

## ***The Distributional Effects of a Flat Tax Reform in Germany - a Microsimulation Analysis***

### **1. Introduction**

The simplification of the tax system is a key objective of many income tax reform proposals. This is not only because complexity leads to high compliance costs for taxpayers. The complexity of the income tax system is also seen as an obstacle to fairness and efficiency. For instance, complexity is thought to be an obstacle to achieving a fair distribution of the tax burden because it might allow taxpayers with high incomes to use tax loopholes and reduce their tax burden.

The present paper quantifies the impact of tax simplification in combination with a flat tax rate on the distribution of after tax income and the marginal income tax rates faced by different types of taxpayers. The change in marginal income tax rates is of interest because marginal tax rates may be considered as rough indicators for the distortions caused by the tax system. Our analysis is based on our simulation model for the German tax and transfer system (FiFoSiM) using income tax microdata and household survey data.<sup>1</sup>

We model tax simplification as the abolition of a set of deductions from the tax base included in the German income tax system. If these measures are combined with a reduction of income tax rates to preserve revenue neutrality, the distributional impact depends on the type of rate schedule adjustment. We also consider the effect of these tax measures on the marginal income tax rate.

In the literature, quantitative studies of the impact of tax simplification on the efficiency of the tax system and the distribution of income exist only for the U.S. In a recent contribution, Gale and Rohaly (2003)<sup>2</sup> study the effect of different tax simplification proposals. Among other things, they consider the introduction of a flat rate income tax, combined with a value added tax reform. They find that such a tax reform would increase the tax burden of the middle class and reduce the tax burden for very high and very low incomes. Gale et al. (1996)<sup>3</sup> analyse the effects of introducing a flat tax in the US according to the concept of Hall and Rabushka (1995)<sup>4</sup> and similar versions. They conclude that high income households profit most while households with low incomes suffer from a flat tax reform.

The set-up of the paper is organised as follows: chapter 2 contains a short description of FiFoSiM, chapter 3 presents the tax simplification scenarios. Chapter 4 illustrates the effects on distribution. Chapter 5 presents the effects on the marginal tax rates as a measure for efficiency, before chapter 6 summarises and concludes this paper.

### **2. FiFoSiM: Database and Model**

Our analysis is based on a microsimulation model for the German tax and transfer system (FiFoSiM) using income tax and household survey microdata. The approach of FiFoSiM is innovative in so far

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This paper is a summary of my presentation held at the CEF - International Academic Forum on Flat-Tax-Rate on February 3rd 2006. A more detailed analysis of the economic effects of tax simplification in combination with tax rate schedule reforms can be found in: Fuest, C., Peichl, A. and T. Schaefer (2006), Does Tax Simplification yield more Equity and Efficiency? An empirical analysis for Germany. University of Cologne, Working Paper.

<sup>1</sup> The model is described in: Fuest, C., Peichl, A. and T. Schaefer (2005): Dokumentation FiFoSiM: Integriertes Steuer-Transfer-Mikrosimulations- und CGE-Modell, Finanzwissenschaftliche Diskussionsbeiträge Nr. 05 - 03. A specific feature of FiFoSiM is the use of a dual database of FAST- and SOEP-data.

<sup>2</sup> Gale, W. and Rohaly, J. (2003). Effects of Tax Simplification Options on Equity, Efficiency, and Simplicity: A Quantitative Analysis.

<sup>3</sup> Gale, W. G., Houser, S. and Scholz, J. K. (1996). Distributional Effects of Fundamental Tax Reform, in H. J. Aaron and W. G. Gale (eds), Economic Effects of Fundamental Tax Reform, The Brookings Institution, Washington, D. C., pp. 281.320.

<sup>4</sup> Hall, R. E. and Rabushka, A. (1995). The Flat Tax, 2nd edn, Hoover Institution Press, Stanford.

as it creates a dual database using two microdata sets for Germany: FAST98 and GSOEP. FAST98 is the income tax scientific use-file 1998 (FAST 98) containing a 10%-sample of the German federal income tax statistics. FAST98 includes the relevant data from income tax files of nearly 3 million households in Germany. Our second data source, the German Socio-Economic Panel (GSOEP), is a representative panel study of private households in Germany. In 2003 GSOEP consists of more than 12,000 households with more than 30,000 individuals. A specific feature of FiFoSiM is the simultaneous use of both databases allowing for the imputation of missing values or variables in the other dataset.

The layout of FiFoSiM follows several steps: First the database is updated using the static ageing technique which allows controlling for changes in global structural variables and a differentiated adjustment for different income components of the households. Second, we simulate the current tax system in 2006 as the benchmark for different reform scenarios which are computed in the third step.

The modelling of the tax and transfer system uses the technique of microsimulation. FiFoSiM computes individual tax payments for each case in the sample considering gross incomes and deductions. The individual results are multiplied by the individual sample weights to extrapolate the fiscal effects of the reform with respect to the whole population. A detailed description of the FiFoSiM model can be found in Fuest et. al (2005).

### 3. Tax Simplification Scenarios

The basic steps for the calculation of the personal income tax under German tax law are as follows. The first step is to determine the income of a taxpayer from different sources and to allocate it to the seven forms of income defined in the German income tax law. For each type of income, the tax law allows for certain income related

expenses. The second step is to sum up these incomes. Third, deductions like contributions to pension plans or charitable donations are taken into account, which gives taxable income as a result. Finally, the income tax is calculated by applying the tax rate schedule to taxable income.

Tax base simplification is modelled as the abolition of a set of specific deductions from the tax base included in the German income tax system. Our choice of simplification measures is influenced by the German policy debate about existing tax breaks and deductions. Naturally, the analysis is restricted by the availability of data. The effects of various tax simplification scenarios are calculated in the microsimulation model FiFoSiM. Tax simplification in terms of tax break abolition generates additional revenue. As we intend to design a potential tax reform without revenue effects, we model a flat tax rate of 30% and a basic tax allowance of 9500 € .

### 4. Distributional Effects

To analyse the distributional effects of different reform scenarios we compute different distributional measures based on equivalence weighted household net incomes.<sup>5</sup> Furthermore, as an innovative element of our analysis, we estimate the polarisation effects of each alternative. Distributional measures have been widely used in simulation studies, whereas polarisation measures have been seldom respectively never used in microsimulations (for Germany).<sup>6</sup> Generally speaking, polarisation is the occurrence of two antipodes. A rising income polarisation describes the phenomenon of a declining middle class resulting in an increasing gap between rich and poor. The proportion of middle income households is declining while the shares of the poor and the rich are both rising. As a distributional measure we compute the Gini-Index and the measure of Schmidt (2004)<sup>7</sup> as a polarisation index.

<sup>5</sup> We use the so called "new OECD-scale" which weights the household head with a factor of 1, household members over the age of 15 with 0.5, and under 15 with 0.3. The households net income is divided by the sum of the individual weights of each member (=equivalence factor) to compute the equivalence weighted household income.

<sup>6</sup> The measurement of polarisation was introduced by Wolfson, M. C. (1994). *When Inequalities Diverge*, American Economic Review 84(2): 353-358, and Esteban, J. and Ray, D. (1994). *On the Measurement of Polarization*, Econometrica 62(4): 819-851, to analyse the phenomenon of the „declining middle class" in the United States which could not be satisfactorily explained by standard inequality measures (see Schmidt, A. (2004). *Statistische Messung der Einkommenspolarisation*, Eul-Verlag, Lohmar. for a survey). The distinction between inequality and polarisation can be vividly explained using the extremes: minimal inequality and minimal polarization is given by a uniform distribution of income. Maximal inequality is given if N-1 people realize a zero income and the remaining person receives the whole income. Polarisation is maximal if there are two (almost identically large) groups which are very heterogeneous regarding their incomes (heterogeneity between groups) but very homogeneous inside each group (homogeneity within groups).

<sup>7</sup> Schmidt (2004) creates a polarisation index which in analogy to the gini index (lorenz curve) is based on a polarisation curve for a better comparability of the results and their interpretations.

**Table 1: Change of Households Equivalence Weighted Net Income In Percent**

	kumAB	E061	Flat-Tax	kumAB1	kumAB2
1. Decile	-0,06	0,00	0,00	-0,06	-0,06
2. Decile	-0,30	0,19	0,08	-0,03	-0,20
3. Decile	-0,75	0,95	0,28	0,38	-0,45
4. Decile	-1,12	1,57	-0,05	0,63	-1,23
5. Decile	1,35	1,87	-0,46	0,67	-1,90
6. Decile	-1,48	2,10	-0,86	0,73	-2,45
7. Decile	-1,62	2,22	-1,11	0,68	-2,81
8. Decile	-1,78	2,18	-1,07	0,49	-2,84
9. Decile	-2,11	2,01	-0,61	-0,01	-2,51
10. Decile	-2,16	1,40	5,87	-0,70	4,27
Gini	-0,55	0,12	2,56	-0,46	2,32
PolS	-0,81	0,72	-0,49	-0,03	-1,33
P 90/10	-2,26	1,97	-0,14	-0,21	-2,03

Source: own calculations based on FiFoSiM.

The main results are presented in table 1. We simulate the percentage changes of the mean income in each decile and the distributional and polarization measures compared to the status-quo for each tax rate schedule adjustment, the simplification bundle (kumAB) and the combinations of rate schedule reforms and tax base simplification.

The first column of table 1 shows the cumulated effects of the simplification bundle. The accumulated measures of tax simplification burden the higher incomes more heavily than the middle and the lower incomes. Inequality and polarisation are both reduced.

The isolated effects of changes in the tax schedule are as follows. The adjustment to the right of the current schedule (E061) increases inequality as well as polarisation. The flat rate tax strongly increases inequality while the polarisation index decreases. The obvious winner of a flat tax rate is the 10th decile due to lower marginal rates and to some extent the first decile while the middle to upper deciles suffer from an increased tax charge due to the flat tax reform. These effects result in an overall increase in the gini index.<sup>8</sup>

The revenue neutral combination of the tax base simplification bundle with a tax schedule

adjustment to the right (kumAB1) decreases both the inequality and the polarisation indices, whereas the combination with a flat-tax (kumAB2) increases the inequality but reduces the polarisation. Given these results, we can conclude that revenue neutral tax simplification does not necessarily lead to redistribution from poor to rich. The combination with the adjustment of the current tax schedule even leads to a decrease of inequality, i.e. the simplification of the tax system can lead to a more equal distribution of after tax income. More inequality only arises if tax base simplification is combined with the introduction of a flat rate tax.

## 5. Tax Simplification and the Efficiency of the Tax System

There are many ways in which the simplification of the tax system affects its efficiency. In this section, we analyse the effect of tax simplification on the marginal income tax rate faced by different groups of taxpayers. The underlying idea is that the marginal income tax rate affects the labour supply and savings incentives. Here, we focus on the marginal labour income tax rate. The results are summarised in table 2.

It turns out that tax base simplification without tax rate adjustments increases the marginal tax rate

<sup>8</sup> The decrease in polarisation is surprising at first glance, but this result can be attributed to the following two effects: The heterogeneity between the two groups decreases because of the higher tax burden for most people above the median income and because of a decrease of the tax liability of some people below the median. The homogeneity within the upper group decreases as well because of the opposite directions of the effects in those deciles. Both effects lead to a decrease in the polarisation index.

**Table 2: Marginal Tax Rates and Rate Changes**

Dec.	E06	E061	Diff	Flat-Tax	Diff	kumAB1	Diff	kumAB2	Diff
1	0,00	0,00	-0,00	0,00	-0,00	0,00	-0,00	0,00	0,00
2	2,40	0,43	-1,97	0,92	-1,48	0,58	-1,82	1,29	-1,11
3	14,60	11,35	-3,24	16,73	2,13	13,80	-0,80	19,76	5,17
4	20,34	18,39	-1,95	21,95	1,60	19,55	-0,79	22,69	2,35
5	23,25	21,30	-1,95	23,39	0,15	22,42	-0,83	24,19	0,95
6	24,71	22,93	-1,78	25,64	0,93	24,05	-0,65	26,57	1,87
7	26,18	24,81	-1,37	27,06	0,89	25,82	-0,35	27,78	1,61
8	28,04	27,10	-0,94	28,77	0,73	27,90	-0,14	29,13	1,09
9	30,07	29,44	-0,64	29,46	-0,61	30,06	-0,01	29,57	-0,50
10	35,22	34,81	-0,41	29,44	-5,78	35,92	0,70	29,51	-5,71

Source: own calculations based on FiFoSiM.

for all taxpayers. This is not surprising, given the progressive nature of the income tax schedule. Combining these measures with a reduction of tax rates over the entire income tax schedule (kumAB1) reduces the marginal tax rate for almost all taxpayers with the exception of the highest income decile. The combination with a flat rate tax (kumAB2), in contrast, reduces the marginal tax rate considerably (by five percentage points) for the highest income decile. For the middle income deciles, the marginal tax rate increases, especially for the third and the fourth income decile. This suggests that the efficiency gains that can be achieved through tax simplification, combined with the introduction of a flat rate tax, are limited. This is mainly due to the fact that revenue neutrality requires a flat tax rate of 30%. If the broadening of the tax base goes beyond the measures considered here, revenue neutrality can be achieved at a lower statutory tax rate. In this case, the reduction of the marginal tax rate will also be lower.

## 6. Summary and Conclusion

In this paper, we have examined the effects of tax simplification on the income distribution and marginal income tax rates. Our results suggest that flat tax reforms combining tax base broadening with a single tax rate can increase inequality at the expense of the upper middle class. This might be the reason for the dispute about the political implementation of a flat tax reform despite the incontestable advantages of a flat tax rate regarding tax administration. Thus it might be advisable to separate the tax simplification objective from tax rate schedule issues.

Finally, income distribution is only one relevant aspect of tax reforms. If a higher national income, more efficiency or better incentives can be achieved through an income tax reform, higher inequality of income distribution might be deemed acceptable.

Whether tax simplification leads to more fairness in terms of higher after-tax income equality depends on the simplification method. The tax base simplification package considered here, combined with an adjusted direct progressive tax rate reduces the inequality of income distribution maintaining revenue neutrality. In this regard, more fairness through tax simplification is possible.