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Revenue and distributional effects of the current tax reform proposals in Germany: an evaluation by microsimulation

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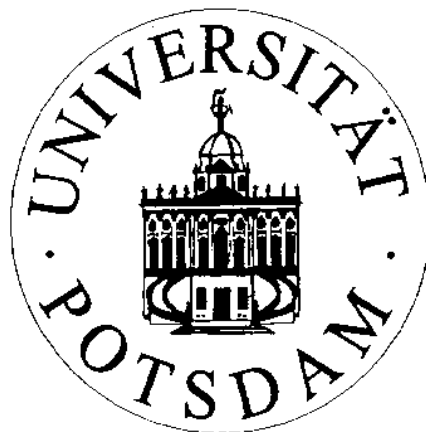
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Revenue and Distributional Effects of the Current Tax Reform Proposals in Germany – An Evaluation by Microsimulation

von

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Diskussionsbeitrag Nr. 26
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**Revenue and Distributional Effects of the Current Tax Reform Proposals in
Germany – An Evaluation by Microsimulation**

Juli 1999

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Revenue and Distributional Effects of the Current Tax Reform Proposals in Germany – An Evaluation by Microsimulation

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A. Introduction

The recent change in political leadership in Germany has important implications for tax policy. Shortly after the election, the new government presented plans to change the tax laws. The proposed changes included a reform of income tax, the implementation of “green taxes”, while at the same time social security contributions, e.g., the contributions to the old-age insurance, would be reduced.

The aim of the proposed income tax reform is to decrease the tax burden for most taxpayers, and to abolish some tax exemptions and deductions. The blueprint has been devised to achieve greater justice within tax apportionment and regulation. The major questions these new proposals raise are: what kind of distributional effects will result from these plans? Who pays less and who more? Has the new government chosen the right means to achieve its goals?

In our analysis we concentrate on private households. Due to a lack of data, we exclude enterprises. The primary goal is an integrated analysis of how the tax burden will change for all kinds of taxes and social security contributions. For this purpose, we have to use an effective model of analysis of the tax system.

The chosen model adopts the tradition of a group of microsimulation-models developed first by Orcutt¹ and some grouped simulation models developed in different projects by Petersen.²

¹ See for the first approach Orcutt, G. (1957) and for the further development Orcutt, G.; Merz, J. and Quinke, H. (1986) and Harding, A. (1996).

² For grouped models see Brunner, J. K. and Petersen, H. -G. (1990).

One new aspect is that the model has been designed such that it is capable of analysing direct taxes, indirect taxes and social security contributions simultaneously.

The paper is organised as follows. First we present the background relating to the model we have chosen to analyse the distributional and revenue effects of the reform. We then give a brief introduction to the workings of the model, describe the data, the setup of the integrated microdata file and the weights and updates used to represent the actual population. Then we validate the model and describe its possibilities and limitations. Finally, we outline the simulated reform proposals and conclude with a discussion of the revenue and distributional effects of the proposals for private households.

B. The Model

The microsimulation-model is static and mostly deterministic in nature. At the current stage of its development we can analyse the first-order effects of nearly all types of indirect and direct taxes. The model is modular in structure, and includes modules for direct and indirect taxes, as well as for transfers and social security contributions. Figure 1 provides an overview of the microsimulation-model, from raw data sets to calculation modules.

The direct tax module consists of patterns for income tax, church tax, property taxes and car tax. Value added tax (VAT), gasoline tax, tobacco tax, insurance tax and taxes on alcoholic beverages are included in the indirect tax module. The social security contributions module contains the design of old-age insurance, health insurance, unemployment insurance and nursing cost insurance. The module for transfers covers child and housing benefits, education benefits, social aid and old-age benefits; the last three, however, are not calculated endogenously.

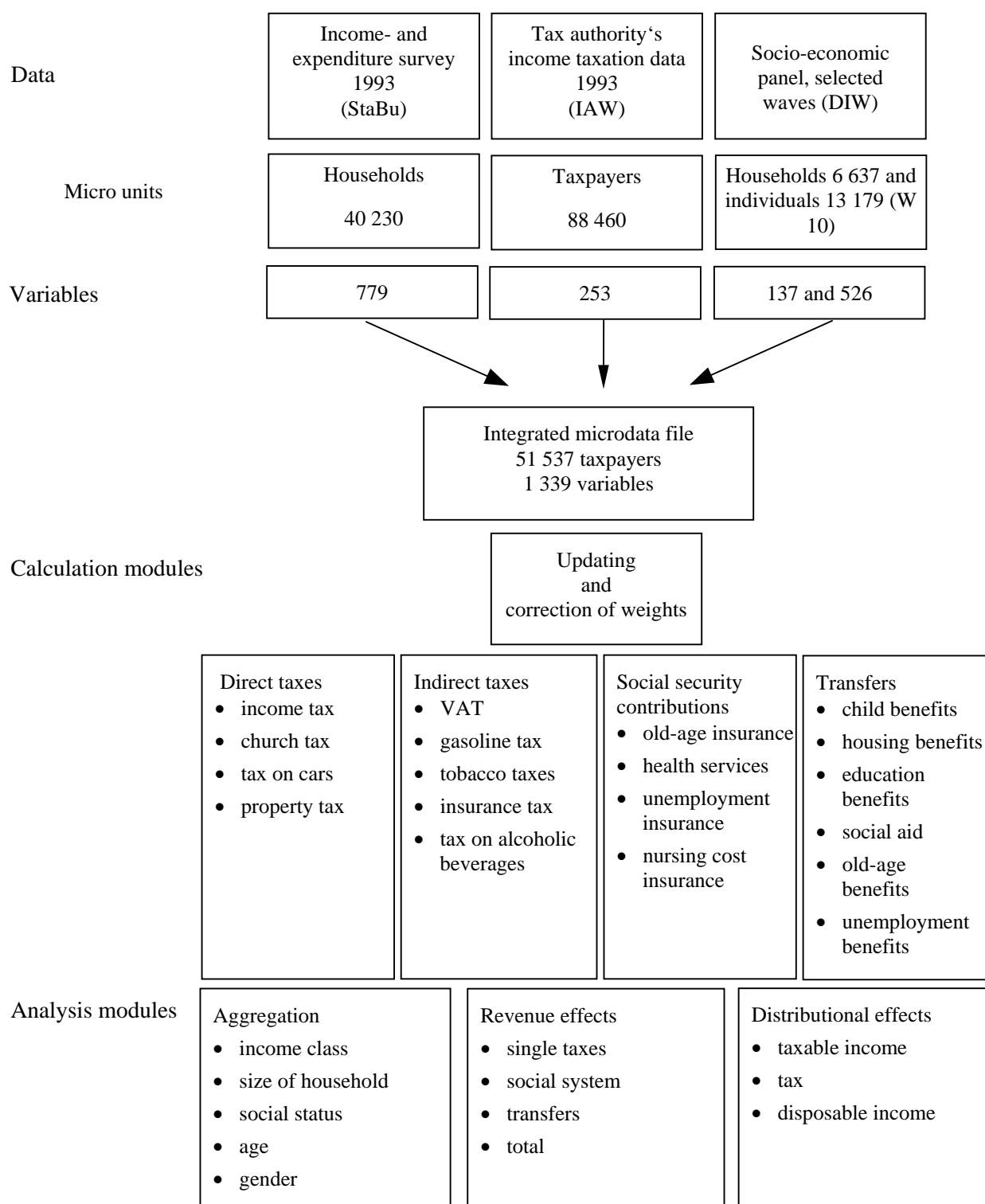
(i) Data

For the construction of a tax and transfer microsimulation-model, one needs detailed information about personal income distribution. In Germany there are not many notable prospective microdata sets available for use. The first accessible is the income and expenditure survey (EVS), compiled by the German Federal Statistical Office in 1993.³ It

³ The content of the income and expenditure survey can be found in Statistisches Bundesamt (1997b).

contains 40 230 households and 779 variables. The variables cover extensive socio-economic information, such as the composition of households, and household income and expenditure.

Figure 1: Overview of the Microsimulation-model



In addition, the model takes into account we use the German Socio-Economic Panel (SOEP) compiled by the German Institute for Economic Research (DIW).⁴ For the year 1993, this includes 6 637 households and 13 179 individuals.

For issues relevant to taxation, we work with a micro data set which was generated by a regional tax authority.⁵ It contains 88 460 cases and 253 variables. This income tax data includes facts relating to tax exemptions and deductions, and concerns negative incomes, in particular from renting and leasing. This is important because the sum of this kind of income is negative Whereas all other sources provide data the sums of which are usually positive.⁶ The EVS, however, is our basic data set. Information from the socio-economic panel is mainly used for time allocation of the micro units. However, the three data sets need to be merged into one integrated microdata file.

Another problem is missing data from the upper income classes in the basic data set. Our basic data set incorporates only household incomes of less than DM 35 000 per month after tax. We attempt to solve this problem by tripling all cases with an income over DM 200 000 per year. We then merge the income information from the tax authority's data set with the cases we have multiplied in the basic set, considering only the predominant income source.

The microdata file should adequately represent the German population.

(ii) The Integrated Microdata File

On the basis of these three datasets, we construct – as mentioned above – one integrated microdata file. Our first task is to transform the household units of the EVS into units of taxpayers, so that we can merge the second file, which consists of taxpayer units, with the basic data set.⁷ Capital income and rental income are not assigned to individuals; as a result these sources of income are distributed among the individuals within the household. We assume that the distribution of this category of income is identical with the per capita distribution of other sources of income. We follow the same procedure for the division of expenditure.

⁴ Information about the Socio-Economic Panel is available in Haisken-De New, J. P. and Frick, J. R. (1996).

⁵ For further information about this data set see Bork, C., Hochmuth, U. and Kleimann, R. (1998).

⁶ We can use this data set as a result of co-operation with the Institute for Economic Research (IAW).

⁷ A taxpayer can be only one person, if he or she is not married and two persons if they are married.

We are then able to merge the data from the tax authority with our basic set. We look for similarities and build clusters containing comparable micro units. Common characteristics between the various sources of data are seven income classes, seven predominant income sources, marital status and the number of children of each taxpayer. This process results in the formation of approximately 290 clusters for the income and expenditure survey and the tax data. Each case of each cluster of the basic data set is assigned a corresponding case from the second data set by accidental principle.⁸ Time allocation data from the socio-economic panel is merged in a similar fashion.⁹ The clusters relate only to taxpayers who receive wage income. They are differentiated by gender and by ten income classes. After the second merging we are able to calculate the monthly working hours for people with wage income. As a result of these mergers our integrated microdata file contains 51 537 taxpayers and 1 339 variables, representing 40 income sources¹⁰.

(iii) Weights and Updates

The distribution of personal income relevant for tax purposes is provided by the Federal Statistical Office in aggregated tables. To assess the quality of our integrated microdata file, we set out to compare the results of our simulation with these figures. The first application of our model then was to examine the results of the tax system in 1992 as compared with actual figures, using the weights employed in the EVS. The results are presented in Table 1.

⁸ We have tried this merging method several times to check simulation results. The encountered changes were negligible.

⁹ In Germany, a part of wages for work on Sundays, public holidays or work during nights are tax-free. If not taken into consideration, this fact would distort our results.

¹⁰ For income sources, see appendix.

Table 1: Results of the Income Tax Tables 1992 and Deviation from the Simulation Results Using the Weights of the Income and Expenditure Survey

Adjusted gross income from ... to ... 1 000 DM	Results of 1992 income tax tables				Cases	Deviation between the simulation and 1992 income tax tables			
	Taxpayers	Adjusted gross income	Taxable income	Tax		Tax-payers	Ad-justed gross income	Tax-able income	Tax
< 0	1 922 533	9 835	0	1	4 995	115	-212	0	-100
1 – 5	1 318 436	3 390	2 064	17	4 461	263	279	532	37
5 – 10	1 440 809	10 959	6 808	148	4 573	282	273	335	176
10 – 15	1 502 930	18 650	11 626	746	3 364	145	141	180	118
15 – 20	1 300 745	22 728	14 139	1 302	2 115	61	59	85	61
20 – 25	1 383 068	31 172	20 280	2 292	1 727	22	22	36	20
25 – 30	1 517 871	41 774	28 873	3 796	1 833	15	15	26	10
30 – 40	3 510 598	123 450	91 452	14 075	4 432	15	14	18	9
40 – 50	3 783 157	169 979	128 148	21 287	4 734	5	4	7	3
50 – 60	2 994 803	163 873	125 693	21 868	4 304	5	5	7	5
60 – 75	3 108 336	208 283	165 182	30 528	5 103	5	5	7	6
75 – 100	2 969 561	254 971	209 067	41 954	4 926	3	3	5	5
100 – 250	2 439 429	328 453	281 702	70 275	4 221	2	-1	2	1
250 – 500	206 609	68 847	62 389	23 528	595	8	8	12	15
500 – 1 000	54 677	36 687	34 083	15 033	111	-19	-20	-18	-14
1 000 – 2 000	16 398	22 120	20 770	9 694	25	-32	-36	-33	-29
2 000 – 5 000	6 592	19 511	18 488	8 762	11	-32	-37	-34	-28
5 000 – 10 000	1 524	10 391	9 900	4 603	4	-11	-2	-1	11
10 000 a. m.	751	14 997	14 344	6 450	2	4	-35	-34	-22
Total	27 556 294	1 550 236	1 245 007	276 357	51 536	59	7	10	2

Source: Statistisches Bundesamt (1997a), pp. 26 – 27; own calculations.

There is a significant divergence between the simulation results and the income tax tables for the lower income classes due to the omission of minor employment contracts in the official tax tables. The deviation in the middle and upper income classes, by contrast, is small. In order to improve our simulation results, then, we adapt the income distribution weights within the income brackets of the official tax tables. The adaptation only affects taxpayers with incomes above DM 20 000 a year. We then adjust the weighting factors to attain the correct number of taxpayers (see Table 2 for post-adjustment results).

Table 2: Simulation Results Using Corrected Weighting Factors and Deviations from the 1992 Income Tax Tables

Adjusted gross income from ... to ... 1 000 DM	Simulation results for the year 1992				Deviations to the 1992 income tax tables			
	Taxpayers	Adjusted gross income	Taxable income	Tax	Tax-payers	Ad-justed gross income	Tax-able in-come	Tax
< 0	4 128 236	-11 000	-4 490	0	115	-212	0	-100
1 – 5	4 780 883	12 855	13 038	23	263	279	532	37
5 – 10	5 498 550	40 865	29 602	409	282	273	335	176
10 – 15	3 684 753	44 880	32 502	1 627	145	141	180	118
15 – 20	2 089 559	36 229	26 107	2 093	61	59	85	61
20 – 25	1 383 065	31 148	22 704	2 335	0	0	12	2
25 – 30	1 517 874	41 810	31 615	3 828	0	0	9	1
30 – 40	3 510 613	123 000	95 472	14 032	0	0	4	0
40 – 50	3 783 153	169 000	133 000	21 711	0	-1	4	2
50 – 60	2 994 813	164 000	130 000	22 622	0	0	3	3
60 – 75	3 108 337	208 000	169 000	31 454	0	0	2	3
75 – 100	2 969 567	255 000	214 000	43 184	0	0	2	3
100 – 250	2 439 434	319 000	282 000	70 252	0	-3	0	0
250 – 500	206 609	68 846	64 684	25 148	0	0	4	7
500 – 1 000	54 677	36 691	35 089	16 264	0	0	3	8
1 000 – 2 000	16 398	21 100	20 592	10 216	0	-5	-1	5
2 000 – 5000	6 592	18 155	17 953	9 232	0	-7	-3	5
5 000 – 10 000	1 524	11 453	10 955	5 736	0	10	11	25
10 000 a. m.	751	9 394	9 175	4 827	0	-37	-36	-25
Total	42 175 388	1 600 424	1 332 997	284 995	53	3	7	3,1

Source: Statistisches Bundesamt (1997a), pp. 26 – 27; own calculations.

For taking into account changes in employment over time, we utilize the probability of becoming unemployed. According to a random number for each micro unit, we deem the increased number of unemployed people since 1993 as unemployed in the model, and then calculate their unemployment benefits.

It is also necessary to update the integrated microdata file for the years 1993-97; a straightforward procedure in relation to expenditure. We use the inflation rates for nearly 200 different commodities. For the purpose of updating the different incomes of our taxpayers, we choose various growth rates provided in the national accounts and other statistical information. In the national accounts, income from business is a residual, which might include computation errors. Hence growth rates are estimated based on another survey, the Socio-Economic Panel. The variance in income growth for different income classes was not taken into account.

(iv) Validation

For validation of the model, we compare the simulation results with actual tax revenue. An overview of actual and simulated tax and social contribution revenue is given in Table 3. The table also provides the deviations between the two.

The various reasons that account for the deviations are noted in the last column. For example, the statistics relating to both revenue and income tax distribution are published only once every three years, with a time lag of up to six years. As a result, the Federal Statistical Office (*Statistisches Bundesamt*) has only published the revenue in cash terms for 1993. Most deviations are due to the missing business sector in our model.

On the whole, our model represents a good estimate for the basic simulation year of 1993. After updating, we reach similar results for the year 1996. Our data set is now adjusted to 1997, although we do not have actual data for a comparison.

Table 3: Overview and Comparison Between Actual and Simulated Revenue of Taxes and Social Security Contributions in 1993

Categories of taxes and contributions	Revenue in cash terms 1993	Simulated revenue 1993	Representation	Reasons for the representation
	in Million DM		in %	
Wage and income tax	291 221	281 846	96.8	Restricted possibility of comparison, because the cash term's revenue also contains revenue from other periods
Church rate	17 002	17 271	101.6	
Gasoline tax	56 300	36 440	64.7	Revenue from the business sector is not included
Value added tax 7 %	..	16 526	..	Comparison not possible
Value added tax 15 %	..	116 250	..	Comparison not possible
Value added tax total	174 491	132 776	76.1	Public consumption is not included
Tax on tobacco	19 459	19 535	100.4	
Coffee tax	2 170	2 295	105.8	
Taxes on liquor, beer and sparkling wine	8 038	5 401	67.2	Alcoholic beverages sold in pubs are not included
Tax on cars	14 058	8 884	63.2	Business sector is not included
Property tax type A	592	155	26.1	Agriculture and forestry enterprises are not recorded
Property tax type B	11 071	4 878	44.1	Taxes from the business sector are not included
Insurance tax	9 290	5 703	61.4	Business sector is not included
Social contributions (only employees)	263 099	247 295	94.0	
Total	885 672	762 479	86.1	

Source: Statistisches Bundesamt (1994), pp. 482, 536, 104 f.; Institut der Deutschen Wirtschaft (1997), Table 78; own calculations.

(v) Possibilities and Limitations

The large number of cases in the integrated microdata file allows for the analysis of sub-populations, which is not possible with other data sets. Furthermore, we have included almost all important taxes and transfers - something unique at this time for the German tax system. As a result, we can examine all taxes simultaneously.

We intend to extend our model according to the linear expenditure system as developed by Stone and Llach¹¹, and we will estimate elasticities from our cross-section data. This allows

¹¹ See Stone R. (1954) and Llach, C. (1973).

us to examine the adjustments of taxpayers that result as a consequence of commodity price changes. Work on this part of the model is currently in progress. Another possible extension of the model will account for labour supply, but a lot of work remains to be done before this section will be implemented. In addition, we can extend our model to the distribution of property ownership including (public and private) pension entitlements.

After highlighting its possibilities, we should also refer to the limitations of the model. A critical remark must be made on the issue of profits. Taxpayers have to calculate their profits before they complete the tax forms for their local fiscal authority. Consequently, our data does not encompass the methods of profit calculation. When calculating profit, there are numerous tax exemptions and deductions. This problem applies to income from enterprises and self-employment, as well as from rental income. This problem could be solved by integrating data from tax audits, but such data is hard to obtain in Germany.

Another problem is the missing panel feature, which allows changes in individual taxpayers' behaviour to be taken into account. Our population is merely updated with a method of static ageing. Therefore no longitudinal analysis is currently possible.

C. The Tax Reform Proposals

Tax reform is a topic which has long been the subject of discussion in Germany. The last government tried to reform income tax, but without success, as a result of the fact that the majority in the second chamber (*Bundesrat*) blocked the reform. However, since the election last year the new government has a clear majority for reforming tax policy, which is a central element of their agenda.

Nevertheless, we do not want to discuss the reforms in detail, we just want to demonstrate the consequences of changes in tax legislation. The reform include changes in income tax law¹² and other taxes, an undertaking which the government has called the “start of environmental taxation” (“*Einführung der Öko-Steuer*”).¹³ This includes an increase in gasoline tax and the introduction of a new tax on electricity. Our analysis only covers the consequences of the new tax policy for private households. Parts of the reform were implemented on January 1, 1999. Other parts will be introduced between April 1999 and January 2002. Due to the number of

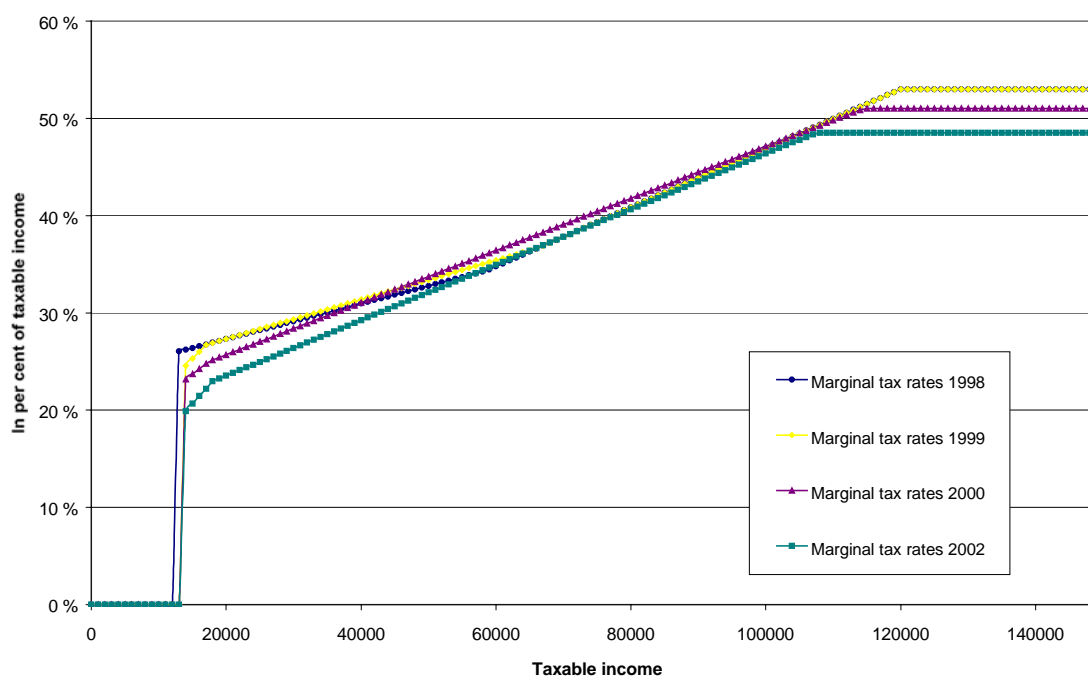
¹² Further details are provided by the government in Bundestagsdrucksache 14/23.

¹³ For details of this part of the reform see Bundestagsdrucksache 14/40.

uncertainties, we have chosen not to update the data set, assuming instead that all parts of the reform take place simultaneously.

We simulate income tax, the removal of tax deductions for school fees, agriculture and forestry exemptions, and the 50 per cent cut in the saving exemption (for interest payments) in detail. Other factors taken into account are changes in the treatment of redundancy payments, limitations in relation to income-splitting for married couples, and restrictions on balancing negative against positive incomes. In addition we simulate the new tax schedules. Figure 2 illustrates intended marginal tax rates compared with current ones.

Figure 2: Marginal Tax Rates for 1998, 1999, 2000 and 2002



Source: own calculations.

Changes to indirect taxes include increases to gasoline tax for petrol, diesel, heating oil and gas, as well as the already mentioned introduction of an electricity tax. An increase in child benefits is also simulated. Finally, decreasing social security contributions are included.¹⁴ Additionally, the government plans a further rise in indirect tax rates, especially in relation to environmental taxes in the next few years, but tax schedules are currently only defined for 1999.

¹⁴ Decreasing social security contributions should be balanced with increasing indirect tax revenue.

D. Revenue and Distributional Effects

First of all, we have to mention that our model is able to aggregate the results in different ways. We have decided to aggregate our sample in three categories using income classes as the break variable. The first aggregation takes all cases together, the second takes unmarried cases, and the last, married taxpayers. For the income classes, we take gross income as a base.

Table 4: Simulation Results in 1998: Before the Reform

Gross income from ... to ... 1 000 DM	N unweighted	N weighted	Gross income	Direct taxes	Indirect taxes	Social security con- tributions
			in million DM			
0 – 5	4 219	2 655 105	2 597	0	835	212
5 – 10	1 515	1 311 065	10 046	0	1 729	869
10 – 15	1 902	2 190 167	27 848	1	4 265	2 224
15 – 20	1 932	2 266 159	39 405	163	5 374	3 422
20 – 25	1 920	2 257 311	50 779	649	6 417	4 518
25 – 30	1 935	2 392 130	65 732	1 496	7 327	6 092
30 – 35	2 131	2 532 484	82 281	2 562	9 000	8 166
35 - 40	2 422	2 778 021	104 309	4 534	10 517	10 566
40 - 50	5 176	5 486 052	246 924	14 403	24 160	27 328
50 - 60	4 952	4 530 238	248 172	19 780	23 312	32 100
60 - 70	4 436	3 572 349	231 285	21 883	21 253	32 524
70 - 80	3 828	2 661 144	199 051	21 440	17 792	27 730
80 - 90	3 227	2 033 129	172 342	21 221	14 497	24 074
90 - 100	2 572	1 568 190	148 708	20 062	12 047	20 668
100 - 110	1 982	1 204 173	126 161	18 225	10 110	17 292
110 - 125	2 095	1 300 327	152 190	23 674	11 454	20 430
125 - 150	2 043	1 281 356	174 460	30 224	12 665	21 711
150 - 200	1 715	1 039 398	176 004	35 124	11 591	17 588
200 - 500	1 298	543 684	156 981	42 301	7 425	8 322
500 - a. m.	236	109 760	127 556	54 873	1 629	1 341
Total	51 536	43 712 244	2 542 831	332 616	213 401	287 178

Source: own calculations.

For an analysis of revenue and distributional effects, the first step is to simulate the current, pre-reform system. These results will be used as a reference point. Table 4 illustrates the simulation results before the tax reform. The table also shows the unweighted number of cases in each income class. Each class has a sufficient number of cases to represent the whole population quite well, while the sampling error is acceptably small.

The impact of the reform proposals with regard to tax revenue is shown in Table 5. For direct taxes (income tax and the related church tax),¹⁵ we have a decreasing revenue amount of DM 8.365 billion in 1999, the first reform year.

Table 5: Revenue Changes against the Reference Point in 1999, 2000 and 2002

Gross income from ... to ... 1 000 DM	Impact in 1999				Impact in 2000		Impact in 2002	
	Direct taxes	Indirect taxes	Social security con- tributions	Dis- posable income	Direct taxes	Dis- posable income	Direct taxes	Dis- posable income
	in million DM							
0 - 5	0	11	-1	0	0	0	0	0
5 - 10	0	46	-10	3	0	3	0	3
10 - 15	-1	133	-25	14	-1	14	-1	14
15 - 20	-59	179	-33	64	-82	88	-111	119
20 - 25	-129	220	-39	121	-200	195	-298	298
25 - 30	-178	260	-62	158	-310	296	-495	490
30 - 35	-207	311	-92	191	-399	393	-676	684
35 - 40	-275	362	-131	258	-561	559	-1 006	1 027
40 - 50	-797	809	-399	922	-1 579	1 750	-2 936	3 186
50 - 60	-1 070	796	-544	1 548	-2 006	2 536	-3 865	4 500
60 - 70	-1 177	719	-592	1 872	-2 128	2 877	-4 189	5 056
70 - 80	-1 043	586	-521	1 691	-1 944	2 644	-3 920	4 736
80 - 90	-834	478	-468	1 406	-1 665	2 288	-3 521	4 257
90 - 100	-661	395	-415	1 134	-1 391	1 910	-3 069	3 694
100 - 110	-495	335	-353	865	-1 082	1 490	-2 550	3 056
110 - 125	-463	371	-423	897	-1 074	1 548	-2 878	3 471
125 - 150	-337	399	-462	750	-887	1 336	-3 021	3 618
150 - 200	-147	348	-391	499	-252	609	-2 386	2 890
200 - 500	233	200	-199	246	168	303	-1 514	2 153
500 - a. m.	-724	43	-35	784	-2 524	2 718	-3 905	4 305
Total	-8 365	7 002	-5 195	13 420	-17 916	23 555	-40 341	47 557

Source: own estimates.

Our findings suggest that average tax revenue is decreasing for almost every income class, except for taxpayers with a gross yearly income of between DM 200 000 and DM 500 000 DM. These people will have to pay an additional DM 233 million, although this may not be immediately feasible because of the choice between the receipt of child benefits or a child tax exemption. The tax authority calculates income tax rates considering these two options and uses the option which is more favourable for the taxpayer. Because of increased child benefits for taxpayers in this income bracket, such benefits are the superior option after the reform.

Compared to income tax revenue within each income bracket, the revenue arising from indirect taxes is distributed more or less equally over the whole incomescale. Advantages

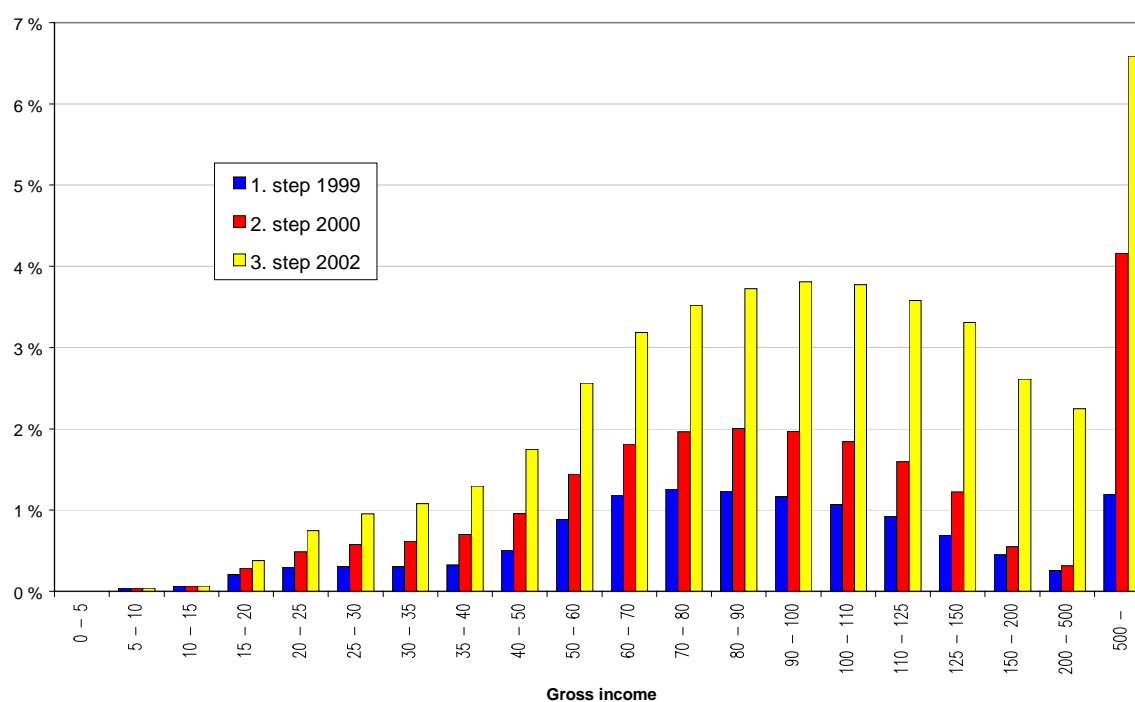
¹⁵ The church tax is directly tied to the individual income tax burden (generally 9 % of the income tax burden).

arising from a reduction in social security contributions mostly favour the middle and upper income classes. With regard to disposable income, on average all income classes can expect a higher disposable income. The second step of the reform results in relief of about DM 18 billion in direct taxes, and for the last step in 2002, relief of DM 40 billion is forecast.

A proper analysis of the distributional effects of the reforms requires an examination of the significant increase in child benefits and its effect on disposable income. In this respect, all changes introduced by the reform are summarized in one variable.

Figure 3 provides the results of the modifications created by the three reform steps, where each step has similar effects. In the lower income brackets only a marginal increase of disposable income can be observed.

Figure 3: Effects on Disposable Income in the Three Reform Stages – Overall Population (in Per cent of Disposable Income) in 1999, 2000 and 2002



Source: own calculations.

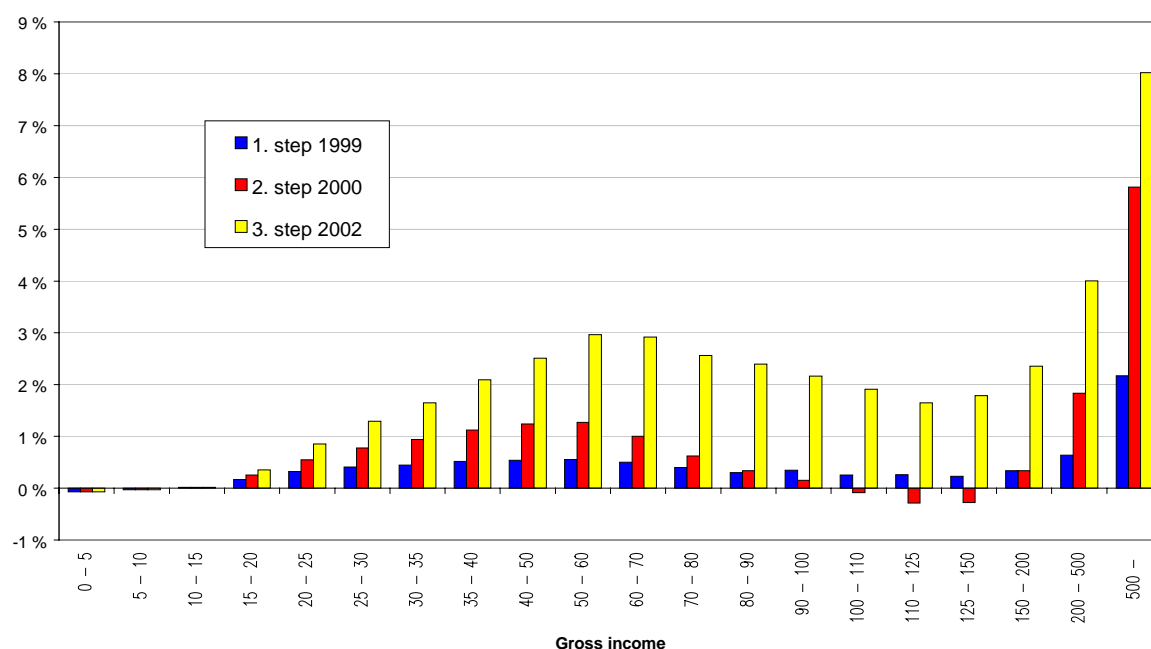
With expanding gross income, the disposable income after the reform rises. The first step has smaller effects than the second, while the impact of the second reform step is smaller than the third.

If we take unmarried taxpayers instead of the whole population, the picture will be different, as depicted in Figure 4. Because of the increases in indirect taxes, the taxpayers in the lowest income classes are burdened by a reduced disposable income for all reform steps. In the

second step, where the existing saving exemption is halved, and a new tax schedule is planned, there is a decrease of disposable income for unmarried taxpayers with an gross income of DM 100 000-150 000. Obviously, these taxpayers profit considerably from the current saving exemption which would be decreased in the second step. In the third step, these same taxpayers will be compensated by further reductions in the marginal tax rates.

In the last reform step, unmarried taxpayers in the DM 0-20 000 and DM 60 000-200 000 income brackets profit less than the average taxpayer in the general population with the same salary classifications.

Figure 4: Effects on Disposable Income in the Three Reform Stages - Unmarried Population (in Per cent of Disposable Income) in 1999, 2000 and 2002

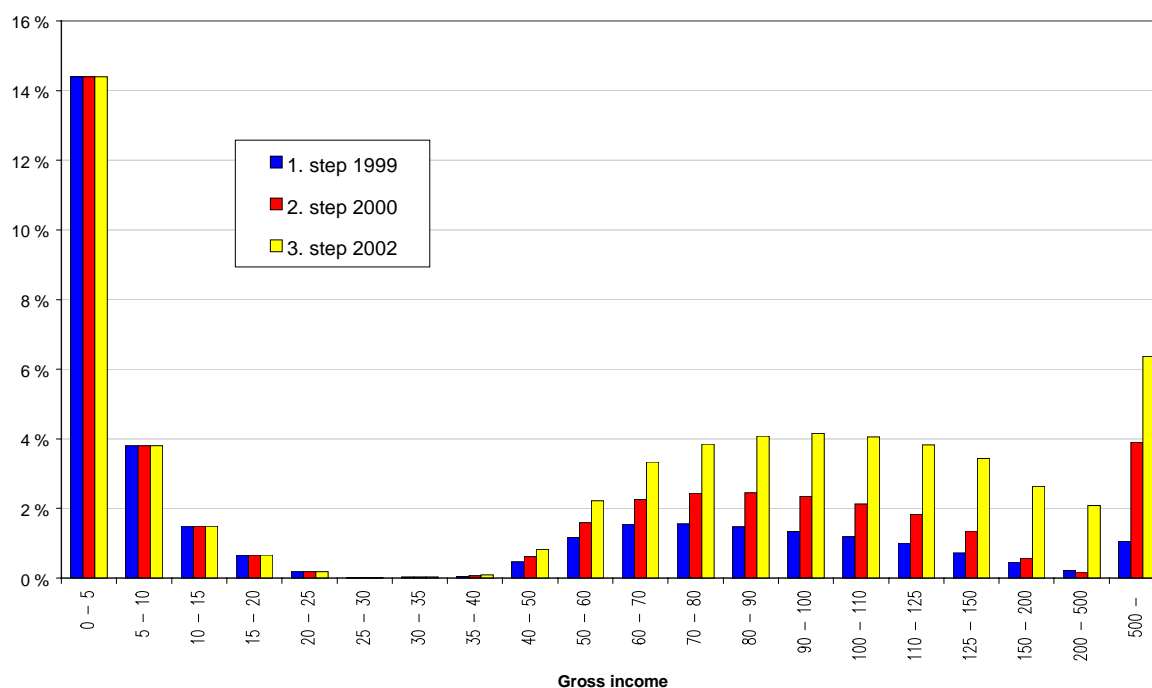


Source: own calculations.

Examining the married taxpayers as represented in Figure 5, the largest advantages can be found in the lowest income brackets, decreasing as gross income increases. This rise is constant in all reform steps, it is a result of increased child benefits, which will raise disposable income.

For gross income from DM 25 000- 40 000, married taxpayers barely profit from the whole reform. In the upper income brackets, the limitation of the splitting advantage for married taxpayers leads to lower tax relief as compared with unmarried taxpayers, in spite of the fact that the marginal tax rate is the same at 48.5 per cent.

Figure 5: Effects on Disposable Income in the Three Reform Stages - Married Population
(in Per cent of Disposable Income) in 1999, 2000 and 2002



Source: own calculations.

Summarising the results, it becomes obvious that almost the whole population benefits from the reform, with only some single taxpayers losing out. The average maximum loss is DM 225 for unmarried taxpayers with a gross income of DM 125 000 - 150 000 in the second step. The weighted average gain in disposable income for all taxpayers in the first step is 0.6 per cent. In the second step it is 1.0 per cent and in the third 1.9 per cent.

E. Conclusion

When reforming the tax and transfer system, it is important to study the distributional and revenue effects that such a proposal may have. Both politicians and taxpayers have an interest in the impact of such reforms. In Germany, only the revenue effects are calculated by the Ministry of Finance. The leading German research institutes, however, do not have a microsimulation-model to investigate distributional effects. Only the Federal Ministry of Finance together with the Society for Mathematics and Data Processing (*Gesellschaft für Mathematik und Datenverarbeitung*, GMD) has such a model, but their results are not published. Our simulation model is a suitable instrument for analysing the first-order impacts of reform proposals. In the near future we plan to expand our model and will analyse second-

order effects. In addition, labour supply effects of changes in the tax and transfer system will be integrated. Then even behavioural adaptations can be analysed in a mid-term perspective. While we are satisfied with the results our model has yielded so far, much work remains to be done before all questions of interest will have been answered.

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Appendix: Sources of gross income

1. Income from agriculture and forestry
2. Income from business
3. Income from self-employment
4. Income from employment
5. Income from capital assets
6. Income from renting and leasing
7. Redundancy payments, layoff benefits, tide-over allowance
8. Premium payments, share in profits, rewards
9. Old-age pensions from the statutory pension insurance from own employment
10. Widow and widower pensions from the statutory pension insurance
11. Orphans' pensions from the statutory pension insurance
12. Old-age pensions from supplementary insurance of public employees and workers from own employment
13. Widow and widower pensions from supplementary insurance
14. Orphans' pensions from supplementary insurance
15. Injury pensions from statutory accident insurance
16. Widow and widower pensions from statutory accident insurance
17. Orphans' pensions from statutory accident insurance
18. Sickness benefits from statutory health insurance
19. Unemployment benefits
20. Short-time workers payments, bad weather payments
21. Other permanent transfer payments from public employment programmes
22. Maternity benefits
23. Social aid
24. Child care benefits/grants from the Federal Education Act
25. Permanent transfers from the Federal Training Assistance Act (*Bafög*)
26. Disability pension from the war victims welfare service
27. Survivors' pension from the war victims welfare service
28. Other permanent transfers from the regional authority
29. Unemployment aid
30. Early retirement payments, old age transition payments
31. Public pensions and pensions from public enterprises from own employment as civil servants
32. Public pensions and pensions from public enterprises for widows and widowers
33. Public pensions and pensions from public enterprises for orphans
34. Company pensions from own employment
35. Company pensions from other claims
36. Permanent transfers from private health, damage and accident insurance
37. Strike support payments (from unions to their members)
38. Other permanent transfers from non-profit organisations (churches, labour unions)
39. Other permanent transfers from private households
40. Child benefits

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