reactions. The Structural labor supply estimations by Bonin & Schneider (2007) also predict positive labor supply reactions with an increase of about 600,000 full-time equivalents (FTE). [2]. Fuest & Peichl (2009) find only slightly positive labor supply effects. All studies clearly show that a basic income concept with the originally proposed tax parameters would yield a high financial deficit.

The international literature on basic income and the related field of a negative income tax also addresses the consequences of a basic income for families. A study on a basic income

[1] The Concept of a "Basic Income" emerged with the ideas on a negative income tax of Rhys-Williams (1953) and Friedman (1962). So far, only Brasil and Alaska have introduced a Basic Income. In January 2008 Namibia introduced a project called "Basic Income Grant" with a testing phase of 2 years.

[2] One FTE is equivalent to a full-time worker, while an FTE of 0.5 represents a person working only half-time. We define a full-time position to be 38 hours per week

for Ireland for example shows (i) that high tax rates are necessary to refinance the basic income payments, (ii) that especially women benefit from individualized payments and in consequence (iii) that married women refrain from the labor market, as they react more sensitive to income changes (Callan et al. 2000). Similar in a study on a negative income tax as a special form of a basic income, Paulus (1991) describes that a basic income would lead to a decreasing labor force participation of women and therefore consolidates existing role patterns in the Netherlands. Although negative income tax schemes and universal basic income schemes are similar and can yield the same income distribution, they are different redistributive programs. Negative income tax systems follow the libertarian idea, while a basic income is in line with an egalitarian concept (Tonadi 2009).

Our paper analyzes the effects of the proposed conservative basic income reform and two budget-neutral alternatives – one with an adjusted tax rate and one with an adjusted withdrawal rate – on labor supply and income distribution. We calculate, to our knowledge, for the first time labor supply effects of two budget neutral alternatives and add distributional analysis to the literature on basic income. Furthermore, our paper extends the literature by a special focus on the family context investigating the (dis-)incentives for secondary earners induced by the basic income and a high income effect.

We use a detailed microsimulation model for the German tax system and a structural household labor supply model. The estimations are based on micro data from the German Socio-Economic Panel (GSOEP). Overall, we confirm the very positive labor supply reactions of the earlier literature on the originally proposed reform, but labor supply reactions turn negative for the budget neutral alternatives. A high tax rate yields negative labor supply reactions, while the income inequality of the status quo seems to be mitigated in this case. In contrast, a high withdrawal rate affects labor supply not as negative, but seems to widen the income distribution. This illustrates the general equity-efficiency trade-off. Our results also suggest that the family context is very important for a basic income reform. Especially women living in couple households reduce their labor supply, because of a high basic income for children and the estimated high leisure preference for women. Moreover, the original reform concept and the alternative with a high withdrawal rate create disincentives to work for secondary earners due to a simultaneous introduction of individual taxation and a negative income tax.

In the next section we discuss the basic income concept and its theoretical implications for labor supply (Section 2). Section 3 subsequently provides a description of the data and the structural household labor supply model. Simulation results are given in Section 4 for the originally proposed basic income and in Section 5 for the two budget neutral alternatives. Section 6 concludes.

2 Basic Income Reform

The basic income reform proposal discussed within the German conservative party aims at a comprehensive reform of welfare and tax policy. It combines several separately discussed instruments such as a change to individual taxation, a negative income tax, a flat tax system, lump sum payments for health insurance and a tax financed pension. The next subsection explains the current welfare and tax system and the basic income concept in more detail. Subsequently, we discuss the implications of the reform proposal with regard to labor supply on a theoretical basis.

2.1 Status Quo and Basic Income Concept

In 2005 a large welfare reform was introduced in Germany that combined payments of social and unemployment assistance. Nevertheless, the German welfare state is currently still based on many different social transfers granted on the basis of means-testing. Income is taxed in a progressive system (i.e. average tax rates increase monotonically with increasing taxable income) with tax rates ranging from 0% to 42%. A lack of transparency due to many different tax deduction possibilities is often criticized. Further, Couples can choose to be assessed jointly, which implies that the couples income is split in half to determine the tax rate which is then applied on the couples total income. The progression of the tax system then leads to a splitting advantage. As single earner households benefit the most from the income splitting, the current tax system with joint assessment creates disincentives for secondary earners (Steiner & Wrohlich 2004).

In contrast to the status quo, the tax system of the proposed basic income is designed as a two-stage flat tax system as shown in Equation 1. Individual i with a gross income Y_i below the threshold of $\frac{1}{t_1}BI$ is taxed with the rate of t_1 and receives a basic income BI. Additionally, everyone needs to pay a health lump sum tax H in the basic income system, while the current health care system is based on a public health insurance financed equally by employers and employees. In 2005 employer and employee needed to pay 15.5% of the employees gross labor income. [3] Tax payments T_i result in the basic income concept. They can be negative due to the basic income payments. Individuals above the income threshold are taxed with the rate t_2, their basic income amounts to $\frac{t_2}{t_1}BI$ and they pay the same amount H for health care. Tax payments for individuals earning above the threshold are always positive, but the basic income reduces their tax burden just like a tax credit.

[3] Self-employed, civil servants and persons with an income above a certain threshold can opt out of the public system and use a private health insurance.

$$T_i = \begin{cases} t_1 Y_i - BI + H & \text{if } 0 < Y_i < \frac{1}{t_1} BI \\ t_2 Y_i - \frac{t_2}{t_1} BI + H & \text{if } Y_i \geq \frac{1}{t_1} BI \end{cases} \tag{1}$$

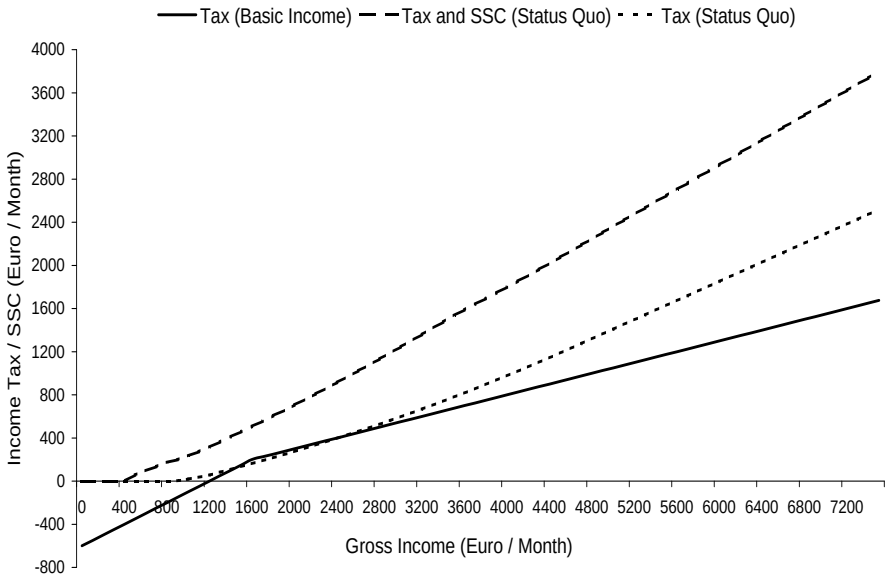
The design of the basic income concept thus depends on the tax parameters, the level of the basic income and the health lump sum tax. The original proposal suggests a basic income (BI) of 800 Euro for persons earning below the threshold and a health lump sum tax (H) of 200 Euro. Thus, an income of 600 Euro is guaranteed for every adult citizen without any earned income ($Y_i = 0$). This amount is proposed as it is similar to the subsistence level in Germany.[4] The tax rate (t_1) can be considered as a withdrawal rate and is set to 50%. Hence, an individual earning less than the threshold needs to pass half of it's labor income to the state. For persons with a higher income the reform concept suggests a tax (t_2) of 25%. Consequently, the basic income, or more precisely the tax credit, amounts to 400 Euro for them. With this parameters the threshold for the lower tax rate amounts to a gross income of 1,600 Euro. In addition to this tax system, the concept also suggests a basic income of 500 Euro for every child. As children also need to pay 200 Euro for health insurance, parents receive a net transfer of 300 Euro per child. This is twice as much as the child benefit of 2005.

Figure 1 illustrates the described basic income tax system (solid line) in comparison to the status quo tax scheme (dashed lines). It depicts for different gross incomes of a single household without children the corresponding income tax and social security contributions (SSC). In the basic income system individuals with an income below the threshold of 1,600 Euro are taxed with a higher rate (50%) than individuals with a higher income (25%). This is reflected by the different slopes of the solid line. A negative income tax results up to 1,200 Euro, while individuals with an income between 1,200 Euro and 1,600 Euro already pay positive taxes due to the health payments. A comparison between the basic income tax scale and the status quo shows that the post reform tax payments are lower for almost all gross incomes. Especially, persons with a high income benefit from a reduction of the tax burden.

Besides the changes in the tax system, another important aspect is the abolition of all social benefits, which are only paid on the basis of means-testing in the status quo. Social benefits includes for example unemployment assistance (short term), unemployment benefits (long-term) and benefits for housing, children and education. The basic income in form of a negative income tax, which is granted without means-testing, should substitute all these welfare payments. Additionally, all tax deductions are abolished and the current

[4]The subsistence level for 2008 has been calculated by the German government (Deutscher Bundestag 2006) and amounts to 595 Euro per month for a single person.

Figure 1: Tax-Transfer Scheme for Singles Without Children



Data Source: Own calculations.

pay-as-you-go pension scheme is replaced by a tax-financed basic income pension, granted on top of the regular basic income for retirees aged 67 and above. The amount of the basic pension depends on the previous income and the duration of employment, and is limited to a maximum amount of 600 Euro. The pensions are financed by a 12% payroll tax for the employers, who in return do not need to pay social security contributions any longer.[5]These modifications point out the appealing simplicity of a basic income concept, that could indeed reduce the complexity of the current tax system.

2.2 Basic Income and Labor Supply Theory

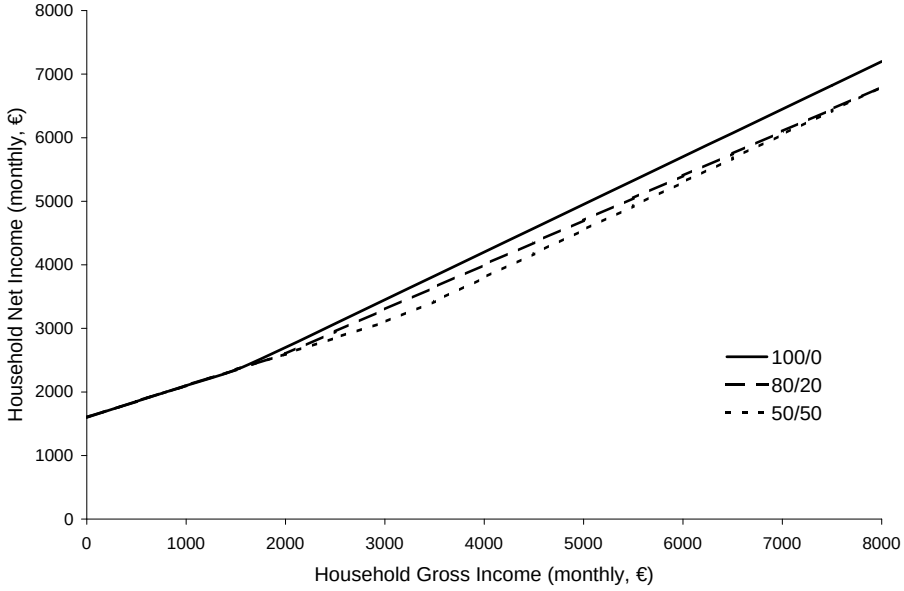
The introduction of the proposes basic income reform would change Germany's joint taxation system to one with individual taxation. Such a shift is important for labor supply decisions of couple households, because their net income decreases due to the abolished splitting advantage. At the same time disincentives for secondary earner created by joint assessment do not affect their labor supply any longer. Simulating the introduction of separate taxation Steiner & Wrohlich (2004) show that the average net income would decline substantially in West Germany and only moderate in East Germany. Labor supply of women in couple households would increase and a significant number of husbands would exit the labor market.

[5]Regarding the current pension scheme there needs to be a transition period, as old claims must be fulfilled. The extra financing necessary for the transition period cannot be considered in our analysis. Here we only provide a long-run analysis of the basic income reform, in the sense that claims of the current pension system do not exist any longer.

But a basic income system would not only induce a change from joint to individual taxation, but would also introduce a negative income tax. The literature on the Earned Income Tax Credit (EITC) (Eissa & Hoynes 2004, Hotz & Scholz 2006, Scholz 1996) and the Working Families' Tax Credit (WFTC) (Blundell 2000, Blundell & Walker 2002) can give first insights on labor supply reactions due to a negative income tax. The EITC is a negative income tax in the USA that is based on the family income and is only granted as an in-work benefit. Hotz & Scholz (2006) present a study on the EITC showing that it affects labor supply (extensive margin) in general positive. Due to the in-work character of the negative income tax, the positive effects on the extensive margin are in line with labor supply theory. But for an unconditional basic income, i.e. a negative income tax independent of the employment status, we cannot expect these positive incentives on a theoretical basis. Furthermore, the literature shows that working hours (intensive margin) seem to decrease slightly with the introduction of the EITC for people already being employed as well as for secondary earners. Secondary earners face direct disincentives to participate on the labor market due to the EITC being based on the family income, as the income of a secondary earner often leads to a cessation of EITC payments (Eissa & Hoynes 2004). This kind of disincentives should not be relevant for the basic income, as payments are based on the individual and not on the family income.

Figure 2, however, illustrates that the distribution of earned income between the spouses affects the household net income also in the basic income concept. The solid line indicates gross and the according net income for single earner households (100/0), the dashed line for households in which one spouse earns 80% of the gross income (80/20) and the dotted line for households sharing work equally (50/50). For gross incomes below the threshold of 1,600 Euro per month net incomes do not depend on the households' decision, since each partner – regardless of the work constellation – is subject to a withdrawal rate of 50% and receives a basic income of 800 Euro. Above the threshold net incomes are optimized in case of a single earner household. For these households the labor income is taxed with the low rate of 25%, the working spouse receives a tax credit of 400 Euro and the non-working spouse additionally receives the full basic income of 800 Euro. Every Euro a secondary earner would earn is taxed with the higher withdrawal rate of 50%, as long as the second income is below the threshold. Hence, a household benefits more from a single earner increasing his labor supply than from a secondary earner entering the labor market with a low income. A disincentive to share work equally exists even if both partners earn above the threshold and therefore are taxed with the lower rate. In this case the income of both partners is taxed with 25%, but they also only receive a tax credit of 400 Euro. Instead, a single earner household with the same gross income would receive the 800 Euro basic income for the non-working spouse. The disincentive for a secondary earner, thus, exactly equals the difference between the full basic income (800 Euro) and the lower tax credit (400 Euro).

Figure 2: The Intra-household Working Decision: Original Basic Income



Data Source: Own calculations.

Besides these labor supply disincentives in the family context, a basic income can also induce an income effect with negative labor supply reactions for all household types. This is the case, if the negative income tax exceeds the current social transfers or if net income rises due to lower tax rates. Moreover, the high basic income for children must be considered as an additional positive income effect for households with children. But a reform that lowers tax rates also causes a substitution effect increasing labor supply due to rising hourly net earnings. Whether the income or substitution effect is more important for a basic income reform depends on the assigned tax parameters and therefore can only be answered on an empirical basis.

3 Data and Structural Labor Supply Model

We use micro-data of the German Socio-Economic Panel (GSOEP), which is a yearly panel of about 12,000 representative households including approximately 23,000 people above the age of 16 years. The data includes many socio-demographic variables, such as information on actual employment status, working hours and gross income.[6] In our analysis we use data of the year 2004. As most of the people are surveyed in the first half of a year, we complement the data with retrospective information from 2005 to obtain more precise information about the households.

For the calculation of taxes, social security contributions, benefits and the according net incomes, we use a very detailed microsimulation model (Clauss & Schubert 2009) for

[6]See also Wagner et al. (2007).

the German tax and transfer system. As the simulations are based on the gross hourly wage rates, which we derive from the observed gross income, we have to impute wages for unemployed individuals. Hence, we estimate a Mincer-type wage equation and correct for sample selection as proposed by Heckman (1976). In a base simulation, we calculate the net incomes according to the legislation in 2004. As in 2005 a comprehensive welfare reform was introduced, we then simulate the net incomes for the legislation in 2005 and refer to the results after this simulation as the status quo. In order to simulate the effects of a basic income in comparison to the status quo, we also simulate the basic income scenario. The simulated net incomes of the status quo and the basic income scenario are the basis of our labor supply estimation and are therefore transferred to a structural household labor supply model.

In our labor supply model, according to van Soest (1995), individuals choose the working hour category (H^j where $j = 1, \ldots, J$) with the highest attributed utility among a finite discrete set of hour categories. The choice set of working hours for men and women includes {0, 15, 30, 38, 47} hours, with zero hours for non-participation, 15 to 30 hours for part-time employment, 38 hours for full-time employment and 47 hours for overtime. Married or cohabiting couples choose between the different hour combinations and jointly maximize their utility. We specify utility as a linear translog function of income and leisure:

$$U(x) = x'Ax + \beta'x + \epsilon \tag{2}$$

The vector x contains the logarithmic variables of net incomes as well as leisure time for the different hour categories. The behavioral parameters are represented by the vector β and the symmetric matrix A. The parameters are also influenced by further covariates (e.g. age, education, number of children, regional dummy for Eastern Germany, nationality) included in x to control for heterogeneity in leisure preferences. The unobserved part is defined by ϵ which is assumed to be independently and identically distributed (iid) and to follow a Gumbel or type I extreme value distribution.

According to McFadden (Mc Fadden 1974) the probability of choosing category k instead of category l out of m possible hour categories can be estimated using the following logit function:

$$Pr_k(U_k > U_l) = Pr(X = k) = \frac{\exp(x_k'Ax_k + \beta'x_k)}{\sum_m \exp(x_m'Ax_m + \beta'x_m)}, \forall l \neq k \tag{3}$$

The parameters of this conditional logit model are estimated using the maximum like-

lihood approach. For the estimation of the model we need to assume the independence of irrelevant alternatives (IIA-assumption). That means that the calculated probabilities for choosing category k instead of category l are independent of the other alternatives. If the alternatives differ substantially from one another, it is likely that the IIA-assumption holds. But it can be problematic to assume the independence of other alternatives, if some categories are similar and, therefore, can be considered close substitutes.

Our distributional analysis compares simulated net incomes of the status quo legislation in 2005 with simulated net incomes after a basic income reform. We take labor supply reactions into account by recalculating net incomes after the labor supply estimations. Using equivalence weighted incomes, we perform a percentile analysis to identify the winners and losers of the reform along the income distribution. In addition, the Gini coefficient and the Atkinson measures (Atkinson 1970) indicate changes with respect to income inequality. For the calculation of inequality measures after labor supply responses we use the pseudo distribution method described in Creedy et al. (2004).[7]

4 Results for the Original Basic Income

One major constraint for the introduction of a basic income is the public budget. Therefore, we compare calculated revenues and expenditures of the status quo with calculated revenues and expenditures of the reform scenario before labor supply adjustments in Table 1. In the status quo expenditures – mainly social benefits – exceed revenues, thus yielding a deficit of 13 billion Euro. Revenues in the basic income system include income tax (116.6 billion Euro) and pay roll taxes of employers (102.0 billion Euro), while basic income and basic rent payments add up to calculated expenditures of 477.7 billion Euro. This results in a negative balance of 259.1 billion Euro in case of a basic income. Hence, the basic income cannot be implemented in a budget-neutral fashion. Instead the balance of revenues and expenditures in the basic income setting exceeds the deficit of the status quo by 246.1 billion Euro. The additional deficit is mainly driven by low withdrawal and tax rates and generous basic income transfers.

[7]Since the discretisation of the hours leads to a loss in accuracy, the pseudo distribution method uses the estimated probabilities of each hour category which are multiplied with the household weighting factor, to approximate the real income distribution. Creedy et al. (2004) showed that this method produces accurate values of the income inequality measures in a probabilistic choice framework and is superior to other methods (i.e. expected income method).

Table 1: Effects on the Public Budget

	Billion Euro / Year
Revenues Status Quo	163.9
Expenditures Status Quo	176.9
Balance Status Quo	-13.0
Revenues Basic Income	
Income tax	116.6
pay roll tax employers	102.0
Expenditures Basic Income	
Basic Income	273.1
Basic Income (children)	86.1
Basic Pension	98.4
Basic Pension (widows)	20.1
Balance Basic Income	-259.1
Balance Basic Income vs. Status Quo	-246.1

Data Source: SOEP 2004, own calculations.

On the positive side, the low withdrawal and tax rates yield high work incentives at the extensive and intensive margin. We observe an increase in labor supply by about 1.19 million full-time equivalents (FTE). Table 2 shows that participation overall increases by 562,078 persons (2.42%). Men (+470,986 persons) react more sensitive to lower taxes then women (+91,092 persons). Female and male single households as well as men living in couple households participate more often after the reform, but participation of women living in couple households decreases. 141,748 (1.23%) women living in a couple household stop working due to the disincentives for secondary earners (see Section 2.2)and their high leisure preferences (see Appendix A.3). The disincentives for secondary earners created by the basic income tax scheme seem to be even larger than the disadvantages of the current joint taxation system. Thus, for secondary earners in couple households the income effect caused by the simultaneous introduction of a negative income tax and individual taxation dominates the substitution effect due to lower tax rates. With regard to the intensive margin (working hours) we actually observe positive effects for all subgroups. In total, working hours increase by 602,316 full-time equivalents. Working hours of men increases by 2.20% (271,011 FTE), while women's working time even rises by 3.72% (331,305 FTE). Thus, for many women in couple households the income effect outweighs the substitution effect and they refrain from the labor market, but for some the substitution effect is more important and they extend their working hours.

Table 2: Labor Supply Effects - Original Basic Income

	Participation		Working Hours		Total	
	Persons	%	FTE	%	FTE	%
Total	562,078	2.42	602,316	2.84	1,190,189	5.61
Men	470,986	3.92	271,011	2.20	750,325	6.08
Women	91,092	0.81	331,305	3.72	439,865	4.94
Singles						
Men	170,471	5.19	89,374	3.76	260,310	10.96
Women	232,821	6.78	138,868	5.28	340,512	12.94
Couples						
Men	300,470	3.13	181,637	2.01	490,014	5.42
Women	-141,748	-1.23	192,436	3.30	99,353	1.71

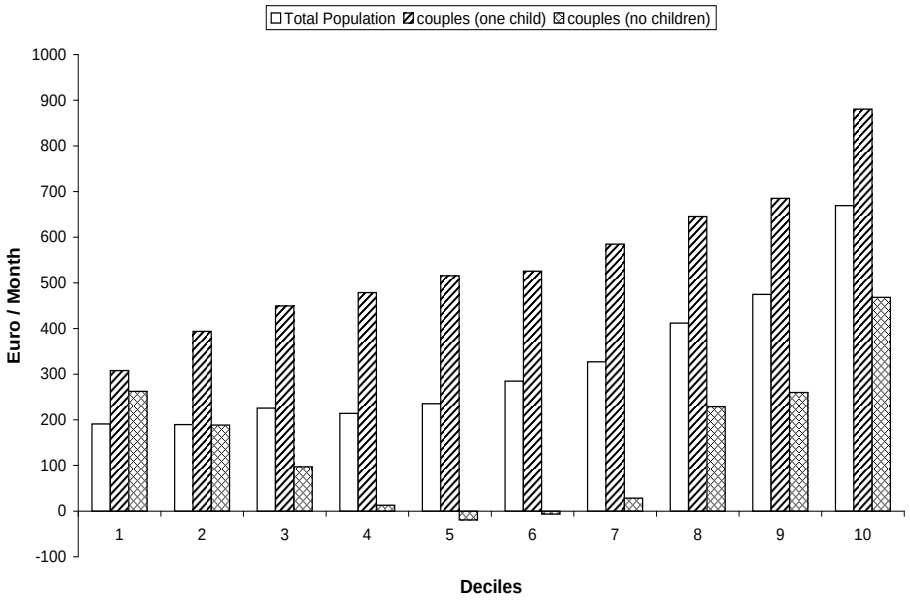
Data Source: SOEP 2004, own calculations.

Furthermore, we compute monthly gains and losses per capita by deciles of disposable income in the status quo in order to identify which households benefit from the introduction of a basic income across the income distribution. Results of the percentile analysis after labor supply adjustments are depicted in Figure 3. All deciles benefit from the introduction with a very high increase of households´ monthly net income. The net income for households in the lower deciles rises because they are eligible to a negative income tax (basic income) and because of a lower withdrawal rate. Gains for persons in the upper part of the income distribution are even higher. Reducing the tax rate to 25% for all incomes over 1,600 Euro yields monthly gains of over 600 Euro per capita for the total population. Couples with no children in general gain less than average and we even observe losses for them in the middle of the income distribution. Losses for couple households are possible due to the change from joint taxation to individual taxation, as they suffer from the abolishment of the splitting advantage. In contrast, couples with one child gain more than average in all deciles. Generous basic income payments for children increase their net incomes additionally. Overall, the large increases in net incomes across the whole income distribution are not very surprising given that a basic income with such generous tax and transfer parameters yields a deficit of about 246 billion Euro.

Inequality measures summarize the information of the percentile analysis and indicate that the income distribution has widened. The Gini coefficient would rise from 0.26 to 0.28. This result is also supported by the Atkinson measure $A(\epsilon)$, which can indicate changes in different segments of the income distribution. The index becomes more sensitive to changes at the lower end of the income distribution as ϵ approaches 1. We calculate the Atkinson measures A(0.5) and A(1). Both measures increase – A(0.5) from 0.05 to 0.06 and A(1) from 0.10 to 0.12 – indicating that especially the upper deciles gain with respect to their net income.

Our results are in line with the earlier literature on the budgetary and labor supply effects of a basic income in Germany. The proposed basic income would yield a large budgetary

Figure 3: Percentile Analysis: Original Basic Income



Data Source: SOEP 2004, own calculations.

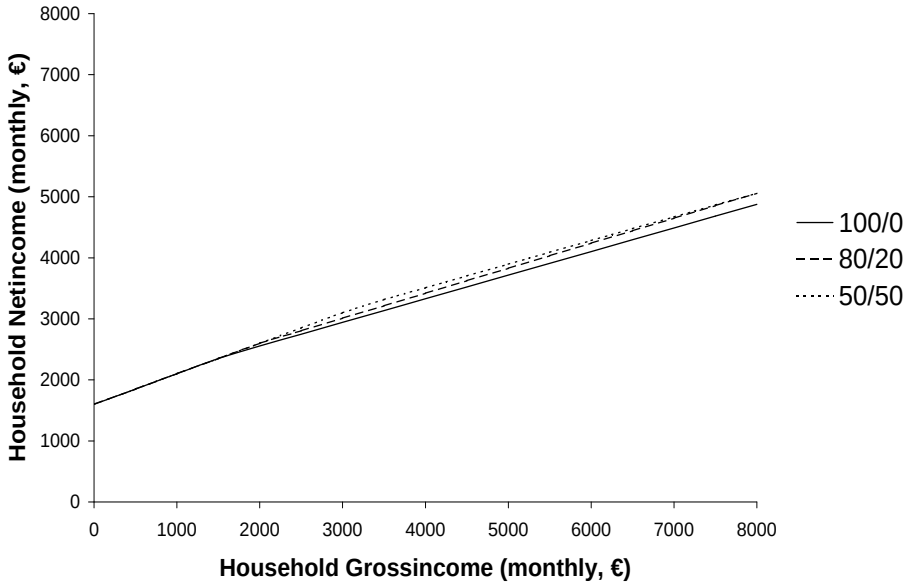
deficit and due to low tax rates labor supply would increase in total. But interestingly, we find that only men and single women increase their labor supply, while many women living in couple households refrain from the labor market. In addition, our distribution analysis shows that the income distribution indeed has widened despite the high transfer payments.

5 Results for the Budget Neutral Alternatives

We further analyze two alternative reform scenarios that yield budget neutrality and thereby extend the existing literature. For the first alternative we increase revenues by adjusting the tax rate. For the second alternative we adjust the withdrawal rate. In both cases the basic income is fixed at 800 Euro (500 Euro for children) and health lump sum payments still amount to 200 Euro. Thus, every citizen with no income still receives a transfer of 600 Euro in the two alternative basic income settings.

For the first alternative it is necessary to increase the tax rate (t_2) to 61.3% in order to yield a budget neutral reform before labor supply adjustments. Following Equation 1 the tax credit in this scenario then amounts to 981 Euro instead of 400 Euro in the original proposed reform. All Citizens up to a gross income of 1,200 Euro again benefit from a negative income tax. But the intra-household working decision described in Section 2.2 for the original basic income concept changes as we adjust the tax rate and consequently the tax credit. Figure 4 shows that the household decision is again irrelevant as long as everyone's income lies below the threshold of 1,600 Euro. From this point on households

Figure 4: The Intra-household Working Decision: Alternative with Adjusted Tax Rate

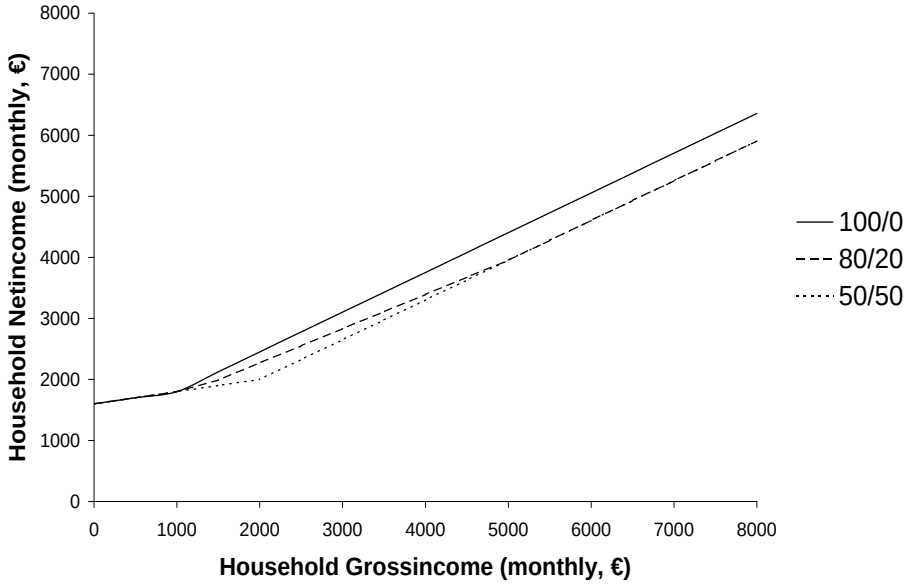


Data Source: Own calculations.

sharing work equally yield the highest net incomes in this alternative basic income reform. As the tax rate in this scenario is higher than the withdrawal rate it is optimal to avoid high taxes by sharing income equally between the spouses. If the gross income is too high to avoid high tax rates for both spouses, then sharing employment is still optimal in comparison to a single earner household, because the tax credit exceeds the basic income by 181 Euro. Hence, the household optimizes net income if both partners work and receive the high tax credit. The income difference between households sharing work equally (50/50) and the single earner household (100/0) amounts to 181 Euro for households with high incomes. That amount is exactly the difference between the high tax credit and the lower basic income. Hence, the tax design in which the tax credit exceeds the basic income gives an incentive to share work equally, while the originally proposed reform design with the tax credit being smaller than the basic income yields disincentives for a secondary earner.

For the second budget-neutral scenario we set the withdrawal rate (t_1) to 80%, which is similar to the current withdrawal rate in Germany. In this case the tax rate yielding a budget neutral reform before labor supply adjustments is 34.9%, which is slightly higher as in the original proposed reform concept. These adjustments determine a shift of the threshold from 1,600 Euro per month to 1,000 Euro and a tax credit of 349 Euro. A negative income tax, thus, results for gross incomes of up to 750 Euro. This set-up causes disincentives for secondary earners similar to the original proposed basic income concept (Figure 5). The household decision now is already relevant at the threshold of 1,000 Euro. Above the threshold a household optimizes net income only in case of a single earner household (100/0). Similar to the original reform proposal the tax credit is by 451

Figure 5: The Intra-household Working Decision: Alternative with Adjusted Withdrawal Rate



Data Source: Own calculations.

Euro lower than the basic income. Thus, a possible secondary earner has an incentive to exit the labor market in order to receive the comparably high basic income.

These theoretical considerations are reflected by our estimated labor supply reactions in Table 3. Raising the tax rate to 61.3% or the withdrawal rate to 80% reverses labor supply effects of the original proposed reform (see Table 2). In contrast to an additional labor supply of about 1 million full-time equivalents, the alternative with an adjusted tax rate reduces labor supply by 188,886 full-time equivalents (-0.89%) and rising the withdrawal rate effects labor supply negative by 3,749 full-time equivalents (-0.02%).

Employees work less with regard to the extensive and intensive margin, if we rise the tax rate. Again, especially women living in couple households adjust their behavior and stop working to quite a large extent (-335,150 persons). Hence, women in couple households reduce their labor supply although the first alternative tax system gives an incentive to share work equally within the household (Figure 4). Their negative labor supply, thus, must solely be driven by the income effect due to a quite high basic income for children and women's estimated high leisure preference. The participation of all other subgroups increases but to a lower extend as in the original basic income concept. With regard to working hours (intensive margin) we observe a slight decrease in labor supply of about 1% for almost all groups, which adds up to a reduction in working hours of 135,882 full-time equivalents. Hence, the positive effects of the original reform proposal are reversed, as a consequence of the higher tax rates.

Table 3: Labor Supply Effects - Budget Neutral Alternatives

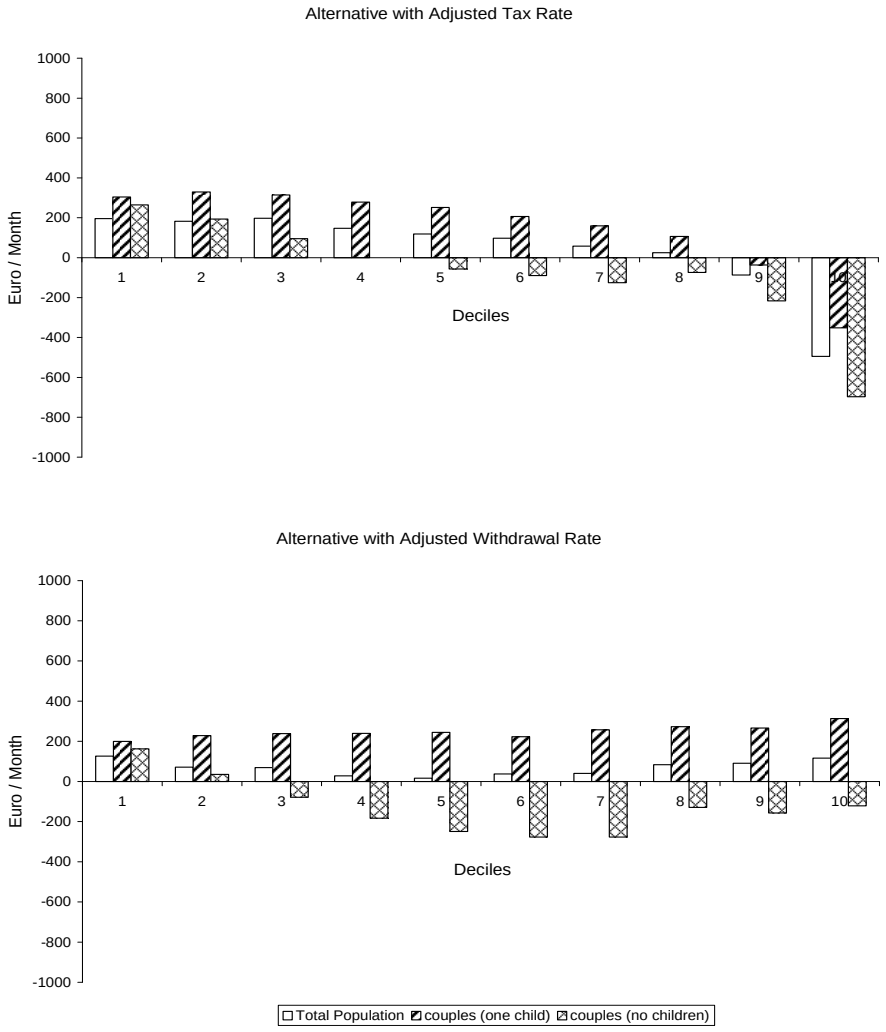
	Participation		Working Hours		Total	
	Persons	%	FTE	%	FTE	%
	Alternative with adjusted tax rate					
Total	-119,199	-0.51	-135,882	-0.64	-188,886	-0.89
Men	88,392	0.74	-72,598	-0.59	11,527	0.09
Women	-207,591	-1.85	-63,284	-0.71	-200,413	-2.25
Singles						
Men	43,391	1.32	-5,369	-0.23	35,293	1.49
Women	127,559	3.71	15,286	0.58	120,476	4.58
Couples						
Men	45,001	0.47	-67,230	-0.74	-23,766	-0.26
Women	-335,150	-2.92	-78,570	-1.35	-320,889	-5.51
	Alternative with adjusted withdrawal rate					
Total	-705,493	-3.04	447,862	2.11	-3,749	-0.02
Men	89,457	0.75	185,428	1.50	282,201	2.29
Women	-794,950	-7.09	262,434	2.95	-285,949	-3.21
Singles						
Men	42,699	1.30	60,442	2.55	104,955	4.42
Women	22,426	0.65	108,208	4.11	131,684	5.00
Couples						
Men	46,759	0.49	124,986	1.38	177,245	1.96
Women	-817,376	-7.11	154,226	2.65	-417,634	-7.17

Data Source: SOEP 2004, own calculations.

The second alternative concept creates even higher disincentives for women in couple households. 817,376 women in couple households stop working. In this setting disincentives for secondary earners (Figure 5), the income effect due to the child basic income and women's high preference for leisure in combination cause large negative labor supply reactions. In addition, rising the withdrawal rate mainly affects women's labor supply, as they very often work in part-time jobs with low incomes. Due to lower tax rates for high incomes, results for the intensive margin are positive for all groups. The positive effects on working hours mitigate, but cannot outweigh the very negative effects on participation. Hence, the total labor supply effect is negative but close to zero.

The comparison of the two alternatives shows that the design of a basic income is crucial with regard to labor supply reactions. The relation between the basic income and the tax credit decides whether secondary earners are dis- or encouraged to participate on the labor market. A high tax credit encourages to share work equally between the spouses. But a high tax credit in the basic income concept discussed here also comes along with a high tax rate, which yields negative labor supply reactions. In the setting with a high withdrawal rate the high basic income discourages couple households to participate on the labor market equally. However, keeping the withdrawal rate at a high level (80%) and

Figure 6: Percentile Analysis: Budget Neutral Alternatives



Data Source: SOEP 2004, own calculations.

therefore lowering the tax rate increases labor supply on the intensive margin. Hence, both alternatives yield ambiguous results.

The percentile analysis for the alternative concepts are presented in Figure 6. The high income tax of the first budget neutral alternative yields very high losses in the 9th and 10th decile. Couples without children lose already from the 5th decile on, because they no longer benefit from income splitting. For the second alternative with an adjusted withdrawal rate we observe in total gains for all deciles. In this scenario the change to individual taxation again creates losses for couples without children, which are quite high in the middle of the income distribution. Families with children benefit by both reform scenarios and show the highest gains. This visualizes the positive income effect due to a high child benefit.

Inequality measures for the alternative with a high tax rate indicate a strong reduction in income inequality, while inequality in case of the high withdrawal rate even seems to

increase. The Gini coefficient decreases for the first alternative from 0.26 to 0.22 and increases for the second alternative from 0.26 to 0.29. The Atkinson measure A(0.5) decreases for the first alternative from 0.05 to 0.04 and A(1) from 0.10 to 0.07. This indicates an improvement of the lower deciles compared to the upper deciles. For the second reform alternative A(0.5) increases from 0.05 to 0.06 and A(1) from 0.10 to 0.12. Hence, inequality measures support the result of the percentile analysis, that the higher tax rate leads to redistribution from the top to the bottom deciles. For the second alternative all deciles gain in total, but the upper deciles seem to benefit more from the low tax rate.

The results with regard to labor supply and distribution show the general trade-off between equity and efficiency. A high tax rate increases equity but decreases work incentives. Instead, a high withdrawal rate leads to more inequality but yields higher work incentives.

6 Conclusion

The introduction of an unconditional basic income in Germany would replace all current social transfers by a negative income tax scheme that guarantees every citizen a minimum income regardless of the employment status. The reform proposal discussed in this paper combines several instruments such as a change from joint to individual taxation and the introduction of a negative income tax, a flat tax system and lump sum payments for health insurance. The proposal of such a basic income concept has an appealing simplicity and could indeed reduce the complexity of the current tax system.

But our simulation results show that the originally proposed concept of the German conservative party would yield a very high budgetary deficit. Hence, the original basic income design seems not feasible, despite very positive labor supply reactions. We therefore estimate the effects of two budget-neutral alternatives – one with an adjusted tax rate and one with an adjusted withdrawal rate.

Theoretical labor supply considerations point out, that we need to focus on the impact of a shift from joint to individual taxation and the introduction of a negative income tax, as these changes directly affect labor supply decisions in the family context. We show that despite the introduction of individual taxation – which annuls the current disincentives of secondary earners in the current joint taxation system – the basic income concept nevertheless can induce disincentives for secondary earners to participate on the labor market. Due to the introduction of a negative income tax that is based on individual income, households optimize their joint income in the original proposed scenario and the alternative with an adjusted withdrawal rate, if they opt for a single earner in the family. In basic income designs, in which the unconditional basic income (for low incomes) is

higher than the tax credit (for high incomes) single earner households always benefit from the high unconditional basic income for the partner, who is not in work. In contrast, the alternative with a high tax rate gives an incentive to share work equally between the spouses, as the tax credit is higher than the basic income.

According to theory, we estimate for the alternative with a high withdrawal rate very negative labor supply reactions of women in couple households. This result is driven by the disincentives of the high unconditional basic income and the estimated high leisure preferences of women. Although the alternative for which we adjust the tax rate (high tax credit) does not induce disincentives for secondary earners, we still observe a (comparably small) reduction in the labor supply of women living in couple households. This reaction, thus, must be caused by a high income effect due to the high basic income for children and the women's estimated high preference for leisure. Taking distributional analysis and intensive labor supply reactions into account, the general equity-efficiency trade-off is unveiled. A high tax rate yields negative labor supply reactions (intensive margin), while the income inequality of the status quo seems to be mitigated in this case. In contrast, a high withdrawal rate affects the working hours not as negative, but seems to widen the income distribution.

We need to add here that our estimations do not account for the time women spent caring for their children. This in fact can cause an overestimation of women's leisure preferences, which means that our estimated negative effects can be seen as an upper bound. Furthermore, our microsimulation study can only examine the effects of a basic income on labor supply. Demand side adjustments or restrictions are neglected here.

In order to circumvent the equity-efficiency trade-off, future research should try to find tax rates which strike a balance between the efficiency of work incentives and income inequality. At the same time, a basic income concept must guarantee budget neutrality and avoid disincentives for secondary earners. Thus, our analysis of two extreme scenarios – with either a high tax rate or a high withdrawal rate – could be complemented by a simulation of a promising scenario which yields budget neutrality by raising both tax parameters to the same level. Such a scenario would avoid the revealed disincentives for secondary earners in the basic income concept.

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A Appendix

Table A.1: Maximum Likelihood Estimation: Single Women

	coeff	SE	z	$P < z$
Disposable Income	7.40	2.86	2.62	0.01
$DisposableIncome^2$	0.23	0.05	4.26	0.00
Disposable Income X Leisure	-2.09	0.61	-3.45	0.00
Leisure	77.20	19.93	3.87	0.00
$Leisure^2$	-7.82	2.38	-3.29	0.00
Leisure x High-skilled	1.85	1.31	1.41	0.16
Leisure x Low-skilled	2.80	1.37	2.05	0.04
Leisure x East	-0.14	0.38	-0.37	0.71
Leisure x Nationality	1.55	0.61	2.53	0.01
Leisure x Age	0.38	0.44	0.86	0.39
$Leisure * Age^2$	0.003	0.001	2.26	0.02
$Leisure^2 * Age$	-0.07	0.06	-1.25	0.21
Leisure x Disabled	-0.16	1.40	-0.11	0.91
Leisure x Children < 7	4.30	0.56	7.70	0.00
Leisure x Children 7-16	1.16	0.26	4.48	0.00
Leisure x Children ≥ 17	0.50	0.31	1.63	0.10
Dummy Full-time Employment	0.40	0.38	1.05	0.29
Dummy Part-time	-1.43	0.29	-4.99	0.00
N		*3890*		
Log likelihood		*-976.26*		

Data Source: SOEP 2004, own calculations.

Table A.2: Maximum Likelihood Estimation: Single Men

	coeff	SE	z	$P < z$
Disposable Income	9.76	2.71	3.60	0.00
$DisposableIncome^2$	0.08	0.04	1.76	0.08
Disposable Income X Leisure	-2.35	0.59	-4.00	0.00
Leisure	68.55	21.17	3.24	0.00
$Leisure^2$	-6.18	2.49	-2.49	0.01
Leisure x High-skilled	1.71	2.14	0.80	0.43
Leisure x Low-skilled	2.31	2.19	1.06	0.29
Leisure x East	0.47	0.37	1.28	0.20
Leisure x Nationality	0.76	0.85	0.90	0.37
Leisure x Age	-0.79	0.47	-1.69	0.09
$Leisure^2 * Age$	0.10	0.06	1.67	0.10
$Leisure * Age^2$	0.001	0.001	0.69	0.49
Leisure x Disabled	0.96	0.88	1.09	0.28
Dummy Full-time Employment	3.94	0.26	14.86	0.00
N		*3000*		
Log likelihood		*-669.23*		

Data Source: SOEP 2004, own calculations.

Table A.3: Maximum Likelihood Estimation: Flexible Couples

	coeff	SE	z	$P < z$
Disposable Income	17.11	2.28	7.52	0.00
$DisposableIncome^2$	0.27	0.04	6.17	0.00
Leisure Husband x Leisure Wife	-2.51	0.53	-4.70	0.00
Disposable Income x Leisure Husband	-2.85	0.33	-8.67	0.00
Disposable Income x Leisure Wife	-1.48	0.29	-5.14	0.00
Leisure Husband	51.15	7.08	7.22	0.00
$LeisureHusband^2$	-0.93	0.60	-1.56	0.12
Leisure Husband x East	-9.49	2.69	-3.53	0.00
Leisure Husband x Nationality	-0.34	0.42	-0.80	0.42
Leisure Husband x Leisure Wife x East	2.41	0.67	3.60	0.00
Leisure Husband x Leisure Wife x Nationality	-0.16	0.10	-1.53	0.13
Leisure Husband x High-skilled	2.16	1.28	1.69	0.09
Leisure Husband x Low-skilled	3.00	1.30	2.30	0.02
Leisure Husband x Age	-0.35	0.09	-3.70	0.00
$LeisureHusbandxAge^2$	0.01	0.00	4.42	0.00
Leisure Husband x Disabled	0.56	0.77	0.73	0.47
Leisure Wife	94.39	7.03	13.42	0.00
$LeisureWife^2$	-8.18	0.62	-13.16	0.00
Leisure Wife x East	-11.45	2.55	-4.50	0.00
Leisure Wife x Nationality	-0.34	0.42	-0.80	0.42
Leisure Wife x High-skilled	1.75	0.78	2.24	0.03
Leisure Wife x Low-skilled	1.93	0.82	2.35	0.02
Leisure Wife x Age	-0.34	0.09	-3.56	0.00
$LeisureWife * Age^2$	0.01	0.00	4.23	0.00
Leisure Wife x Disabled	0.19	1.43	0.13	0.89
$LeisurexChildren < 7$	3.51	0.26	13.56	0.00
Leisure x Children 7-16	1.28	0.12	10.83	0.00
$Leisure * Children \geq 17$	0.52	0.13	4.00	0.00
Dummy Full-time Employment Husband	4.88	0.20	24.86	0.00
Dummy Full-time Employment Wife	0.89	0.24	3.74	0.00
Dummy Part-time Employment Wife	-0.53	0.21	-2.57	0.01
Dummy Employment Both Spouses	-0.16	0.18	-0.86	0.39
N		*65075*		
Log likelihood		*-5859.73*		

Data Source: SOEP 2004, own calculations.

Table A.4: Maximum Likelihood Estimation: Couples with Inflexible Partner

	coeff	SE	z	$P < z$
Disposable Income	0.80	1.77	0.45	0.65
$DisposableIncome^2$	0.56	0.08	7.35	0.00
Disposable Income x Leisure	-1.26	0.38	-3.34	0.00
Leisure	63.95	21.94	2.91	0.00
Leisure x Household Head Female	0.53	0.74	0.71	0.48
Leisure	-5.41	2.69	-2.01	0.04
Leisure x Leisure inflex. Spouse	0.52	0.25	2.11	0.04
Leisure x High-skilled x Female	0.55	1.17	0.47	0.64
Leisure x Low-skilled x Female	1.53	1.24	1.23	0.22
Leisure x High-skilled x Male	-0.74	1.23	-0.60	0.55
Leisure x Low-skilled x Male	-1.15	1.33	-0.87	0.39
Leisure x Age	-0.87	0.47	-1.88	0.06
$LeisurexAge^2$	0.01	0.00	3.26	0.00
$Leisure^2 * Age$	0.06	0.05	1.05	0.29
Leisure x East	1.61	0.65	2.47	0.01
Leisure x East x Household Head Female	-3.45	0.72	-4.78	0.00
Leisure x Nationality	-1.61	0.57	-2.79	0.01
$LeisurexChildren < 7$	1.22	0.69	1.77	0.08
Leisure x Children 7-16	1.00	0.27	3.66	0.00
$LeisurexChildren \geq 17$	0.51	0.22	2.33	0.02
Leisure x Male x Disabled	0.71	1.15	0.62	0.53
Dummy Part-time Employment Wife	-0.22	0.22	-1.00	0.32
Dummy Full-time Employment Wife	0.84	0.34	2.49	0.01
Dummy Full-time Employment Husband	3.59	0.35	10.28	0.00
$DummyEmploymentxChildren < 7$	-0.44	0.40	-1.09	0.28
Dummy Employment x Children 7-16	0.27	0.16	1.70	0.09
N		*4610*		
Log likelihood		*-1178.85*		

Data Source: SOEP 2004, own calculations.