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Professions, entrepreneurs, employees and the new German tax (cut) reform 2000 - A MICSIM microsimulation analysis of distributional impacts

Joachim Merz, Henning Stolz and Markus Zwick

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Summary

With the tax reform 2000 Germany has seen the implementation of the most ambitious tax reduction programme in its post-war history. In the period from 1998 to 2005, taxpayers will benefit substantially from net tax relief more than DM 100 billions in total. It is expected, that private consumption and investment are stimulated - two essential requirements for promoting growth and employment.

Under the aspect of the tax reform 2000 and the 'Karlsruher Entwurf' (an expert draft on further income tax reform approaches) compared to the former taxbase system we investigate in our paper overall and distributional and redistributive impacts on the self employed (professions (free lancers) and entrepreneurs) and employees besides other socioeconomic grouping like gender and family type. In addition, a decomposition analysis based on a generalized entropy approach quantifies the socioeconomic subgroups' inequality contribution to overall inequality.

Together with the recent poverty and wealth report for our government, this is the first time that the anonymized microdata records of the German Income Tax Statistic can be used by researchers within the Federal Statistical Office. Such a microdata file is essential for analysing above all the often neglected situation of the self-employed; in traditional surveys, where, in principle, firm information yielding the final income and taxes to be paid are not available for the self-employed.

JEL: D30, D31, J23

Keywords: microsimulation, German tax reform, Karlsruhe proposal, self-employed, professions, entrepreneurs, employees, distributional and redistributive policy impacts, inequality and decomposition of inequality

Zusammenfassung

Mit der Steuerreform 2000 wurde das ambitionierteste Steuerreduktionsvorhaben in der deutschen Nachkriegsgeschichte beschlossen. In den Jahren von 1998 bis 2005 werden Steuerzahler von einer Nettoentlastung von insgesamt mehr als 100 Mrd. DM profitieren. Man erwartet hierdurch eine Stimulation der privaten Ausgaben sowie der Investitionen, zwei wichtige Voraussetzungen für Wirtschaftswachstum und mehr Beschäftigung.

Auf der Grundlage von Vergleichen zwischen dem früheren Steuersystem mit der Steuerreform von 2000 und dem Karlsruher Entwurf (einem Vorschlag einer Expertengruppe für weitere Einkommenssteuerreformen) werden in diesem Paper Verteilungs- und Umverteilungseffekte auf die Gruppe der Selbständigen (Freie Berufe und Unternehmer) und anderen sozioökonomischen Gruppen (z.B. unterschieden nach Geschlecht, Familientypus etc.) untersucht. Zusätzlich wird die Ungleichverteilung einzelner sozioökonomischer Untergruppen im Vergleich zur gesamten Ungleichheit mit Hilfe einer Dekompositionsanalyse auf der Basis der Informationstheorie untersucht.

Neben dem kürzlich erschienenen Armuts- und Reichtumsbericht der Bundesregierung ist dies das erste Mal, dass anonymisierte Mikrodatenfiles der deutschen Einkommenssteuerstatistik der Wissenschaft innerhalb des Statistischen Bundesamtes zur Verfügung gestellt werden. Solche Mikrodaten sind jedoch für die Analyse der oft vernachlässigten Selbständigen unerlässlich; über konventionellen Umfragen sind präzise Daten über das Einkommen und die Steuerlast der Selbständigen praktisch nicht zu erheben.

JEL: D30, D31, J23

Schlagwörter: Mikrosimulation, Einkommenssteuerreform, Karlsruher Entwurf, Selbständige, Freie Berufe, Unternehmer, Angestellte, Verteilungs- und Umverteilungseffekte, Ungleichheit und Dekomposition von Ungleichheit

Professions, entrepreneurs, employees and the new German tax (cut) reform 2000 - A MICSIM microsimulation analysis of distributional impacts

Joachim Merz, Henning Stolze and Markus Zwick¹

1	Introduction	4
2	Microsimulation of the Tax Reform: Principle Procedure of our Microanalyses	6
2.1	Our Microsimulation Steps	7
2.2	Adjustment of the 1995 Income Tax File to 2000/2005, Economic Multipliers and Static Aging	7
3	MICSIM: A Microsimulation Model	8
4	Microdatabase: The 10% Sample of the Wage and Income Tax Statistic 1995	8
5	concept of an ‘economic’ market income as a unified initial ‘gross’ income	9
6	The new German tax reform alternatives under investigation	10
6.1	Baseline: the income tax law of 1995	10
6.2	Tax reform 2000: The final income tax situation in the year 2005 after the tax reform 2000	12
6.3	The “Karlsruhe proposal”	14
7	General Results	17
7.1	General results: Overall size of the tax reform alternatives	17
7.2	General results: Distributional and redistributive impacts of the tax reform alternatives	18
8	Results for socioeconomic group	25
8.1	Defining socioeconomic groups	26
8.2	Tax burden impacts of tax reform alternatives for socioeconomic groups	28
8.3	Disposable income impacts of the tax reform alternatives for socioeconomic groups	36
8.4	Distributional impacts of the tax reform alternatives for socioeconomic groups	41

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We thank the discussants of the Microsimulation Session (organized by Joachim Merz and Holly Sutherland) of the 27th General Conference of The International Association for Research in Income and Wealth,

8.5	Decomposition of inequality: The contribution of subgroups to overall inequality - Impacts of the tax reform alternatives	56
8.6	Redistributional impacts of the tax reform alternatives for socioeconomic groups	64
9	Conclusions	70
	References	73
	Appendix 1: The German Income Statistic 1995 Definitions	75
	Appendix 2: Model for Sunday-, public holiday- and night work extra pay	77
	Appendix 3: DISTRIBUTIONAL MEASURES	79
	Appendix 4: Numerical Results	82
	Publication list	94

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1 Introduction

Beyond traditional taxation aims to cover public expenditures and to promote a just income distribution (based on the principle of productive ability ('Leistungsfähigkeit')), during the last two decades another aspect of taxation has been established. Promoted by the discussion of supply side orientated policies of the Reagan and Thatcher era and theoretically based on the so called Laffer-Theorem (Canto, Douglas and Laffer 1983), the questions about the individual impacts and incentives/disincentives of taxes and benefits became increasingly important in the political discussion. Questions discussed were impacts on the individual labour supply, labour market effects through companies and entrepreneurs, and the connected competitiveness of Germany as location for (new) businesses. These questions were embedded in the general discussion about non-market and market economies and the equality/inequality of income as a source of economic growth and well-being. In Germany this mindset resulted in the tax reform 2000 of the new red-green coalition government with estimated overall tax cuts of about 56 billion Euro (= 110 billion DM).

However, before incentive/disincentive impacts of a tax/transfer system can be investigated, so-called first-round effects, the immediate, direct effects of tax cuts (say) of an alternative system to the taxpayers (factual incidence) have to be calculated. Embedded in the above general questions, then the distributional impacts, the winners and losers of a changing system is of central interest for both of them: for a government with regard to their goals of relief and burden, and for the individual tax payers with regard to their concerned income and (economic) well-being. This study will contribute to this task and will analyse the

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distributional and redistributive impacts on the individual taxpayers of the new German tax reform and discussed alternatives.

Together with administrative new tax regulations the scientific and policy discussion (again) stress the importance of a more transparent and effective tax system. One important attempt in Germany is the so called “Karlsruher Entwurf” (“Karlsruhe proposal”) which was initiated by former federal constitutional court judge Paul Kirchhof and leading tax system academics and experts in 2001 (Karlsruher Arbeitskreis 2001). The gist of the approach is that a drastic simplification of the very complex German tax system will result in greater transparency and will thus increase the acceptance of the taxation laws by the public. This should mobilise the economic impetus while at the same time keeping tax income of the government constant (‘Aufkommensneutralität’).

The government tax reform as well as the Karlsruhe proposal try to reach their goals by a variation of the tax rate and at the same time increasing the taxable base (‘Bemessungsgrundlage’). Both these elements finally determine the total tax liability of the tax units. According to the way they are designed they affect the total population of tax payers in different ways. How they - under the different proposals - influence the final tax payments and the affected incomes is the central question of our paper.

In this study we analyse and quantify by a microsimulation approach the distributional and redistributive impacts of the tax situation before the tax reform 2000 (baseline simulation) the tax reform 2000 itself with its several parts up to 2005 and the mentioned ‘Karlsruher’ proposal for various groups of persons that are liable for taxation. Besides other socio-economic breakdowns, in particular we will focus on the situation of the self-employed, as professions (free-lancer, liberal professions, ‘Freie Berufe’) and entrepreneurs, and the employees. We focus on these groups not only because they are important group in the economy and the society as a whole, but also because they are respectively targeted by the tax reform under investigation.

Besides the fiscal aim to cover government spending it has been an aim of the German taxation policy to change the income distribution resulting out of the market forces to a socially juster distribution through the tax system (SPD 1998, CDU 1994) by redistribution via the tax and benefit system. As mentioned, we will thus analyse the distributional situation before and after tax and we will quantify the respective redistributive effects.

Though there are some recent analyses of the German Tax Reform 2000, however, either they are restricted to company effects (Börstinghaus and Weinelt 2002) and/or – compared to our possibility with regard to detailed tax information - to a constrained database, the German Socio-Economic Panel (Wagenhals 2001). A thorough database is especially needed for the tax impact microanalysis among others for self-employed income with all their final company’s deductions etc. to achieve the ‘real’ income situation (see Merz 2000a, 2001). Furthermore, one has to be able to take into account and map the many special rules and

exceptions provided for in the tax law for each individual. For the first time in Germany we are able to work with such a comprehensive and well-suited micro database: the anonymised individual records of the German Income Tax Statistic as a 10% sample of the currently available income tax statistic 1995 with ca. 3 million records.

Paper organization

In section 2 we describe the principle procedure of our microsimulation tax reform analysis. Section 3 gives a comprehensive description of MICSIM, the microsimulation model we developed and use in our study. Section 4 is about the microdatabase, the 10% sample of the Wage and Income Tax Statistic 1995. Section 5 develops the concept of an ‘economic’ market income as a unified initial ‘gross’ income. All the tax systems are compared to each other regarding their distributional impacts. Section 6 is describing the new German tax reform alternatives: the baseline is the income tax law 1995 situation, the actual tax reform 2000/2005 and the “Karlsruhe proposal”. Section 7 presents general results according to the overall size of the tax reform and the overall distributional and redistributive impacts of the tax reform alternatives. Section 8 is about the results for socio-economic groups: after defining these groups we respectively investigate tax burden and disposable income impacts, distributional effects, the decomposition of inequality and redistributive impacts. The paper ends with the concluding remarks in section 9.

2 Microsimulation of the Tax Reform: Principle Procedure of our Microanalyses

It has been proven by many analyses, microsimulation is a qualified and in particular well-suited instrument to analyse policy impacts on an individual level. Above all, distributional effects, winners and losers, based on a representative sample by this instrument are able to be quantified without all the restrictions of typical cases only. Since the seminal work of Orcutt (1957), over the decades a growing number of microsimulation models and analyses of tax and benefit impacts in many countries worldwide have shown the success and possibilities of static and dynamic cross-section and life-cycle microsimulation. A general description of the microsimulation approach is found e.g. in Merz 1991, international approaches and developments are provided by Orcutt, Caldwell and Wertheimer II 1976, Orcutt, Merz and Quinke 1986, Atkinson and Sutherland 1988, Brunner and Petersen 1990, Citro and Hanushek 1991a,b, Hancock and Harding 1996 and recently by Gupta and Kapur 2000 and Mitton, Sutherland and Weeks 2000.

2.1 Our Microsimulation Steps

We analyse the distributional and redistributive effect that the alternative tax regulation scenarios will have. Because the total tax due is determined both by the taxable base ('Bemessungsgrundlage') and the tax rate, the first step is to design an unified gross income definition for all of the different proposals. In addition, what is needed is an "economic" income term that defines market income from an economic perspective and not on a tax statistic based view.

Therefore, in the first microsimulation step we derive an 'economic' market income from the available tax statistic data (chapter 3). This market income then becomes a (gross) reference term for the further simulation of the tax burden. In the following steps the resulting individual tax burden of the baseline year 1995, the individual tax burdens for the year 2005 (in which the final stage of the tax reform 2000 is achieved), as well as the individual tax burden which would result by implementing the "Karlsruhe proposal" have to be ascertained through the microsimulation calculations for all of the individual 3 million data records of our Income Tax sample.

From the market income the tax is deducted according to the relevant laws applicable for the individual. The market income minus the taxes is further called the net income as the disposable income, which is in the centre of our structural and distributional analyses. The individual difference between the market income and the disposable income of the alternatives quantify the respective redistributive impacts.

2.2 Adjustment of the 1995 Income Tax File to 2000/2005, Economic Multipliers and Static Aging

An extrapolation of the monetary values (inflating by economic multipliers) out of the 1995 Income Tax sample to the year 2005, the year of the final stage of the new German tax reform was not done. Inflating the base line (1995 situation), the new tax reform 2000/2005 and the "Karlsruhe proposal" (with unknown future price inflators, in addition) would bias the results away from the original introduction and discussion of the alternatives. However, since the family/tax unit situation with children, for instance, are treated in different ways within the alternatives, a changing demographic situation may alter the results. We are working on this topic, methodologically based on the computer program package ADJUST (Merz, Stolze and Imme 2001) and shall add these results in the next version of this paper.

3 MICSIM: A Microsimulation Model

As the methodical instrument we use MICSIM, a user friendly and powerful microsimulation tool (Merz 1996). Briefly speaking, the MICSIM basic concept above all is *1. concentration*

on the substantial demands only, 2. operation by a protected data base management, 3. efficient operation by a set-theoretical based approach, and 4. user-friendly interactive environment. This concept is realized within a windows by a C++ environment arranging the user friendly interface and translating all data transformations to SQL to operate finally on a relational database system.

The substantial microsimulation domains and modules for MICSIM are: **1. Simulation of Alternative Policies, 2. Adjustment and Aging of Microdata, 3. Evaluation of Simulation Runs, and 4. Additional Tools.** Each module allows specific work independently of other modules and is available as a stand-alone version. For instance, ADJUST is a powerful windows C-package to adjust (reweight) any microdata set to achieve representative results (Merz 1994, Merz, Stolze and Imme 2001, <http://ffb.uni-lueneburg.de/adjust>).

In particular, when analysing distributional impacts we developed DISTRI/MICSIM (Merz and Plönnigs 1997), another stand-alone windows-package to provide distributional measures. Since all of our data work had to be done within the Federal Statistical Office in Wiesbaden, we had to provide a program package written in SPSS-code. This is now also a stand-alone MICSIM application for distributional analyses and for analysing a decomposition of inequality to groups of interest (Merz 2000b) and was used finally for our microsimulation analysis.

4 Microdatabase: The 10% Sample of the Wage and Income Tax Statistic 1995

The German Wage and Income Tax Statistic is a population wide statistic with wages and income tax (Lohn- und Einkommensteuer) information of overall ca. 30 mio. tax units. In the case of joint assessment of couples one tax unit represents two taxed persons. Accordingly the wage and income tax statistic 1995 describes the formation and origin of the taxable income for nearly 38 million taxable citizens. Each data set describes with a maximum of 450 characteristics all the items from the sum of all income (Summe der Einkünfte) via the taxable income (Zu versteuerndes Einkommen), the tax amount up to the final fixed income tax (festgesetzte Einkommensteuer) to be paid (Appendix A1). The characteristics are statistically recorded within the framework of the annual tax declaration.

For the further analysis and especially for the calculation-intensive simulation, a 10% sample was drawn out of the total. The sample is constructed as a stratified random sample (Zwick 2001, Merz and Zwick 2001) to meet the requirements of high accuracy according items and socio-demographic breakdowns. Altogether five stratifying characteristics were incorporated: old/new federal states (Bundesländer) (2), assessment type (Veranlagungsart) (4), levels of tax exemption for dependent children (Kinderfreibetragschritte) (4), primary income (“Einkunftsart”) (7), sum of all income (“Gesamtbetrag der Einkünfte”) (12).

The total combination of these characteristics result in 2688 strata. Because some of these strata were only marginally occupied or empty, finally 1568 strata were considered. For our paper the 10% sample as formal anonymised data material was processed with SPSS.

5 The concept of an ‘economic’ market income as a unified initial ‘gross’ income

For our economic analysis of income and its distribution we need an income concept that is based rather on economic requirements than tax requirements as it is provided by our income tax statistic. Required is an income concept that characterises, as a primary market income, an effective (pre government) income reconsidering opportunities through various depreciating possibilities, in particular for high income brackets. In particular we take into consideration miscellaneous depreciation, realisation profits (=Veräußerungsgewinne) and variants in the area of earnings derived from letting and leasing – areas of the tax law that are of high interest and of substantial value to high income groups.

Calculating the individual market income from the income tax information³ some income components that became relevant in further simulation steps could not be taken directly from the data set. This was the case for the trade tax (“Gewerbsteuer”) as well as for the 1995 tax free premiums for night-, Sunday- and holiday work.

The assessment basis of the **trade tax** (“Gewerbsteuer”) is the profit of business enterprise plus appreciation and minus depreciation applicable to entrepreneurs (in Germany, professions (free-lancers) are not applicable for a trade tax.).⁴ If the trade tax would be abolished the income of the business enterprises would rise accordingly. A market income concept should thus take this income component into account. The trade tax payable is the product of the tax measurement amount (“Steuermessbetrag”) with the local trade tax rate. Out of the individually calculated tax measurement amount - by multiplying with the weighted average trade tax rate for every federal state – we estimated the individual trade tax which then will be a part of the generated new market income.

The **tax free premiums for night-, Sunday- and holiday work** were estimated with the help of the micro census 2000 as well as the state subsidy report 2002 (“Subventionsbericht”) of the federal government. The tax advantage of 1.9 billion € mentioned in the subsidy report was allotted to the employees via a distributional model. By taking into account their individual average tax rates these tax advantages were transformed into income components (Appendix A2) and were then respected individually within the generated new market income.

³ For details see Merz 2001 and Bach and Bartholmai 2000

⁴ Detailed information about appreciation and depreciation is not available. The current trade tax statistic shows that the appreciation and depreciation balance themselves over all the taxable individuals.

6 The new German tax reform alternatives under investigation

The baseline of our microsimulation analyses is the income tax law of 1995. As mentioned, we shall analyse the distributional impacts of two tax reform alternatives: The tax reform 2000 with its final income tax situation in the year 2005 after the tax reform 2000 with several steps, and the “Karlsruhe proposal”. The starting situation and the alternatives are briefly characterised in the following.

6.1 Baseline: the income tax law of 1995

The Income Tax Statistic and our sample display for every tax payer the total tax due for 1995 as one variable. This variable in its current form can not be directly used for the distributional analysis. In order to compare the 1995 situation to the various different tax reform alternatives the total tax due for 1995 also had to be recalculated. The differences of the tax reform alternatives in particular were very distinct regarding the child allowances, the trade tax and the reunification tax surcharge. In 1995, for instance, one could receive a child allowance *and* also be eligible for a child tax exemption amount, in 2005 a tax unit could choose between a child allowance *or* a child tax exemption amount, and the Karlsruhe concept proposes a basic tax exemption amount and an additional child allowance up to a certain income level. These differences were taken into account, amongst other thing, by recalculating a total tax due for 1995.

Child allowance: In 1995 every tax payer with children received, apart from the child allowance, also a child tax exemption amount of 2 098 € per child. From the tax year 1996 on the child tax exemption amount ceased to exist and was compensated by a higher child allowance⁵ and a higher basic tax exemption amount.

Because the total tax amount due according to the tax reform 2000 as well as in the “Karlsruhe proposal” is in various ways dependent on the number of children, all the taxation effects out of the tax liability for all alternatives have been deliberately omitted. In a separate module we thus calculated the income effect caused by the number of children for all the three taxpayer groups. In the calculation for the total tax amount for 1995 we adjusted the assessment basis of the tax rate of the taxpayers by the child tax exemption amount. Out of this “modified taxable income” we calculated the total tax due for 1995 with the help of the (inverse) tax rate function (“Steuertariffunktion”).

Trade tax: In a further step this tax liability was expanded for taxpayers with trade earnings to include the trade tax burden. This was necessary because the tax burden reduces the market

⁵ Taxpayers who were better off with the child tax-exemption amount compared to the new child allowance amount could still use the child tax-exemption amount.

income as defined above. Because the market income includes the trade tax but the “Karlsruhe proposal” doesn’t, we had to use the tax burden in 1995 to ensure comparability.

Reunification tax surcharge: Furthermore the tax amount payable for the year 1995 was increased by the reunification tax surcharge of 7.5% on the fixed income tax (“festgesetzte Einkommensteuer”).

Beyond these modifications for our comparisons the key elements of the Income Tax Law 1995 are sketched in Table 1.

Table 1: Income Tax Law 1995: Key elements
<ul style="list-style-type: none"> ▪ basic tax-exemption amount: 2 871 € ⇒ taxation on parts of the minimum living wage ▪ top income tax rate at 53% ▪ reunification tax surcharge of 7.5% on the fixed income tax ▪ tariff limit (“Tarifbegrenzung”) for trade income ⇒ top income tax rate for trade income at 47% ▪ half tax rate for exceptional earnings especially for realised capital gains (from the sale of the asset) ▪ nearly unrestricted equalisation possible between the various earnings types (horizontal loss compensation) ▪ loss deduction of 5 112 919 € (10 000 000 DM) possible for the two previous tax assessment years ▪ Reduction for lower income § 32 d EStG 1995 ▪ Reduction in the case of inheritance tax burden

6.2 Tax reform 2000: The final income tax situation in the year 2005 after the tax reform 2000

The laws regarding income tax were changed by various new laws and amendments in quick succession due to the change of government in 1998. Following the “tax relief law” (“Steuerentlastungsgesetz”) 1999/2000/2002 of the year 1999, the tax reform 2000 was passed together with the “tax reduction law” (“Steuersenkungsgesetz”)⁶ in July 2000. This law

⁶ Bundesgesetzblatt Nr. 46, Teil 1, October 26, 2000, p. 1433 ff

then was amended by the respective “tax reduction amendment law” (“Steuersenkungsänderungsgesetz”) in November 2000.

Although the previous government had adjusted the tax rate after the constitutional court ruling on the tax exemption of the minimum living wage (“Steuerfreistellung des Existenzminimums”)⁷, the previous government did not implement many of the recommendations made by the so called Bareis-Report. The new red-green coalition government, however, rather quickly began to implement respective changes.

One central aim of the new German tax reform 2000 was – and still is – the reduction of the tax burden for large parts of the taxpayers and especially a tax relief for families. A marked reduction of the top income tax rate should also result in greater incentives for economic activities for the high-performance and high-income sectors of the population. Furthermore the aim was to make the tax law simpler, more transparent and fairer.⁸

The key elements of the new tax reform 2000 with its steps up to 2005 are listed in Table 2.

Table 2: New Income Tax Law 2000/2005: Key elements

- basic tax-exemption amount of 7 664 €
- top income tax rate at 42%
- reunification tax surcharge of 5.5% on the fixed income tax
- restriction of the loss deduction possibilities and resultantly the introduction of a minimum taxation
- No further tariff limitation for trade earnings; introduction of flat-rate trade tax with a general collection rate of 180%
- Higher taxation of extraordinary earnings
- Restriction of loss carry forward (“Verlustvortrag”) and loss carry back (“Verlustrücktrag”) possibilities
- Abolishment of tax reductions for farmers
- Abolishment of recognition of child care costs
- Abolishment of tax breaks to promote home ownership as well as child home building allowances (“Baukindergeld”); introduction of a support according to the home ownership allowance law (“Eigenheimzulagengesetz”)

⁷ Federal Constitutional Court ruling of September 25, 1992

⁸ A personal remark: That the law has become simpler or more transparent is really questionable after the experiences we made while programming the tax reform 2000 with all its step to 2005.

The tax reform 2000 had led to a change of both parameters that determine the total amount of tax payable: the tax assessment base and the tax rate. On the one hand the tax rate was reduced markedly and on the other hand the tax base was broadened. In other words: Income components that were previously not or only partly taxable are now taxable according to the tax reform bill 2000.

Calculating a new assessment base

To simulate the tax reform 2000/2005 on the basis of our 10% sample a new tax assessment bases had to be calculated. This tax base was then assessed with the applicable tax rate of 2005 and provides the income tax payable for the respective year. In the course of time the tax reform 2000/2005 had further changing items. Some expenditure items that reduced the tax burden in the past are no more or only partly applicable in 2005, e.g. a tax reduction of lower income. On the other hand, new tax reducing items like the lump-sum consideration of the trade tax have been instated.

To calculate the tax assessment basis for the year 2005 the **provisions for the minimum taxation** (“Mindestbesteuerung”) according to § 2 III EStG (Einkommensteuergesetz, Income Tax Law) had to be taken into account. The **limitation of loss compensation possibilities by balancing positive and negative income** leads here to a considerable change of the sum of all income (“Summe der Einkünfte”). Because of the extremely complicated rules for the loss compensation possibilities when the two spouses are assessed together we chose a simplified model for those couples that are commonly taxed according to the “splitting table” (“Splittingtabelle”). The accurate calculation for those cases where one partner can not compensate his losses and uses the compensation potential of his partner is controversial in the literature. Our simulation largely follows the wording of the income tax law EStG. In the case of a loss by one spouse that could not be compensated, both tax cases were combined and were treated as one taxpayer with a respective doubling of the assessment amounts (“Anrechnungsbeträge”).

In the further calculation steps between the sum of all income (“Summe der Einkünfte”) and the taxable income (“Zu versteuerndes Einkommen”) changes according personal **special expenditures** (“Sonderausgaben”) and **extraordinary burdens** (“Außergewöhnliche Belastungen”), e.g. the elimination of the consideration of child care costs or the restriction of loss carry forward and loss carry back possibilities, were taken into account. This taxable income then was assessed according the 2005 tax tariff to achieve the tariff wise income tax (“tarifliche Einkommensteuer”).

In the further calculation step between the tariff wise income tax and the final fixed income tax the further changes according to the 2005 tax law were incorporated, e.g. the **abolishment of tax reductions for farmers** or the **lump-sum consideration of the trade tax**.

Finally, **the reunification tax surcharge of 5.5%** was added to the fixed income tax to calculate the final 2005 tax burden.

To facilitate better comparability the **simulated amounts for the tax payers who received tax relief for self-used housing in 1995** (in accordance with the supplementary allowance for home owners law (“Eigenheimzulagengesetz”)) were deducted from the tax amount payable for 2005.

6.3 The “Karlsruhe proposal”

The “Karlsruhe proposal” of the Karlsruhe Research Group (Karlsruher Arbeitskreis 2001) was presented to the public in the summer of 2001. This research group consisting of renowned tax experts from the scientific community and practitioners was chaired by the former federal constitutional court judge Paul Kirchhof. They propose a fundamental simplification of the very complex German tax law ensuring a ‘just’ distribution of the tax burden.⁹ To meet this aim the tax law should be abandoned by any government steering mechanism. Through a rigorous enlargement of the tax base and a much simpler tariff structure the defined aims should be reached while at the same time keeping the government revenue constant. The assessment basis should be calculated according to the net assets addition theory (“Reinvermögenszugangstheorie”). Following this theory only one income source “income out of gainful economic activity” (“Einkünfte aus erwerbswirtschaftlichem Handeln”) should be considered. Nearly all lump-sum allowances for income related expenses, allowances for particular income sources as well as special expenditures, deductions and extraordinary burdens are not allowed anymore to be deducted from the taxable income.

The basis of assessment is however reduced by a tax allowance of 8 181 € (16 000 DM yearly) for every person of the family. For a family with two children only income above 32 723 € (64 000 DM) is taxable. The tax rate only needs two functional areas: The entry tax rate is 15% and rises till 27 610 € (54 000 DM) to 35%. Income above 27 610 € is taxed with the highest tax rate of 35%. Direct deductions from the tax payable amount (that are possible under the current tax law between the income tax according to tariff and the fixed income tax) are not contained anymore in the “Karlsruhe proposal”.

The key elements of the “Karlsruhe proposal” are summarised in Table 3.

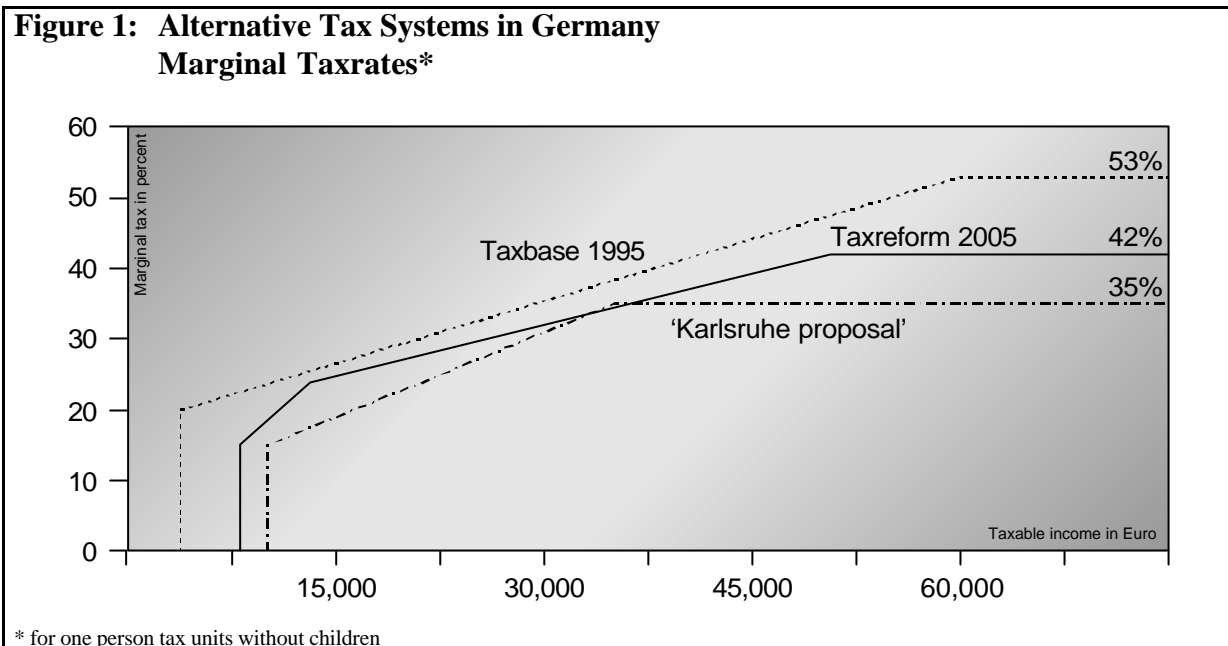
⁹ The aim of the reform proposal is “einen einfachen und systematischen Entwurf eines Einkommensteuergesetzes vorzulegen, in dem die rechtfertigenden Gründe für eine Steuerbelastung für jedermann bewusst werden, die Belastungsprinzipien allgemein verständlich sind und die Einkommensteuer wieder zu ihrer Grundfunktion, die Stärkung des Staatshaushaltes, zurückkehrt [to submit a simple and systematic draft of an income tax law, in which the justification for the tax burden is clear for everyone, the taxation principles are understandable for all and where the income tax again obtains its original function to strengthen the state finances]

The simulation of the “Karlsruhe proposal” had to be done with some restrictions. Some of the reform proposals are not realisable in practise. For example, the taxation of pensions when they are paid (“nachgelagerte Besteuerung”) could not be represented with the existing data because this group of individuals was up to now not fully liable for taxation and was therefore not represented in the data set. Furthermore some income components that were tax free up to now are now subject to taxation according to the “Karlsruhe proposal”.

Table 3: The “Karlsruhe proposal”: Key elements

- Entry tax rate of 15 % from the first € over the basic tax allowance
- top income tax rate of 35 % from 27 610 € over the basic tax allowance
- “Per person basic tax allowance” of 8 181 € per person, incl. children
- Only one source of income and therewith complete equalisation possibilities for negative income sources
⇒ no minimum taxation (“Mindestbesteuerung”)
- Rigorous enlargement of the tax base through:
 - taxation of capital gain (gain on sale)
 - taxation of social security wage substitution benefits (“Lohnersatzleistungen”) like unemployment benefits (“Arbeitslosengeld”)
 - taxation of extra pay for work at night, on Sundays and public holidays
 - taxation of 70% of the pension
 - No tax exemption for all charitable donations
 - No tax exemption for travel expenses for driving between home and workplace

Figure 1 summarizes the marginal taxrates of all tax system alternatives.



7 General Results

We present our microsimulation results of distributional and redistributive impacts of the New German tax reform in two chapters. Within the first chapter (this chapter 7) we present general results without further breakdowns. In the second chapter (chapter 8) we inspect the tax reform impacts for important socioeconomic groups.

Baseline for all our computations is the situation before the tax reform with the 1995 tax law (*Taxbase 1995, or briefly taxbase*). Compared to this baseline we analyse the new German tax reform effective since 2000 with its final stage 2005 (*Taxreform 2000/2005, or briefly taxreform*) and the discussed “Karlsruhe proposal” (*Taxproposal ‘Karlsruher Entwurf’, or briefly taxproposal*).

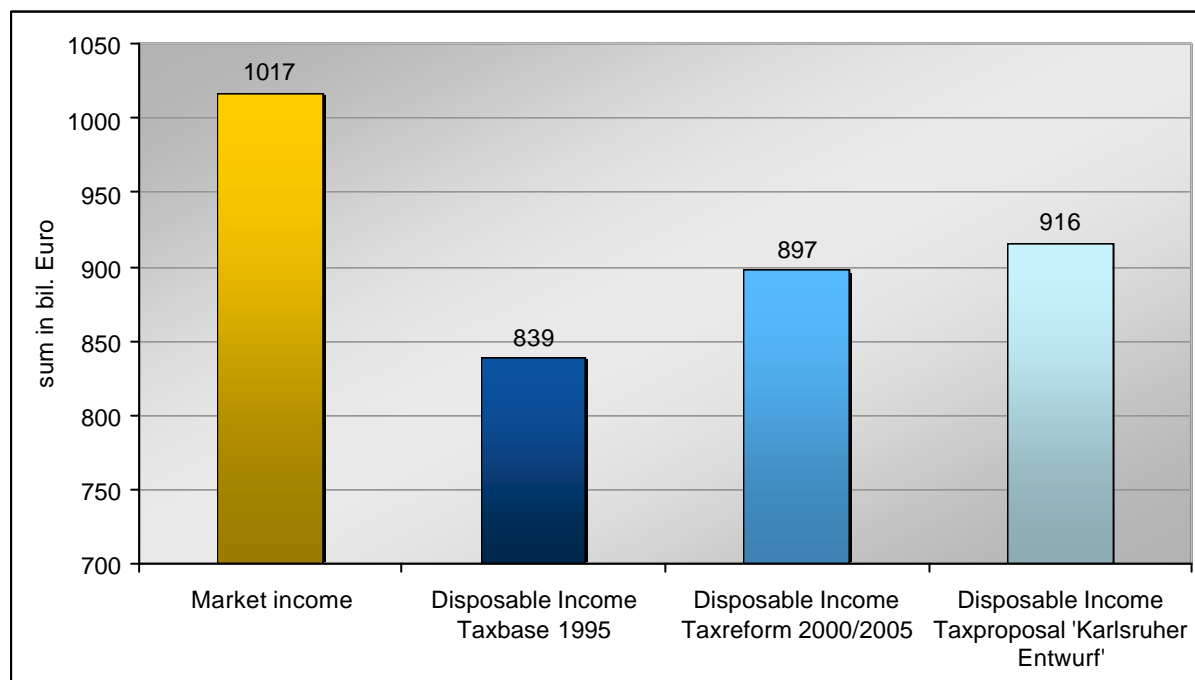
The general results are organised in two sections: **In the first section (7.1) general results about the overall size** of the alternatives’ impacts are discussed. **In the second section (7.2) general results about distributional and redistributive** impacts of the tax reform alternatives are analysed.

7.1 General results: Overall size of the tax reform alternatives

As mentioned above, the generated individual market income is our general individual gross income to which we compare the specific individual post tax income, our disposable income. Thus, this disposable income according to the tax system considers the tax dues and benefits but does not consider further transfers like unemployment or old age security contributions.

The overall market income based on the 1995 baseline data amounts to 1 017 billion €. As can be seen in Figure 2, the resulting overall disposable income of the tax alternatives is quite different to each other with the most tax payments by the 1995 tax system: taxbase with 839 billion € (-178 billion, -17.5%), taxreform with 897 billion € (-120 billion, - 11,8%) and taxproposal with 916 billion €(-101 billion, -9.9%). As a result of the tax reform 2000/2005 the taxes will be cut, when the last stage of the reform is completed, by 58 billion € (taxproposal by 77 billion €) compared to the former tax (baseline) situation, a remarkable tax cut. Thus, the “Karlsruhe proposal” provides the tax payers, compared to the tax reform 2000/2005, an overall 19 billion € higher disposable income.

Figure 2: Alternative Tax Systems in Germany – Overall Market Income and Disposable Income



Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

When interpreting this result, one should bear in mind that not all of the total tax relief is a result of the tax reform 2000. The original data 1995 describes the income situation 1995. Although it is possible to describe the end-situation in 2005, different relief and burden effects overlap each other. For instance, on the relief side the tax exemption of the so called subsistence income is taken into account. This was taken into account 1996 by a substantially higher basic tax exempt amount.¹⁰

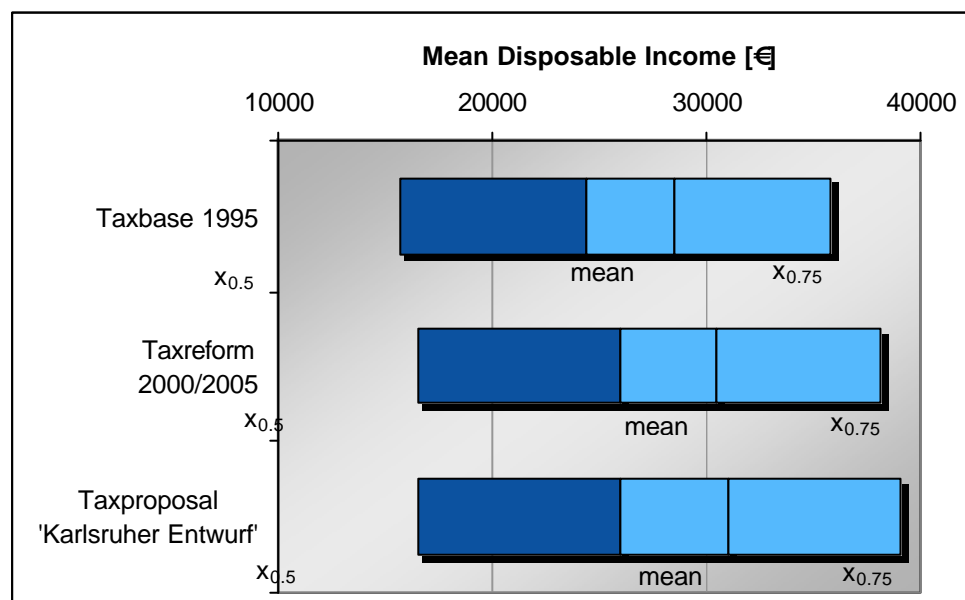
¹⁰ The data for the fourth quarter of 2002 of the wage- and income tax statistic 1998 will allow a more precise separation of the effects.

Altogether, both the effective tax reform as well as the “Karlsruhe proposal” cut the government tax revenue by around 60 billion €, a remarkable sum and push for the economy in Germany.

7.2 General results: Distributional and redistributive impacts of the tax reform alternatives

A first impression on how the three different tax laws overall effect the spread of the alternative disposable income is provided in Figure 3 showing the mean and the interquartile range by Box- and Whisker-Plots.

Figure 3: Alternative Tax Systems in Germany – Overall Distributional Impacts: Box-and Whisker-Plots



Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

The interquartile range with 50% of all earners (tax units) around the median is slightly larger under the effective tax reform and the “Karlsruhe proposal” compared to the taxbase situation indicating a wider disposable income spread by both reform alternatives. Due to the general tax cuts the mean and median of the disposable income are higher than under the former tax system.

A closer look to the general distributional and redistributive results now is based on Table 4 and Figures 4-6.

In Table 4 different measures of inequality of the market (gross) income and the disposal income of the taxbase, the effective taxreform and the “Karlsruhe proposal” (taxproposal) are shown.

The overall distributional and redistributional result: compared to the taxbase 1995 situation, both the actual taxreform as well as the “Karlsruhe proposal” result in a more unequal distribution but with no distinct overall effects. With a Gini-coefficient of 0,3917 (+4,0% compared to the taxbase Gini) the “Karlsruhe proposal” shows slightly more inequality than the taxreform itself (+1,8% compared to the taxbase Gini). However, redistributional differences are more pronounced. This is an interesting and generally not expected result because the “Karlsruhe proposal” – in some contrast to the actual taxreform - follows a particular stringent simple and transparent approach. However, and what a microsimulation analysis is able to disentangle in particular, as our further analyses will show, there are remarkable distributional and redistributional differences with regard to single socioeconomic groups.

A brief analysis of the overall market, taxbase, taxreform and taxproposal income distribution by a Kernel density estimation in Figure 4 shows the overall tax cut effects by all tax systems, the disposable income distributions are focused more on lower incomes. The most redistributional impacts has the taxbase 1995 system. In Figure 4 a remarkable peak for very low incomes is visible. A further inspection with the densities of occupational groups in Figure 9 shows that the ‘other income’ source (non labour income e.g. by a predominant income of letting and leasing, of capital gains etc.) is responsible for this low income peak. Many very low incomes, resulting of the special possibility for this group to take into account losses, result in this peak of relative frequent low income.

Measuring the distribution by the Gini-coefficient¹¹ (which is sensitive for the income region with great population density) the differences with regard to the middle income situation are quite low: the taxbase Gini is 0.3768, the taxreform Gini is 0.3837 (+ 1,8%) and the taxproposal Gini is 0.3917 (+ 4,0%).

The Atkinson-Index is calculated for Table 4 with a relative small ($\epsilon=1$) and a relative high ($\epsilon=2$) inequality aversion to cover a broad spectrum with a multitude of possible normative evaluations. The Atkinson-index is sensitive to changes in the lower part of the income distribution. The differences between the tax reform alternatives compared are relatively more pronounced with respect to a low inequality aversion ($\epsilon=1$: taxreform +3,7%, taxproposal + 6,0%; $\epsilon=2$: taxreform +1,0%, taxproposal +2,3%). Together with the low income sensitivity of the Atkinson-index in general, the relatively low Atkinson-indices above all show some indication for differences between the alternatives’ distributions in their respective upper income parts.

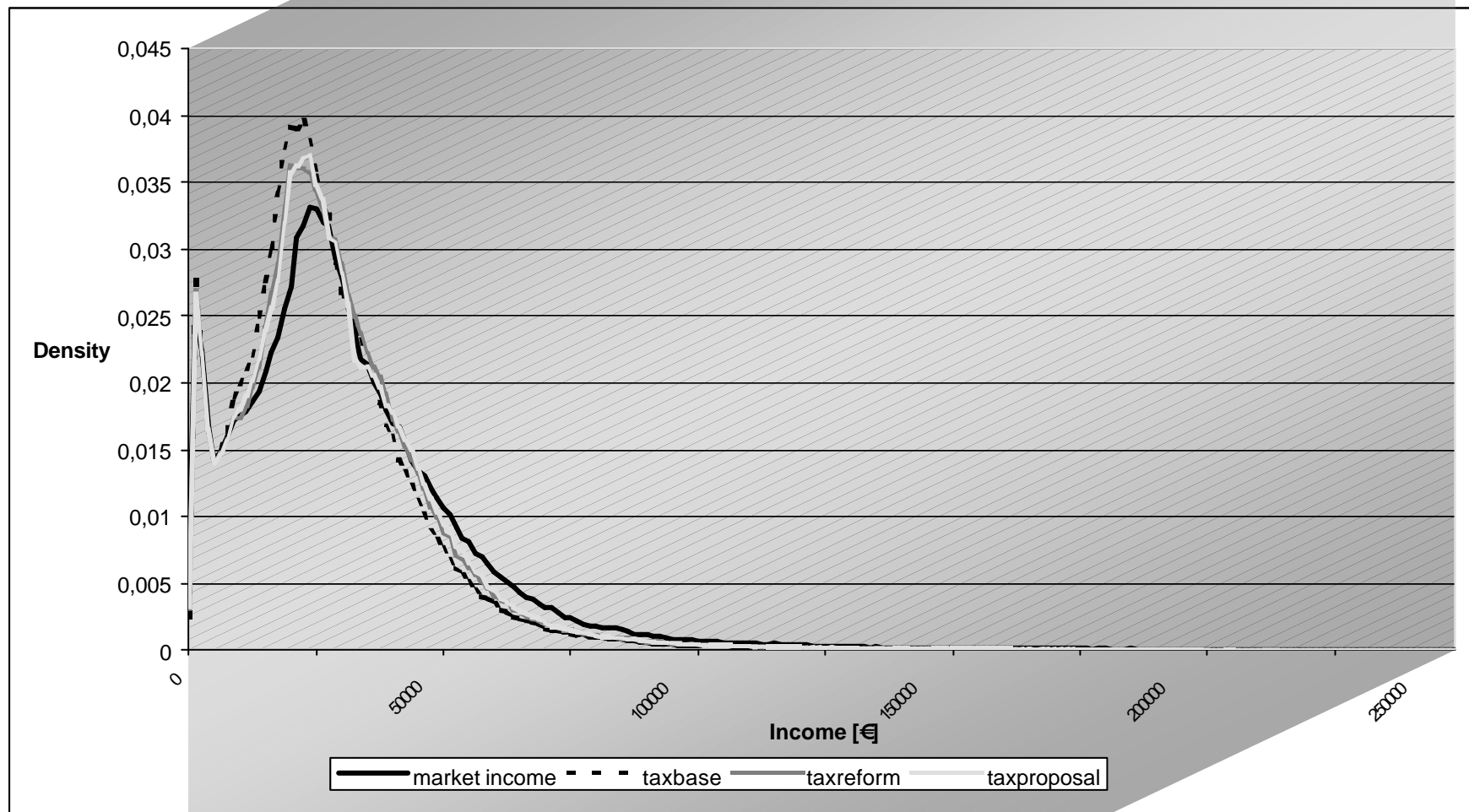
The decile shares describe the relation between the (ten percent) population share and their share of their total income. The differences between the tax alternatives within theses decile shares are neglectable (see also Figure 5 and the cumulative shares by the Lorenz curves in

¹¹ Methodological issues are provided in the Appendix 3

Figure 6). Notice, that under all systems only from the seventh decile the income shares are greater than 10%. Notice, too, that -regardless which tax system is considered- they are all far away from an equally distributed disposable income (as the Lorenz-curve show in Fig. 6).

The 90/10 ratio, which is the relation of the upmost 10% to the lowest 10% income share, underlines the disposable income inequality in favour of the rich under all the tax systems with 90/10 ratios between 27 and 30. For the effective taxreform 2000/2005 as well as for the “Karlsruhe proposal” the income share of the richest ten percent is about 29 times higher than the income share of the poorest ten percent.

**Figure 4: Alternative Tax Systems in Germany—
Kernel Estimates**



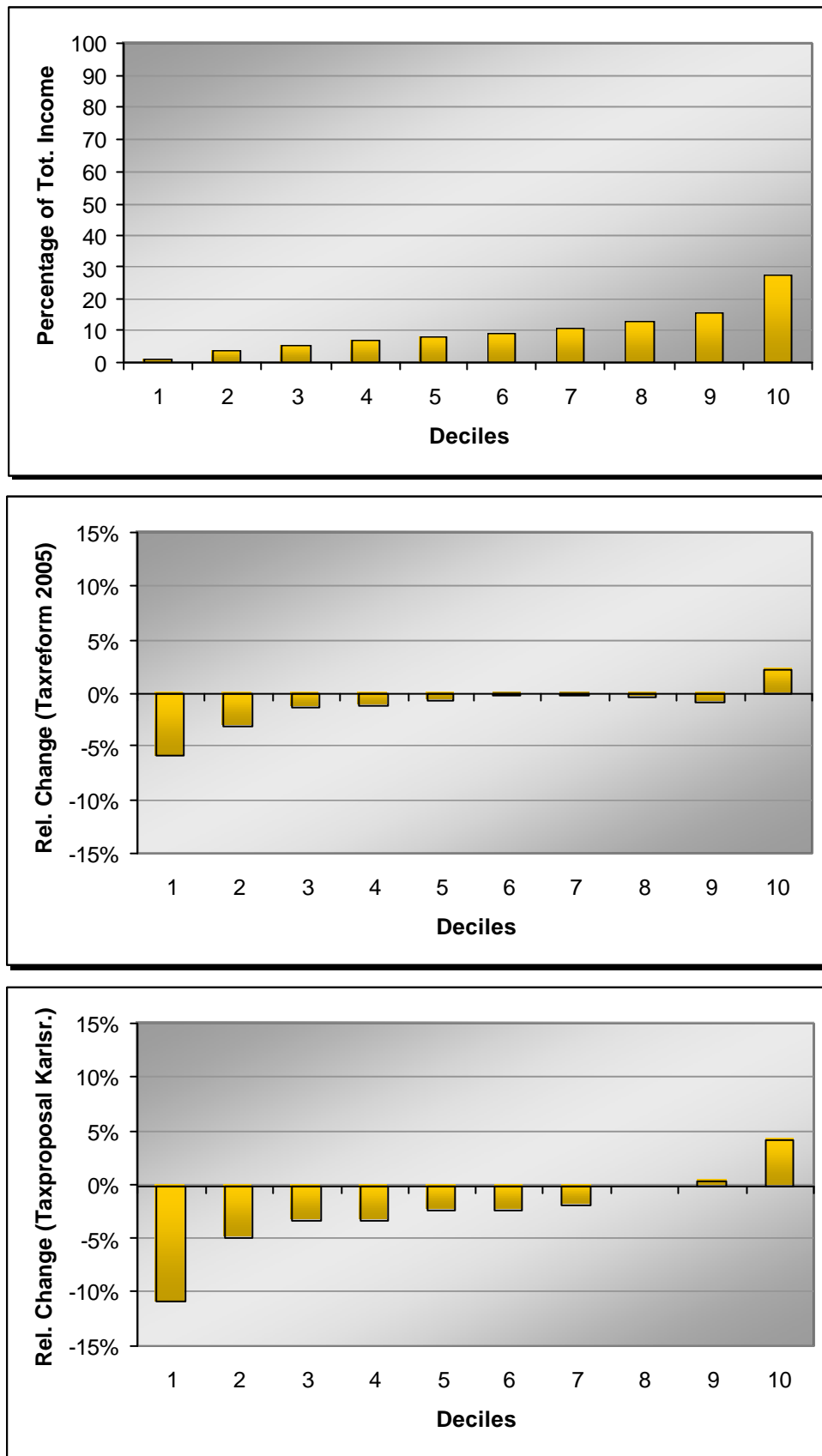
Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Table 4: Alternative Tax Systems in Germany – General Distributional and Redistributive Results

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	1 017		839		897		916	
Mean in EUR	34 532		28 497		30 470		31 081	
Median in EUR	27 924		24 422		26 012		26 028	
Distribution								
Gini-Coeffizient	0,4172		0,3768		0,3837		0,3917	
Aktinson Index mit $\varepsilon = 1$	0,3314		0,2869		0,2975		0,3042	
Aktinson Index mit $\varepsilon = 2$	0,8436		0,8072		0,8151		0,8255	
Theil Index	0,4080		0,3083		0,3326		0,3457	
Decile shares in % and decile limits in EUR								
1. Decile	0,9	6 793	1,0	6 707	1,0	6 777	0,9	6 795
2. Decile	3,1	14 141	3,6	13 265	3,5	13 956	3,4	13 819
3. Decile	4,9	19 694	5,5	17 694	5,4	18 710	5,3	18 740
4. Decile	6,3	23 933	6,8	21 095	6,7	22 332	6,6	22 395
5. Decile	7,5	27 924	8,0	24 422	7,9	26 012	7,8	26 028
6. Decile	8,7	32 474	9,2	28 211	9,2	30 122	9,0	30 166
7. Decile	10,2	38 521	10,7	32 976	10,7	35 158	10,5	35 721
8. Decile	12,3	46 671	12,6	39 228	12,6	41 683	12,6	42 947
9. Decile	15,3	60 508	15,3	49 578	15,2	52 262	15,4	54 232
10. Decile	30,8	-	27,3	-	27,9	-	28,4	-
90/10 Relation	36,3		27,0		29,3		30,2	
Redistribution								
R (%)	-		-8,1		-6,7		-5,1	
k(EUR)	-		- 2 789		- 2 313		- 1 759	

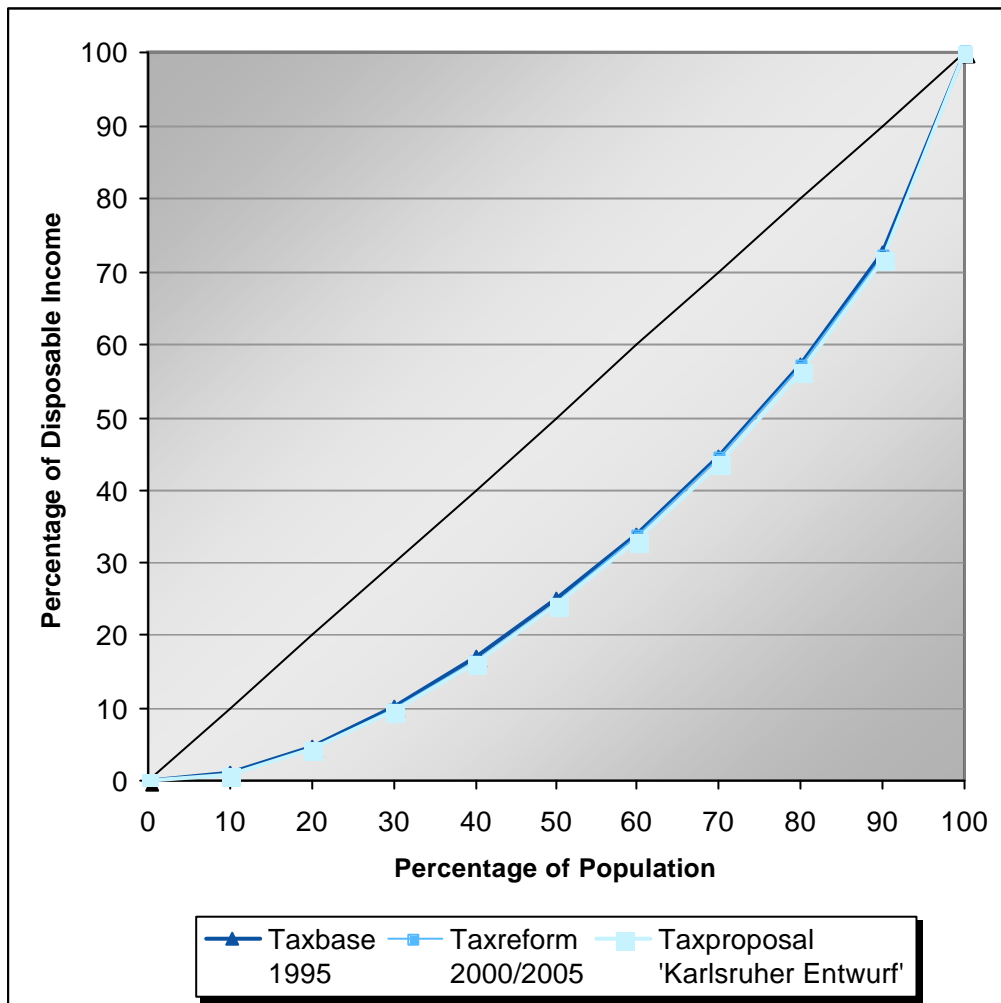
Source: Income Tax Statistic 1995, 10% Sample (n = 2 934 476; N = 29 444 074), own computations

Figure 5: Alternative Tax Systems in Germany – Deciles and Change in Deciles Compared to Taxbase 1995



Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Figure 6: Alternative Tax Systems in Germany – Lorenz-Curves



Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Redistributional impacts

One important aspect of any tax system is its redistributional impact. Comparing the market income distribution with the disposable income distribution of the different tax systems the Gini coefficient differences (taxbase -9.7% , taxreform -8% , taxproposal -6.1%) and the 90/10 relation differences (taxbase -25.6% , taxreform -19.3% , taxproposal -18.6%) already indicate less redistributional impacts by both alternatives.

A closer look with an overall redistributional and easily interpretable measure is given by Blackburn's 1989 k-measure. Blackburn considers a simple redistributive scheme: to every income unit below the median level of income an equal-sized, lump sum tax, is applied while transferring the value of the lump-sum tax to every unit above the median (or vice versa). The redistributional effect, the impact here of the taxation system, is that value of the lump-sum as

a percentage of the mean level of before tax income. As Blackburn (1989) has shown the respective index partitioning is valid only for the Gini-coefficient resulting in

$$(1) \quad R = k/\text{mean}_{\text{before tax}} = 2(\text{Gini}_{\text{after tax}} - \text{Gini}_{\text{before tax}})$$

With the market income as the before tax income and the respective disposable income of the tax system under consideration as the after tax the redistributive impacts of the German tax system and alternatives are as follows: R% as the percentage of mean market income, or equivalent k EUR, is the lump-sum necessary to make the disposable income distribution equally distributed (same inequality index) as the market ('gross') income: Taxbase R = -8.1% (k = -2 790 EUR), taxreform R = -6,7% (k = -2 316 EUR), taxproposal R = -5.1% (k = -1 759 EUR) is the necessary amount every person above the median had to transfer to the persons below the median to achieve the same distributional measure before and after.

Thus, though both alternatives have less redistributive impacts than the former taxbase 1995 system, the taxreform shows a higher redistribution than the taxproposal.

8 Results for socioeconomic groups

With our previous analyses we take in our mind that the income situation improves markedly by the effective taxreform and the taxproposal compared to the former system. In addition we saw no distinct distributional differences between the tax reform alternatives (taxreform and taxproposal) compared to the former taxbase 1995. However, redistributive differences between the alternatives are more pronounced.

The question now is how the two approaches – tax reform 2000/2005 and “Karlsruhe proposal” – will effect the distribution and redistribution of their higher disposable income for single socioeconomic groups.

The socioeconomic groups' effects analysis is organised as follows:

Section 8.1 defines the socioeconomic groups under investigation.

Section 8.2 analyses the tax burden impacts for important socioeconomic groups. There and in the following sections, in the upper part of each socioeconomic group's resulting figure an impression of the respective overall size of a baseline simulation (the 1995 tax law) item is given. In the lower part of each socioeconomic group and for the two tax alternatives – the 2000/2005 new German tax reform and the “Karlsruhe proposal” – the relative differences (in %) compared to the baseline simulation are shown.

Section 8.3 section quantifies the disposable income impacts for socioeconomic groups.

Section 8.4 discusses the distributional impacts for socioeconomic groups by important distributional measures like the Gini-coefficient and decile shares with their Lorenz curves.

Section 8.5 analyses the decomposition of inequality with inequality shares and contributions of each of the socioeconomic groups' breakdowns to the overall inequality of the respective socioeconomic group by the Shorrocks decomposition of the Theil measure based on a generalised entropy approach.

Section 8.6 finally presents the redistributive effects of the three tax systems by the concise Blackburn redistributive measure. Appendix 4 provides all socioeconomic group's single numerical results.

8.1 Defining socioeconomic groups

For the structural analysis the total population of the roughly 30 million taxpayers are divided in various socioeconomic groups. As important groups, both in the sense of their general societal and economic role and importance as well as targeted groups, we consider breakdowns by occupation, gender and family type.

Since the income tax statistic in general is the most suitable source (compared to other data bases) to investigate the situation of the self-employed on the micro level (see Merz 2000a), within the occupational breakdown, in particular, we further investigate and divide the self-employed not only by entrepreneurs and by professions (freelancers, liberal professions, "Freie Berufe"), but also more deeply the group of professions itself. The predominant income source will define an according occupation for a tax unit.

Occupation

The occupational groups were divided according to the 1995 predominant income – out of possible multiple income sources within a year - of the tax payer. Altogether we distinguish between the self-employed, the employees and others (with predominant income from capital gains, lease- and rent-income or other income ("Sonstige Einkünfte") according to § 2 I EStG) with four occupations:

- Professions ("Freiberufler")
- Entrepreneurs (and other self-employed¹² ("Gewerbetreibende und Sonstige Selbstständige"))
- Employees ("Abhängig Beschäftigte")
- Others („Sonstige Einkünfte“)

Professions

Professions are a prominent part of the self-employed. Ranging from the traditional professions like doctors, architects, lawyers, tax advisors, journalists, writers and authors, artists and designers, to the new professions like information brokers and environmental consultants. Professions have a far-reaching impact and influence on everybody as well as on

¹² Individuals with profit-income but not part of the professions

the economy and the society as a whole. They produce high-quality goods like healthcare and law, they protect individual freedom (through lawyers and journalists) and they have a special importance for the labour market and the economic processes.

In contrast to other countries¹³, in Germany freelance work, work by professions, is defined by the legal framework according to §18 Abs. 1 Nr. 1 Satz 2 EstG (Income tax law). As so-called ‘catalogue professions’ (“Katalogberufe”) there they are explicitly defined. A key element of what is termed a profession are self-employed activities concerned with science, art, writing, teaching, instructing or education.¹⁴

Alongside these definitions further socioeconomic attempts have been made to describe, classify and investigate professions. Examples are Deneke (1956, 1986), Büschges (1989), Sahner (1989) or Merz, Rauberger and Rönnau (1994), Merz (2000a) which all have analysed the particular scope, ‘mission’ of professions and societal and economic relevance.

For our analyses we consider the following six groups of professions (distinguished according to the ‘trade code’ (“Gewerbekennzahl”) out of approximately 420 000 professions in the Income Tax Statistic:

- Medical professions (“Heilkundliche Berufe”)
- Law- and business management-consultants (“Rechts- und Wirtschaftsberatende Berufe”)
- Technical and scientific professions (“Technische und naturwissenschaftliche Berufe”)
- Education and translation professions (“Pädagogische und übersetzende Berufe”)
- Journalists and artists (“Publizistische und künstlerische Berufe”)
- Other professions (“sonstige Freie Berufe”)

Because of the high degree of heterogeneity of “Other Professions” they will be considered in our further analyses rather as a remainder than as in detail.

¹³ **Professions, Liberal Professions, Freelancers (Freie Berufe): Definition of the Court of Justice of the European Communities:** The liberal professions just recently mentioned in Annex F(2) to the Sixth Directive 77/388 are activities which involve a marked intellectual character, require a high-level qualification and are usually subject to clear and strict professional regulation. In the exercise of such an activity, the personal element is of special importance and such exercise always involves a large measure of independence in the accomplishment of the professional activities. Source: Judgement of the Court of Justice of the European Communities (Second Chamber), 11 October 2001, case number C-267/99, Christiane Adam ./ Admisnistration de l’enregistrement et des domaines, on the interpretation of Annex F(2) of the Sixth Council Directive (77/388/EEC) of May 1977 on the harmonisation of the laws of the member States relating to turnover taxes – Common system of value added tax: uniform basis of assessment (OJ 1977 L 145, p.1).

¹⁴ The tax law in particular (as “Katalogberufe”) describe self-employed professional activities as activities of medical doctors, dentists, veterinarians, lawyers, notaries, patent attorneys, surveying engineers, engineers, architects, trade chemists, auditors (public accountants), tax consultants, consulting economists and business administrators, sworn in auditors, authorised tax agents (Steuerbevollmächtigte), nonmedical practitioners, physiotherapists, journalists, translators, pilots and similar professions (“ähnliche Berufe”).

For the ‘similar professions’, next to being self-employed and self-responsible, it has been decided by the courts that further elements for classification of professions are an individual specialised knowledge of the subject at hand, practising at own risk and on own account. Hereby it is permissible to for the professional to also make use of services supplied by a third party (like an assistant working under a dentist, for instance).

Gender

Though gender might not be an explicit but an implicit target with regard to labour market opportunities and the family situation, we have a look to those implicit impacts of the tax alternatives. Because only in the case of a one person tax unit (and not in the case of a common taxation (“Gemeinsame Veranlagung, Splittingtabelle”) the gender of a tax unit can be detected. In Germany, 1995 there are about 13 million (out of a total of ca. 30 million) one person tax units in the 1995 Income Tax Statistic.

Family type

The family structure, at least targeted via the explicit consideration for children in the tax alternatives, will be a further socioeconomic breakdown in our analyses. Though the tax unit naturally is in the focus of the Income Tax Statistic, we are able to approximate a family type with the help of parameters of one person tax units, common assessed tax units, as well as child tax exemption amounts (“Kinderfreibeträge”) in general. We consider the following five family types:

- Single without a child (**one person tax unit without children**)
- Single with children (**one person tax unit with children**)
- Married couple without a child
- Married couple with one child
- Married couple with more than one child.

Because child tax exemption amounts are not bound to the place of residence and can be transferred in the case of divorced couples, possible distortions are possible by our procedure. Furthermore, children living in the household can also be eligible to pay tax by themselves resulting as separate tax units.

8.2 Tax burden impacts of tax reform alternatives for socioeconomic groups

An overview about the tax burden for the tax reform alternatives divided by the above mentioned four socio-economic groups formed are provided by Table 5. Compared to the taxbase situation before the reform, the overall tax burden according the taxreform and the “Karlsruhe proposal” with their relative difference to the baseline tax burden are shown in that table.

Table 5: Alternative Tax Systems in Germany – Overall Taxes by Socioeconomic Breakdowns

	Taxes				
	Taxbase 1995 bil. €	Taxreform 2000/2005 bil. € Difference ¹		Taxproposal 'Karlsruher Entwurf' bil. € Difference ¹	
All	178	120	-32,8 %	111	-37,4 %
Occupation					
Professions	7	5	-23,1 %	5	-30,8 %
Entrepreneurs	33	21	-35,9 %	19	-42,2 %
Employees	131	88	-33,1 %	73	-44,4 %
Others	6	5	-16,7 %	5	-25,0 %
Professions					
medical	3,9	3,1	-21,4 %	2,6	-32,8 %
legal and economic advisors	1,1	0,9	-21,1 %	0,8	-30,0 %
technical and scientific	1,1	0,9	-21,5 %	0,8	-30,7 %
pedagogic and translating	0,2	0,1	-30,0 %	0,1	-36,4 %
publicistic and artistic	0,3	0,2	-24,1 %	0,2	-32,6 %
Gender					
Men	35	25	-29,4 %	23	-33,8 %
Women	20	14	-32,5 %	13	-35,0 %
Family-Type					
Single	49	35	-29,2 %	33	-32,8 %
Single /w children	5	3	-40,0 %	3	-49,1 %
Married couple	46	31	-32,2 %	31	-32,2 %
Married couple /w one child	31	20	-33,3 %	15	-50,1 %
Married couple /w two or more children	46	29	-36,0 %	18	-59,6 %

¹ Taxalternative-Taxbase in percent

Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Occupation: Compared to the taxbase all occupational groups gain more from the taxproposal than from the taxreform. Next to others, Professions remarkably gain less tax cuts than entrepreneurs and employees for the taxreform as well as for the taxproposal. One reason certainly is the different trade tax treatment of the entrepreneurs (trade tax) and the professions (no trade tax) and all the income differences now shown by our factual incidence analysis.

Professions: there are remarkable differences in the tax gain structure of different professional occupations in both alternatives (taxreform and taxproposal). However, in both alternatives medical professions, which encompass almost 50% of all professions, as well as pedagogic and translating professions gain the most by the new tax reform alternatives.

Gender: More than one third of all taxes under consideration are paid by women. Though this relation holds on for the tax alternatives it is shown, that women in relative terms profit by the tax alternatives more than men. Note, according to gender only one person tax units could be considered.

Family type: It is evident, that both, the effective tax reform as well as the “Karlsruhe proposal” is in favour for consideration of children. Singles and married couples with children have a greater tax reduction in both alternatives than singles and married couples without children. In the “Karlsruhe proposal” this reduction is even larger and larger than approximately 50% of the taxbase burden. Naturally, the children effect is accompanied by all the different family income situations and is now shown by our factual incidence analysis.

Taxrate impacts for socioeconomic groups

In addition to the discussed mean tax burden of Table 5 we now investigate the mean taxrates resulting of the tax reform alternatives for socioeconomic groups. Table 6 provides the numerical overview.

Table 6: Alternative Tax Systems in Germany – Mean Taxrates [%] by Socioeconomic Breakdowns

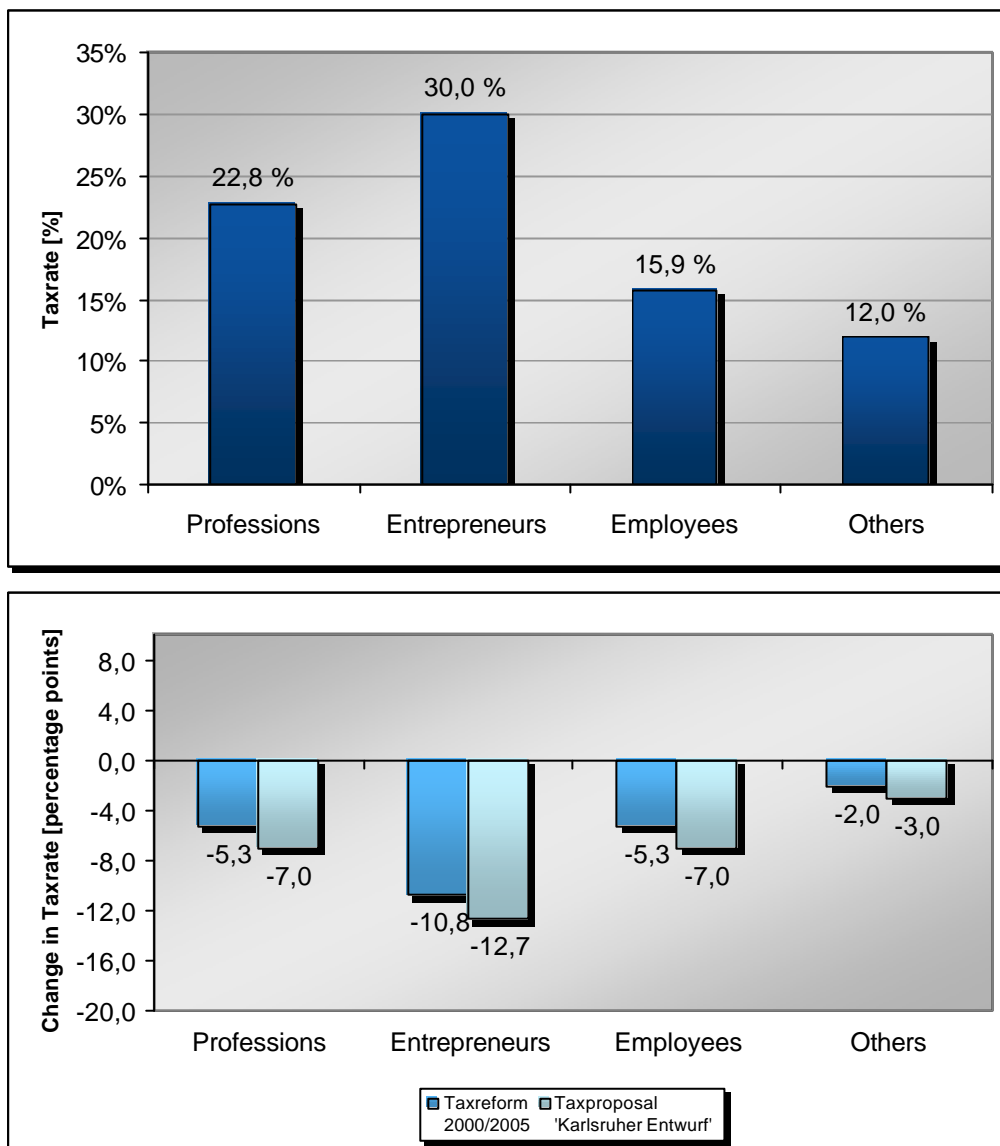
	Mean Taxrate		
	Taxbase 1995	Taxreform 2000/2005	Taxproposal 'Karlsruher Entwurf'
All	17,5 %	11,8 %	10,0 %
Occupation			
Professions	22,8 %	17,5 %	15,8 %
Entrepreneurs	30,0 %	19,2 %	17,4 %
Employees	15,9 %	10,6 %	8,8 %
Others	12,0 %	10,0 %	9,0 %
Professions			
medical	26,2 %	20,6 %	17,6 %
legal and economic advisors	25,3 %	19,9 %	17,7 %
technical and scientific	23,0 %	18,1 %	15,9 %
pedagogic and translating	16,9 %	11,8 %	10,7 %
publicistic and artistic	20,1 %	15,2 %	13,5 %
Gender			
Men	18,8 %	13,3 %	12,5 %
Women	15,6 %	10,5 %	9,9 %
Family-Type			
Single	17,4 %	12,3 %	11,7 %
Single /w children	15,6 %	9,4 %	7,9 %
Married couple	16,5 %	11,2 %	11,2 %
Married couple /w one child	17,5 %	11,7 %	8,7 %
Married couple /w two or more children	18,5 %	11,8 %	7,5 %

Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

As mentioned, we represent the results for each socioeconomic group by figures where in the upper part the relative amount according the taxbase is given, whereas in the lower part the relative differences of the tax reform alternatives compared to the taxbase are shown.

Occupation: As can be seen in Figure 7a, the average tax burden in 1995 is with 30% highest for the entrepreneurs, followed by the professions and the employees. One reason is the special burden of the trade tax, which is only applicable for the entrepreneurs. Although the trade tax can be deducted as an expense and the income derived from trade is only taxed at a reduced highest tax rate, nevertheless this leads to an additional burden. Another reason is the higher self-employed income in general (see next chapter) and the progressivity of the tax laws.

Figure 7a: Alternative Tax Systems in Germany – Mean Taxrates [%] and Changes in Taxrates compared to Taxbase 1995 Occupation



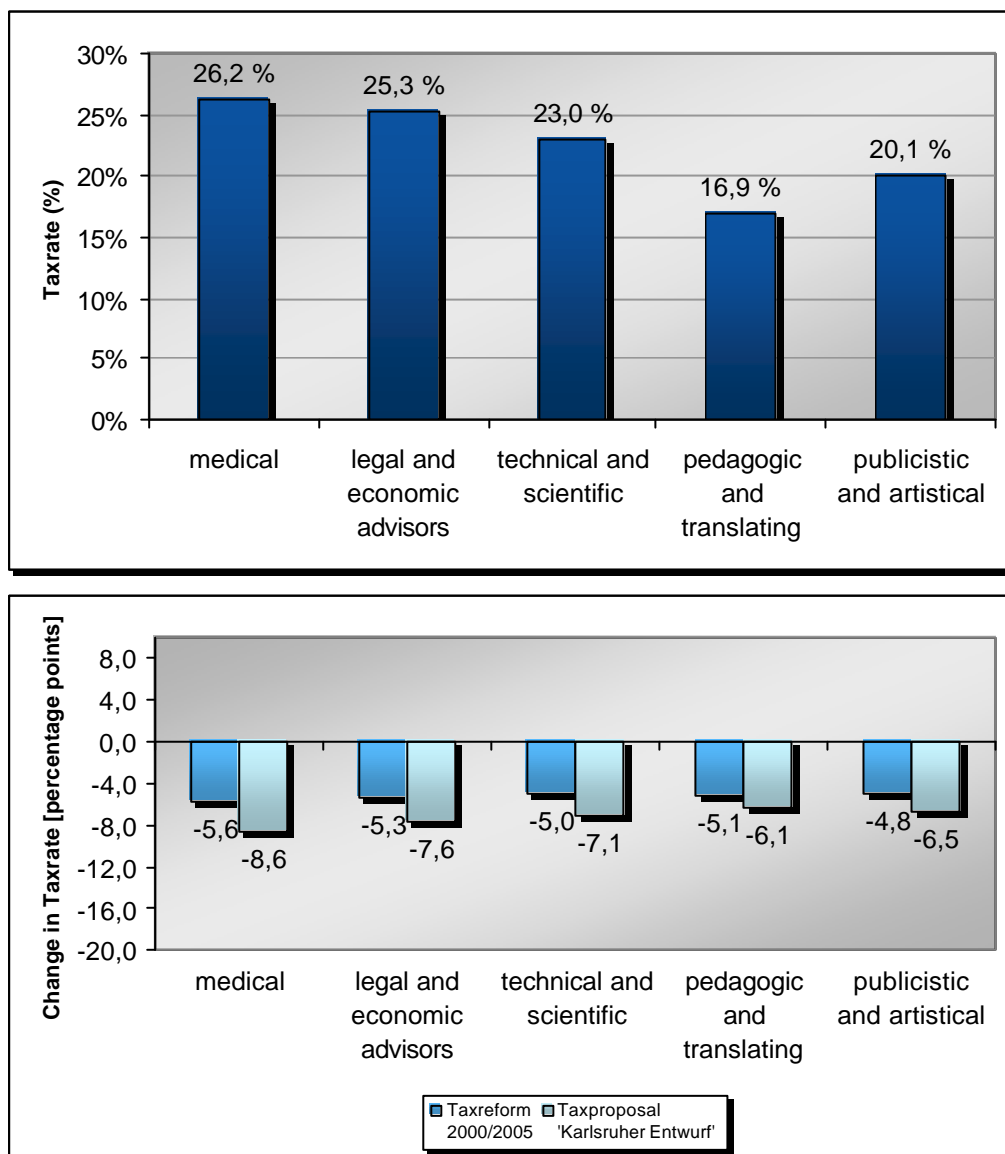
Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

The tax relief resulting from the tax reform 2000/2005 and the “Karlsruhe proposal” especially benefits the entrepreneurs. The fact that the trade tax is being considered for the largest part in the calculation of the income tax in the tax reform 2000/2005 already leads to a fairly large tax relief. That the trade tax is not totally compensated becomes evident when compared to the “Karlsruhe proposal”. The further tax relief here is a result of the total abolishment of the trade tax.

Professions and employees participate nearly equally from the changes made to the tax system. The further gain from the “Karlsruhe proposal” for the employees can be explained by the significant rise in the child tax exemption amounts. These have a greater effect in the

lower income groups as in those with higher income, because not used tax exemption amounts are counterbalanced by a further child allowance. Furthermore it can be presumed that families with children will more likely be part of the employee group and that this group therefore profits above average from the tax exempt amounts proposed by the “Karlsruhe proposal” (see the family type discussion).

Figure 7b: Alternative Tax Systems in Germany – Mean Taxrates [%] and Changes in Taxrates compared to Taxbase 1995 Professions

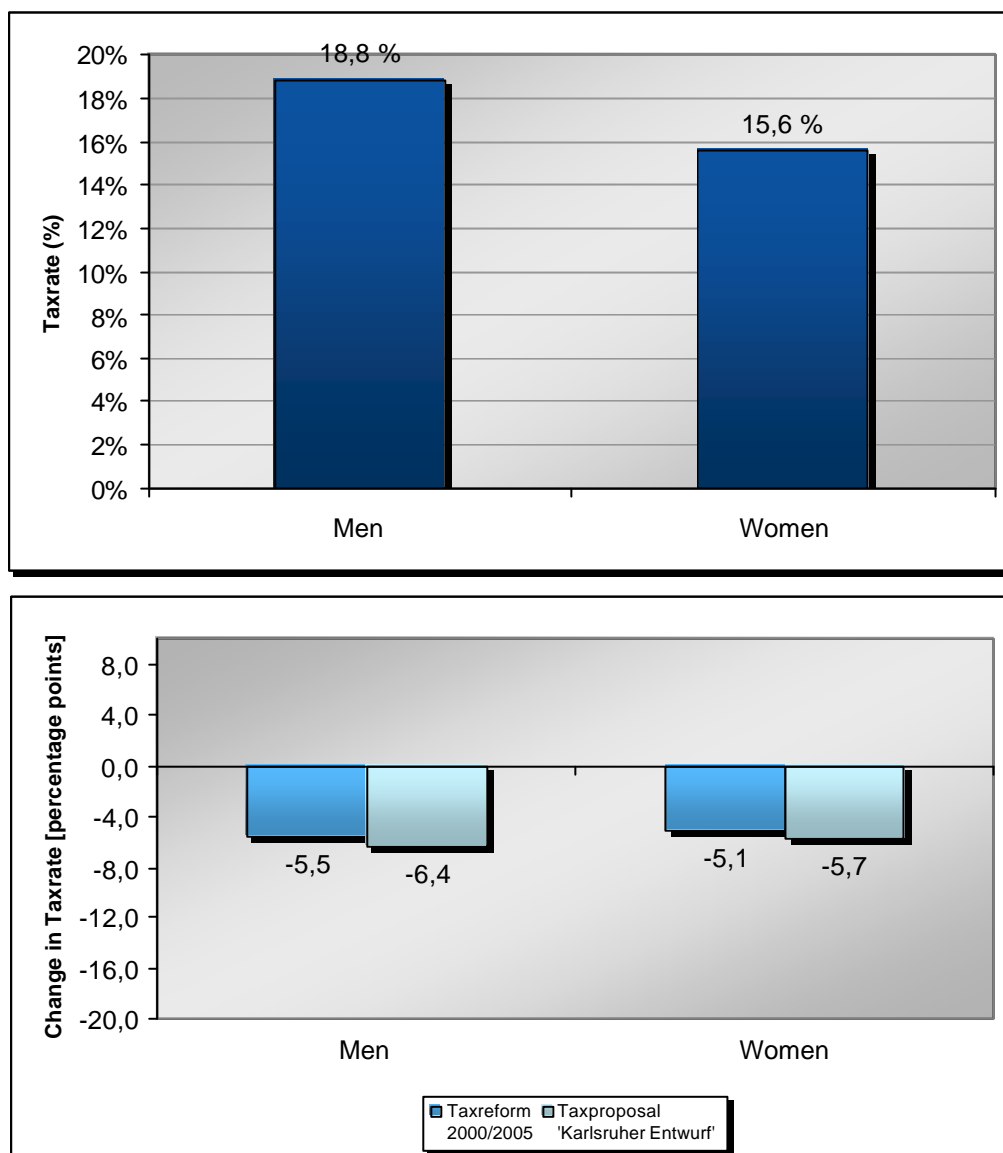


Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Professions: With regard to overall professions both tax reform alternatives show no difference in reducing the taxrate. However, as it is shown in Figure 7b, the mean tax rates are quite different from 26,2% for medical professions to 16,9% for pedagogic and translating

professions. This is certainly a result of different income levels (see next chapter) and the progressiveness of the tax systems.

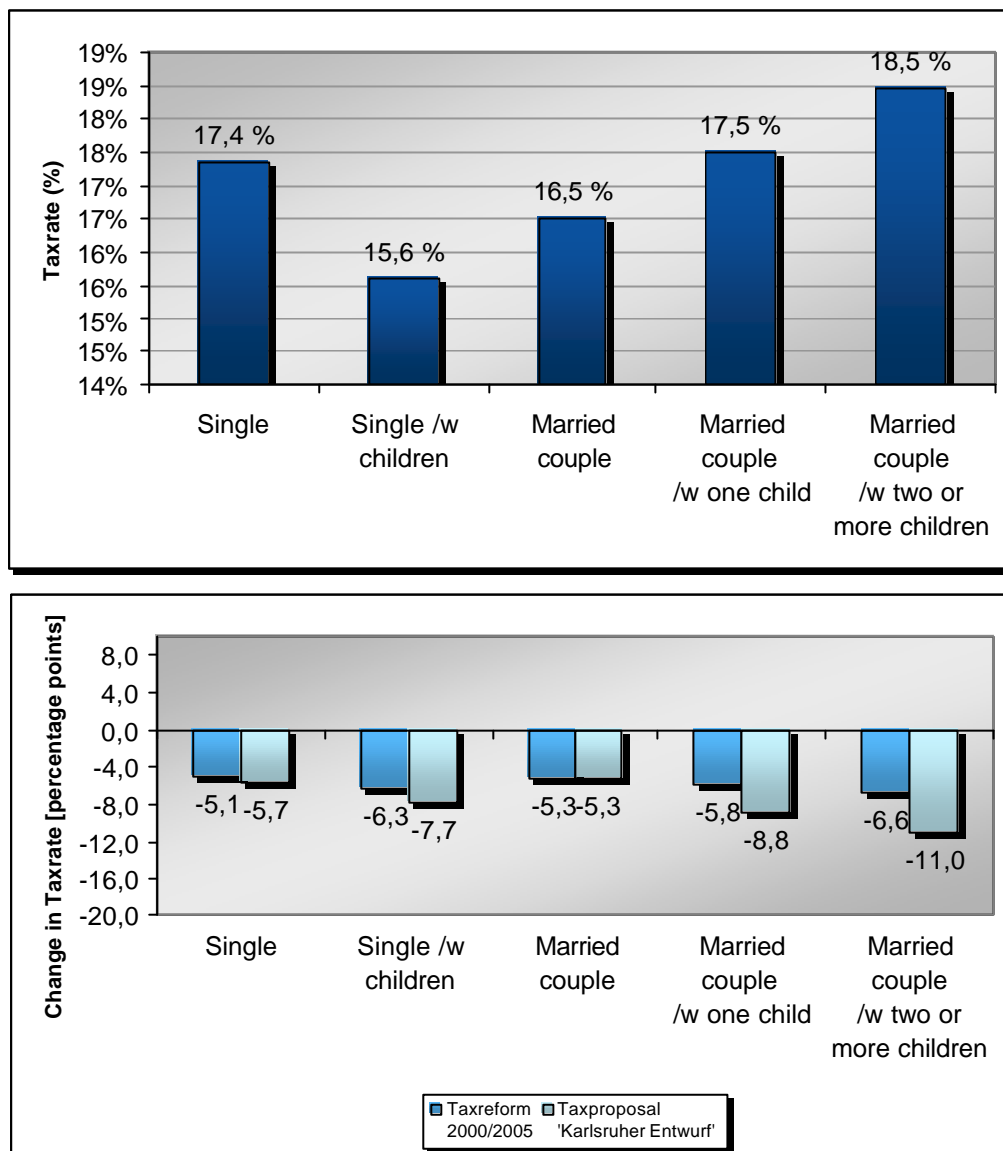
Figure 7c: Alternative Tax Systems in Germany – Mean Taxrate [%] and Changes in Taxrates compared to Taxbase 1995 Gender



Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Gender: Because of the progressive nature of the tax rates and the higher income for men than for women (see next chapter) the average tax rate for women (15.6%) is lower than for men (18,8%). The tax alternatives' results indicate that a broadening of the tax base affect men and women equally. Both benefit from the reduction in the tax rates, however because in the average men have a higher tax rate in the initial situation, they benefit slightly more by the tax alternatives.

Figure 7d: Alternative Tax Systems in Germany – Mean Taxrates [%] and Changes in Taxrates compared to Taxbase 1995 Family-Type



Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Family type: The mean taxrates for all the family types only varies between 15,6% (single with children) and 18,5% (married couple with children). As discussing the tax burden above the “Karlsruhe proposal” relieves in particular families with children with most gains for married couples.

Altogether: The microsimulation analyses of the tax reform impacts according the tax burden and mean taxrate have shown remarkable different tax burden impacts for the above

socioeconomic groups. The results of factual incidence show the joint effects of different tax systems as well as different living conditions with different earned income.

8.3 Disposable income impacts of the tax reform alternatives for socioeconomic groups

Before we discuss the distributional and redistributional impacts of the tax reform alternatives we characterise a central measure of income location by presenting the respective mean disposable incomes for the socioeconomic groups. As it is evident, the discussion of the alternatives' impact on the disposable income is mirroring the above discussion of the tax burden and the taxrate. Thus we are very short in describing the details without further reasoning.

The overview in Table 7 shows the absolute and relative changes of the disposable income compared to the taxbase 1995 for the socioeconomic groups.

Table 7: Alternative Tax Systems in Germany – Mean Disposable Income by Socioeconomic Breakdowns

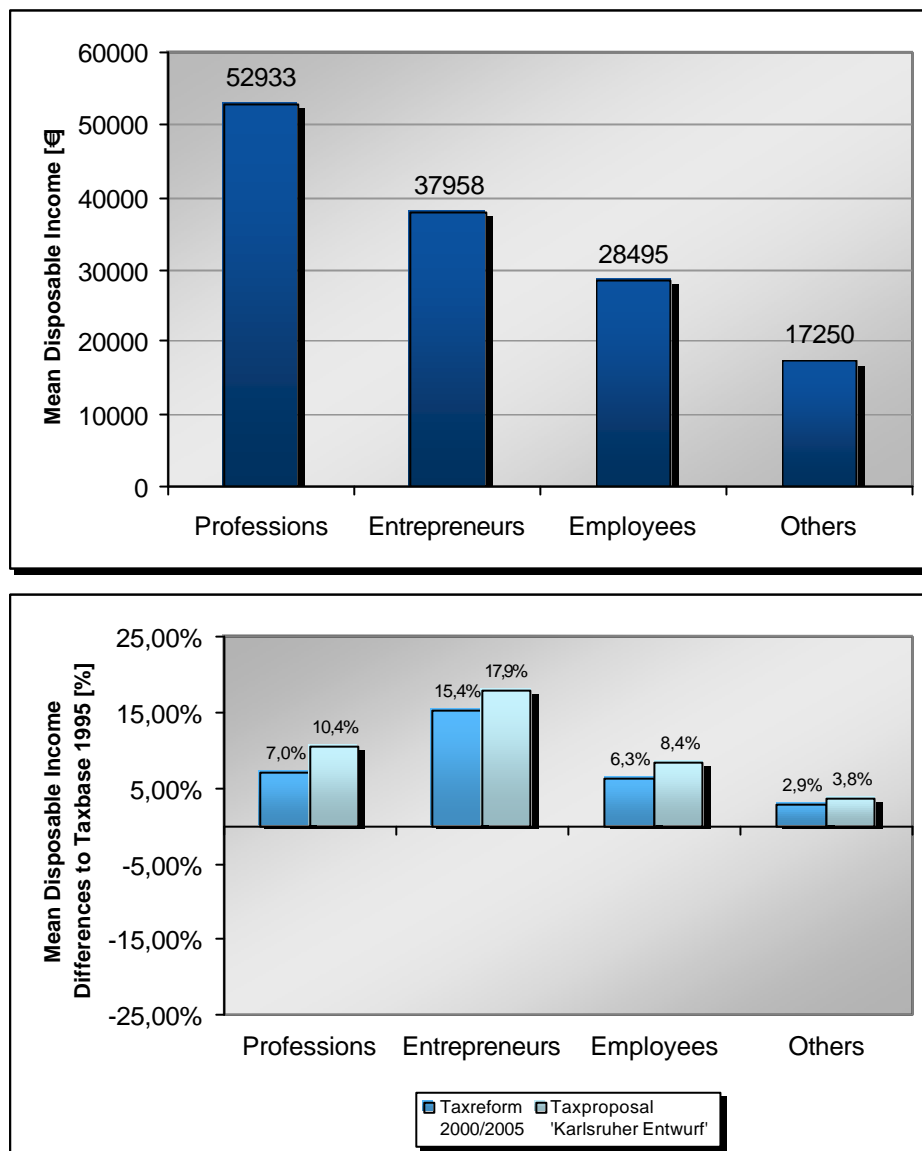
	Mean Disposable Income				
	Taxbase 1995	Taxreform 2000/2005		Taxproposal 'Karlsruher Entwurf'	
	€	Difference to Taxbase		Difference to Taxbase	
	€	€	%	€	%
All	28 497	+ 1 973	+ 6,9 %	+ 2 584	+ 9,1 %
Occupation					
Professions	52 933	+ 3 716	+ 7,0 %	+ 5 508	+ 10,4 %
Entrepreneurs	37 958	+ 5 832	+ 15,4 %	+ 6 804	+ 17,9 %
Employees	28 495	+ 1 786	+ 6,3 %	+ 2 394	+ 8,4 %
Others	17 250	+ 494	+ 2,9 %	+ 650	+ 3,8 %
Professions					
medical	81 805	+ 6 216	+ 7,6 %	+ 9 722	+ 11,9 %
legal and economic advisors	61 239	+ 4 372	+ 7,1 %	+ 6 285	+ 10,3 %
technical and scientific	50 922	+ 3 288	+ 6,5 %	+ 4 658	+ 9,1 %
pedagogic and translating	23 377	+ 1 407	+ 6,0 %	+ 1 696	+ 7,3 %
publicistic and artistic	23 357	+ 1 464	+ 6,3 %	+ 1 858	+ 8,0 %
Gender					
Men	38 904	+ 2 800	+ 7,2 %	+ 4 132	+ 10,6 %
Women	40 327	+ 3 288	+ 8,2 %	+ 5 413	+ 13,4 %
Family-Type					
Single	18 172	+ 1 149	+ 6,3 %	+ 1 263	+ 6,9 %
Single /w children	21 126	+ 1 334	+ 6,3 %	+ 1 908	+ 9,0 %
Married couple	35 266	+ 2 252	+ 6,4 %	+ 2 285	+ 6,5 %
Married couple /w one child	38 904	+ 2 800	+ 7,2 %	+ 4 132	+ 10,6 %
Married couple /w two or more children	40 327	+ 3 288	+ 8,2 %	+ 5 413	+ 13,4 %

Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

The overall mean gain from the effective tax reform is 1 973 € (6,9%) and even higher from the “Karlsruhe proposal” with 2 584 € (9,1%) compared to the taxbase 1995. However, there is a wide spread according the mean disposable income over the socioeconomic groups.

Occupation: Professions earn the most: with 52 933 € their mean disposable income is almost two times as high than the employees’ income (Figure 8a). The mean entrepreneur’s disposable income with 37 958 € is between the employee’s mean income (28 495 €) and the professions’ mean income (52 933 €). Entrepreneurs gain the most of the reform alternatives.

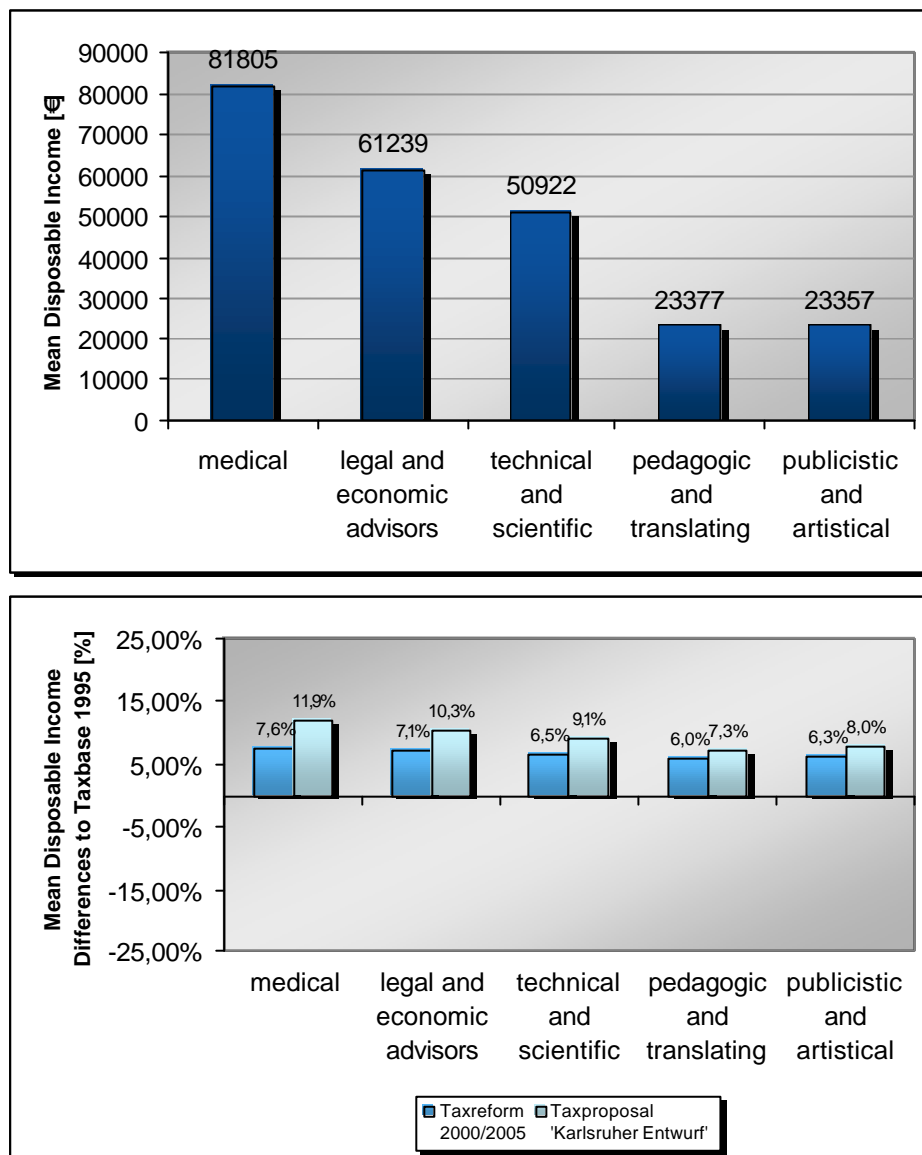
Figure 8a: Alternative Tax Systems in Germany – Mean Disposable Income [€] and Relative Changes Compared to Taxbase Occupation



Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Professions: Though on the average professions earn the most, there is a wide spread within this group. The disposable income ranges from 81 805 € for medical professions to 23 377 € (28,6% of the medical income) for the pedagogic and translating professions (Figure 8b). Though there are not remarkable differences in the tax reform alternatives' impacts, medical professions gain the most.

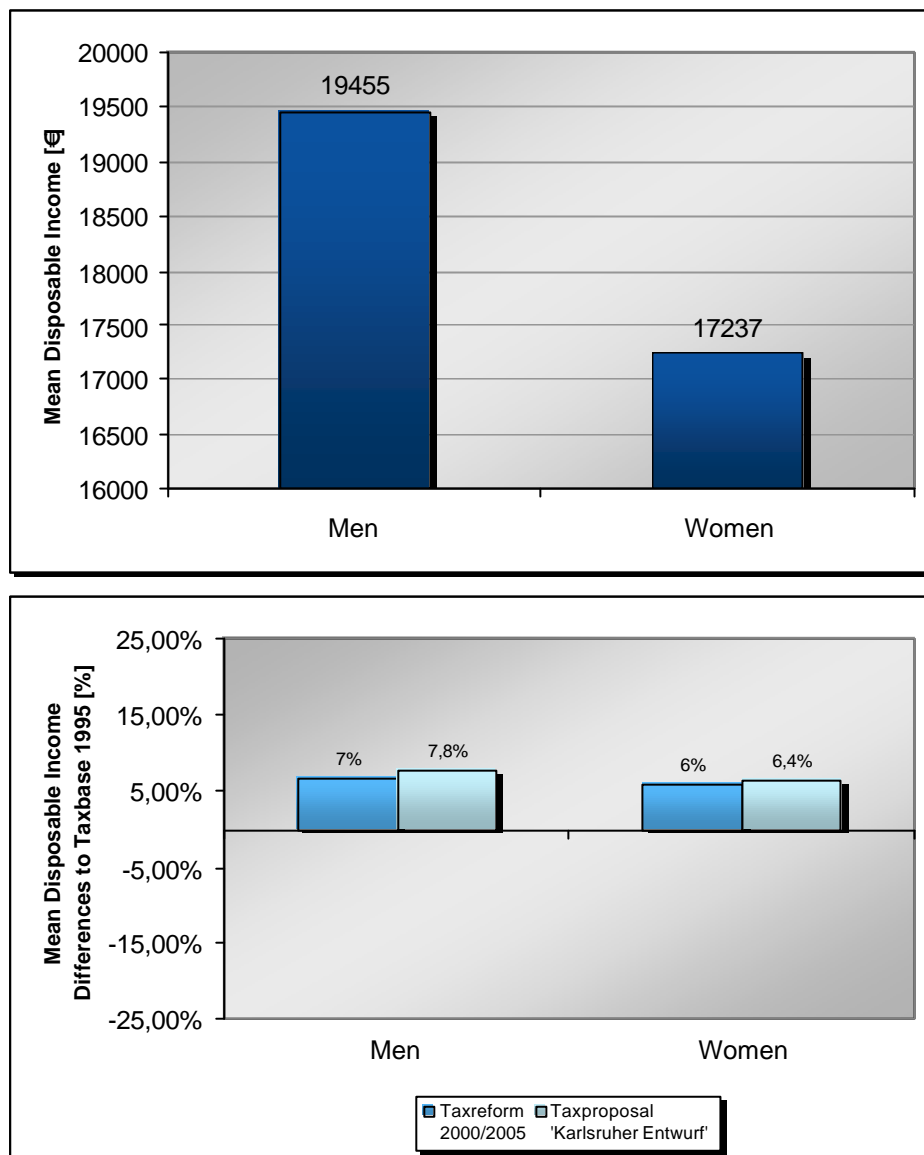
Figure 8b: Alternative Tax Systems in Germany – Mean Disposable Income [€] and Relative Changes Compared to Taxbase Professions



Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Gender: Men's mean disposable income is about 19 455 € compared to 17 237 €. Because here only single tax payers are considered, it might be expected that the difference is not very distinct (Figure 8c). The tax reform alternatives accordingly show no distinct different impacts, though the gain is slightly higher for men.

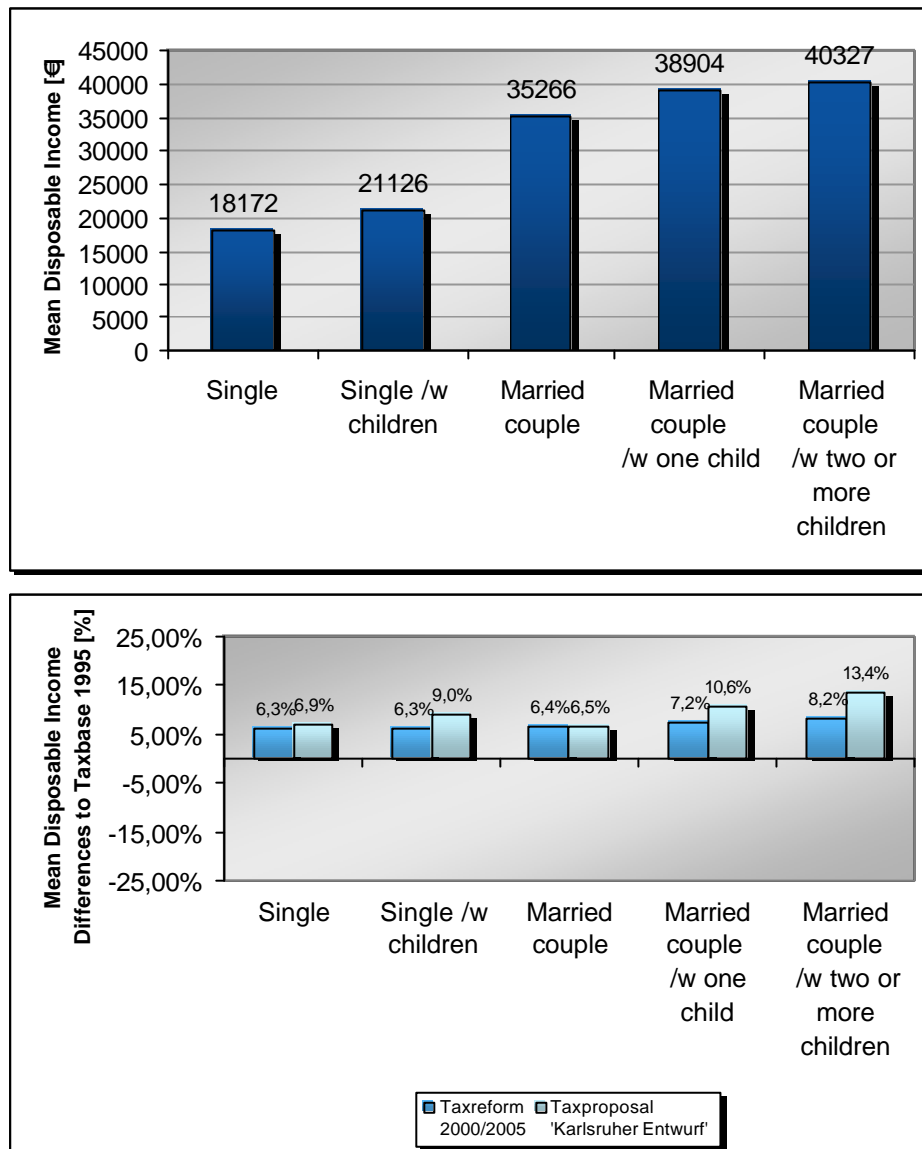
Figure 8c: Alternative Tax Systems in Germany – Mean Disposable Income [€] and Relative Changes Compared to Taxbase Gender



Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Family type: Mean disposable income ranges from 40 327 € for married couples with children up to singles with 18 172 € (Figure 8d). Again the different treatment of the tax systems with child allowances and child tax exempt amounts is effective. Furthermore the combined earnings of couples leads to a higher average income compared to single tax payers. The “Karlsruhe proposal” not only is in favour for families with children but slightly increases the disposable income of singles as well.

Figure 8d: Alternative Tax Systems in Germany – Mean Disposable Income [€] and Relative Changes Compared to Taxbase By Family-Type



Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

8.4 Distributional impacts of the tax reform alternatives for socioeconomic groups

Now, let us consider the distributional effects concerning our socioeconomic group measured by the Gini-coefficient and further by decile shares and the respective Lorenz curve with its cumulative income and population shares.¹⁵

¹⁵ For methodological issues see e.g. Cowell 1995

Occupation

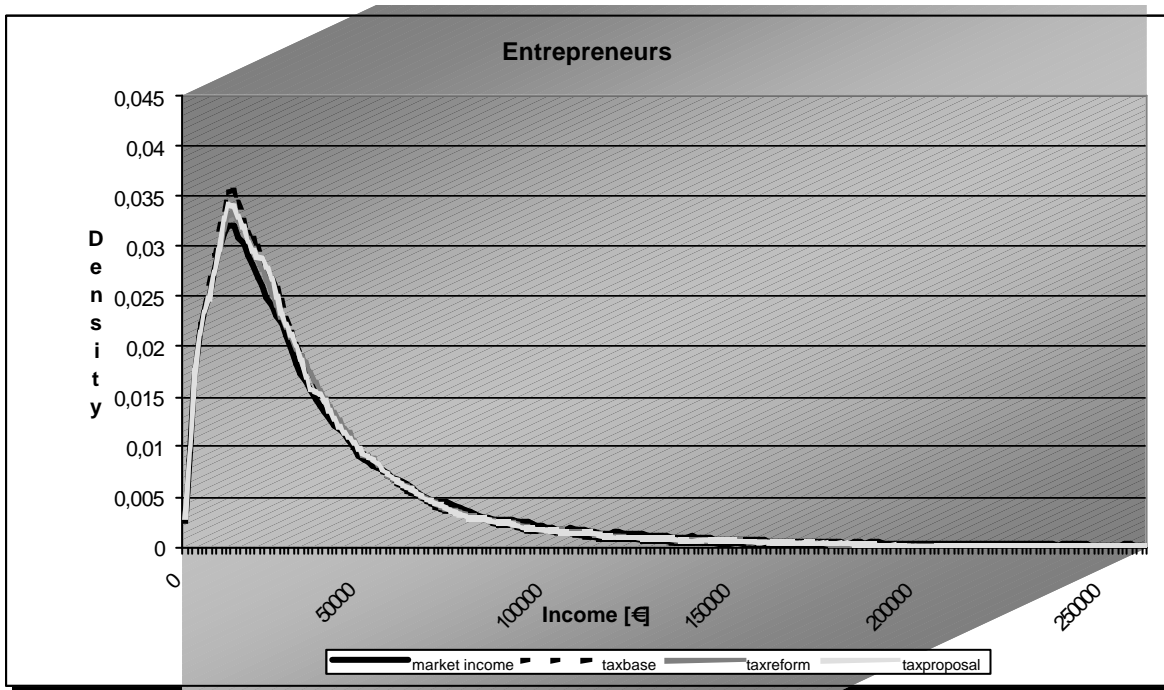
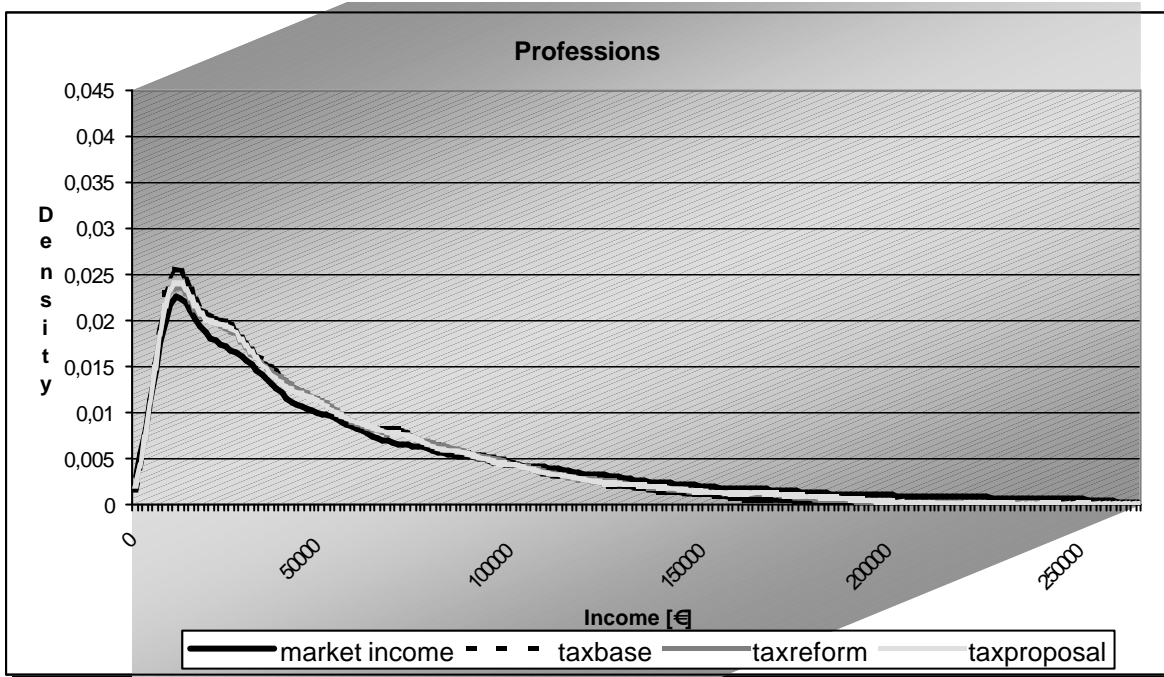
The remarkable distributional differences of the market and the tax alternatives' disposable income distribution are visible with the respective kernel density estimations in Figure 9. Higher income frequencies for the self-employed compared to the employees are even different between the professions and the entrepreneurs. The statistical measures are quantifying the differences more precisely: The self-employed disposable income is distinctly more unequally distributed than the employees' income. Since the Gini-coefficient is quite sensitive (sensitive especially to the mid range of income) this difference between the Gini-coefficients from .53 to .32 is quite remarkable (Figure 10a). Almost no difference is given in between the self-employed: professions and entrepreneurs show almost the same overall inequality.

The tax reform 2000/2005 as well as the "Karlsruhe proposal" lead to a stronger differentiation of the disposable income. Especially the disposable income of the entrepreneurs spreads far more widely; the Gini-coefficient rises by 8.4% (taxproposal) respective by 6.6% (taxreform). The reason behind this is the abolishment of the trade tax. There is almost no effect for employees by the tax reform; however the Gini coefficient is increased by 2.8% by the taxproposal. There are some effects for the professions in rising their income spread. Thus, both tax reform alternatives (taxreform and taxproposal) are spreading the disposable income of the self-employed even if there is no influence of the trade tax treatment.

Decile shares allow a closer look to the distribution. They show the share of total income a respective ten percent population share was able to earn. With Figure 10b and the respective Lorenz curves from Figure 10c it will become evident, that the richest ten percent in particular for the self-employed are responsible for their pronounced income inequality.

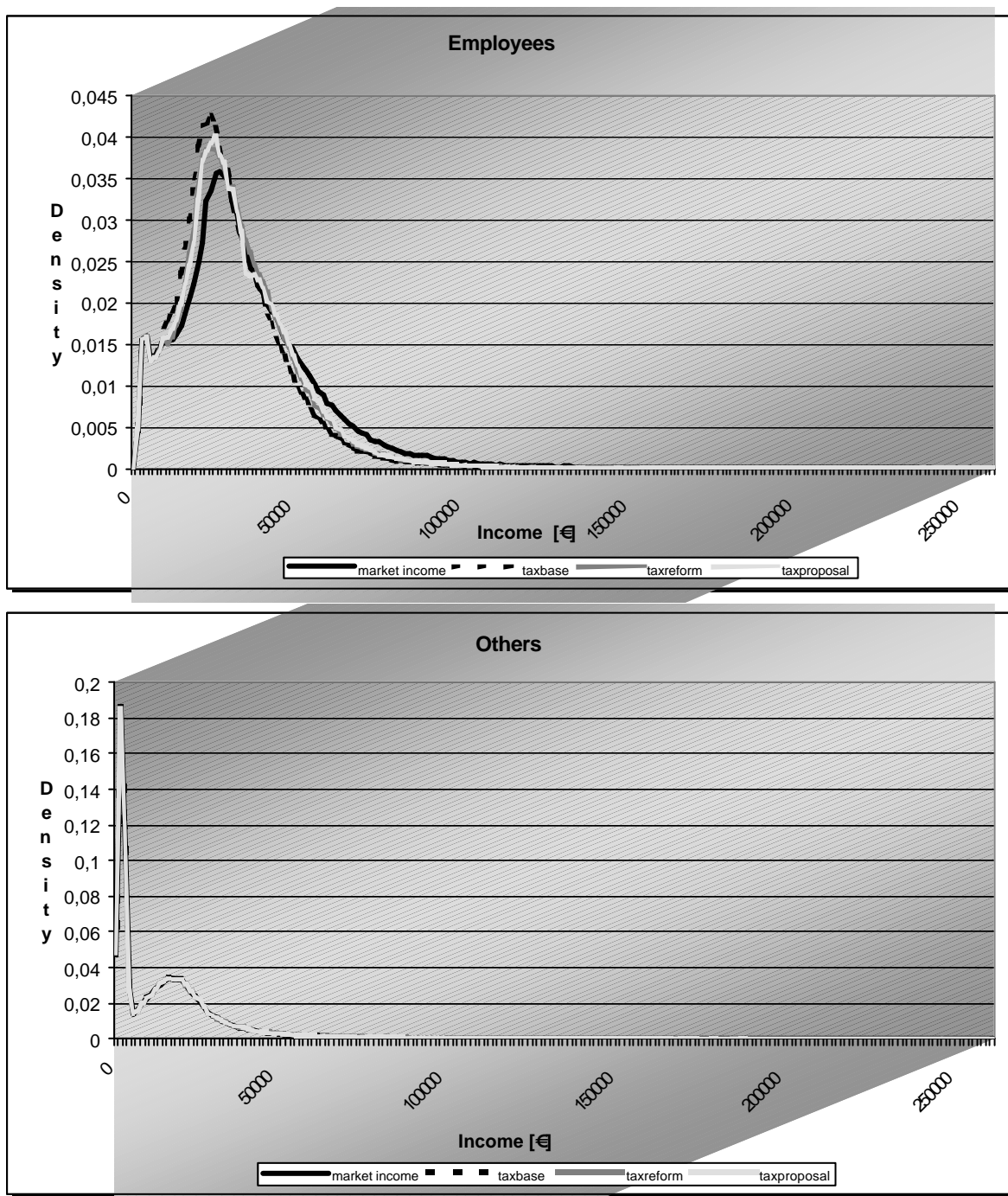
The effective tax reform as well as the "Karlsruhe proposal" in particular rise the disposable income of the richest ten percent whereas the other ninety percent – in relative terms – are diminished. The effect is more pronounced for the taxproposal than the taxreform and in particular pronounced for the entrepreneurs. And, the effects are different and of less magnitude for employees. For employees the taxreform as well the taxproposal decile changes are zero or just positive from the 3rd decile on.

Figure 9: Alternative Tax Systems in Germany – Kernel Estimates



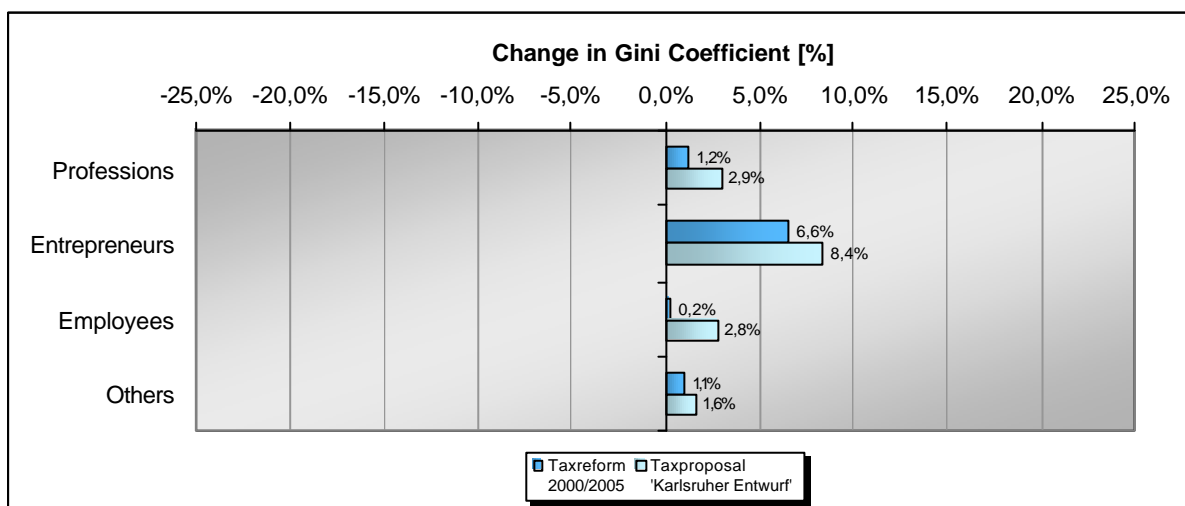
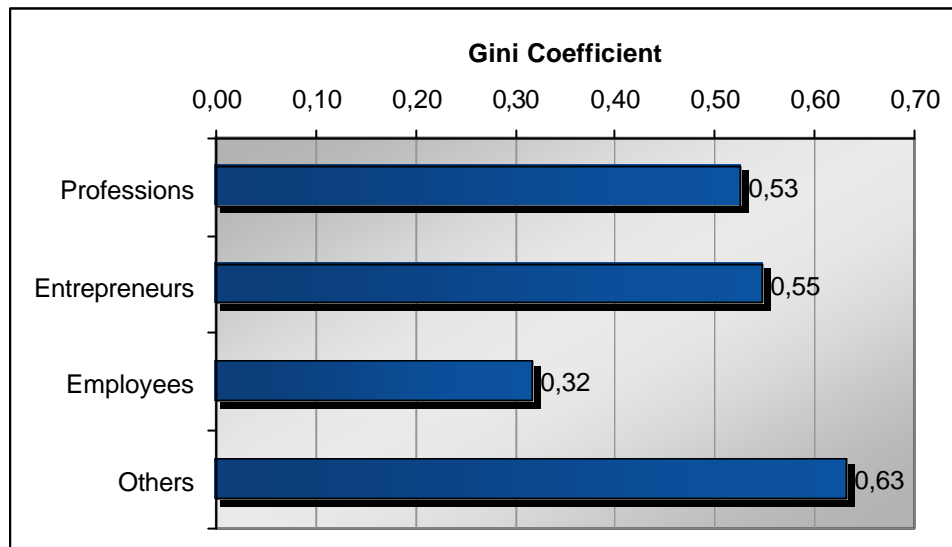
Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Figure 9: Alternative Tax Systems in Germany – Kernel Estimates (continued)



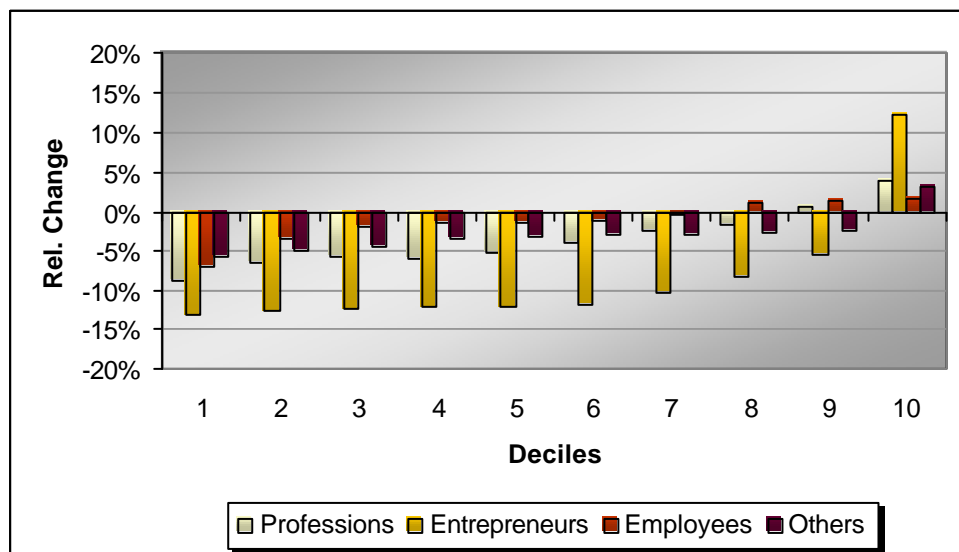
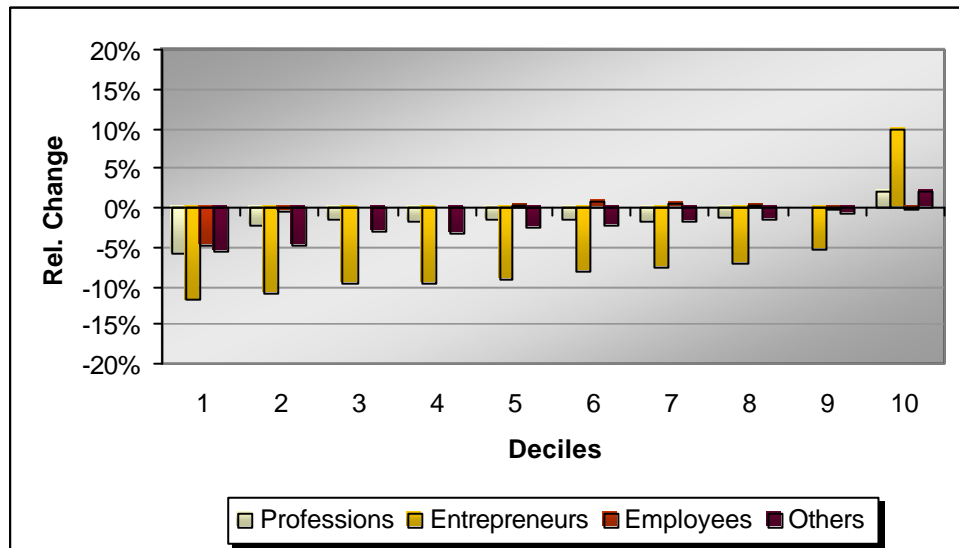
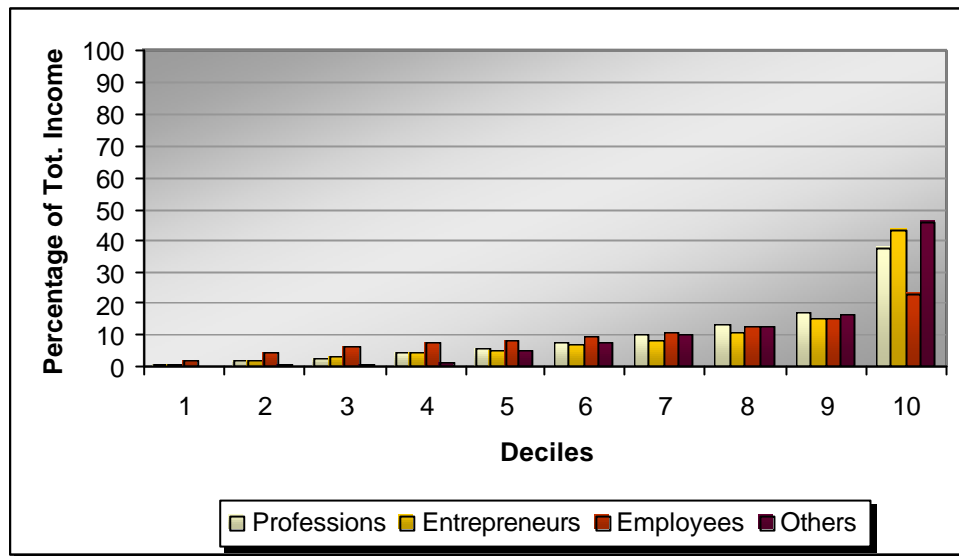
Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Figure 10a: Alternative Tax Systems in Germany – Gini-Coefficient and Relative Change in Gini-Coefficient Compared to Taxbase 1995 Occupation



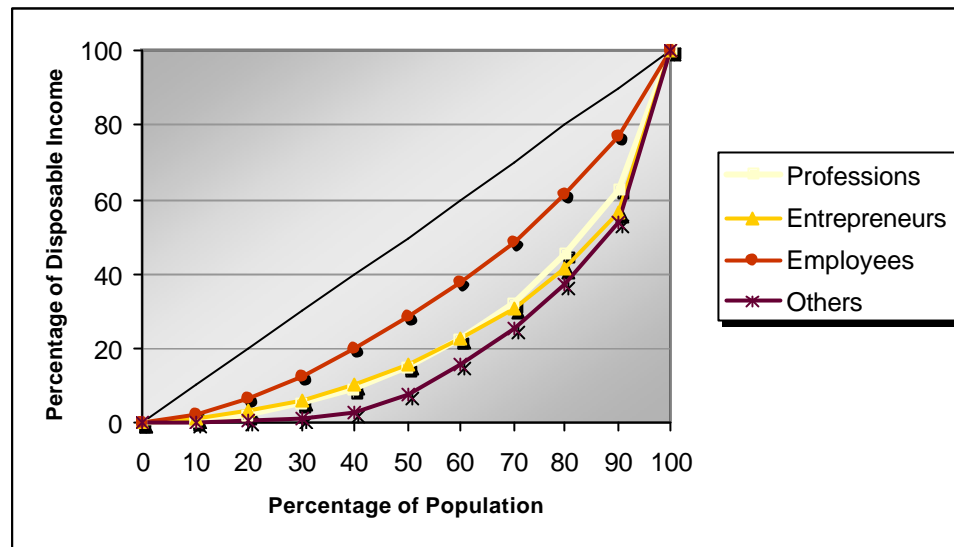
Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Figure 10b: Alternative Tax Systems in Germany – Deciles and Change in Deciles Compared to Taxbase 1995 Occupation



Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Figure 10c: Alternative Tax Systems in Germany – Lorenz-Curves in Taxbase 1995 Occupation



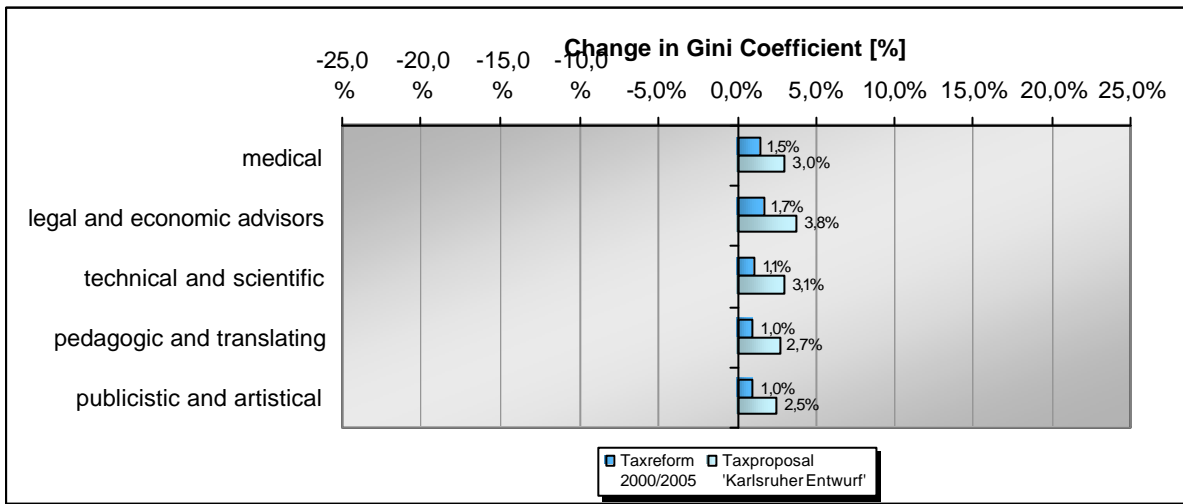
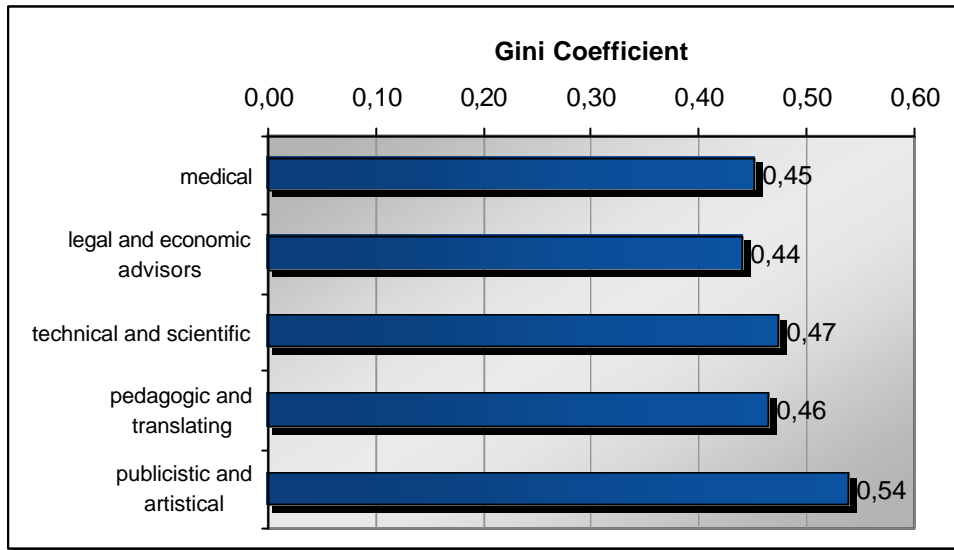
Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Professions

Again, the picture is heterogeneous within the heterogeneous group of professions (Figure 11a).

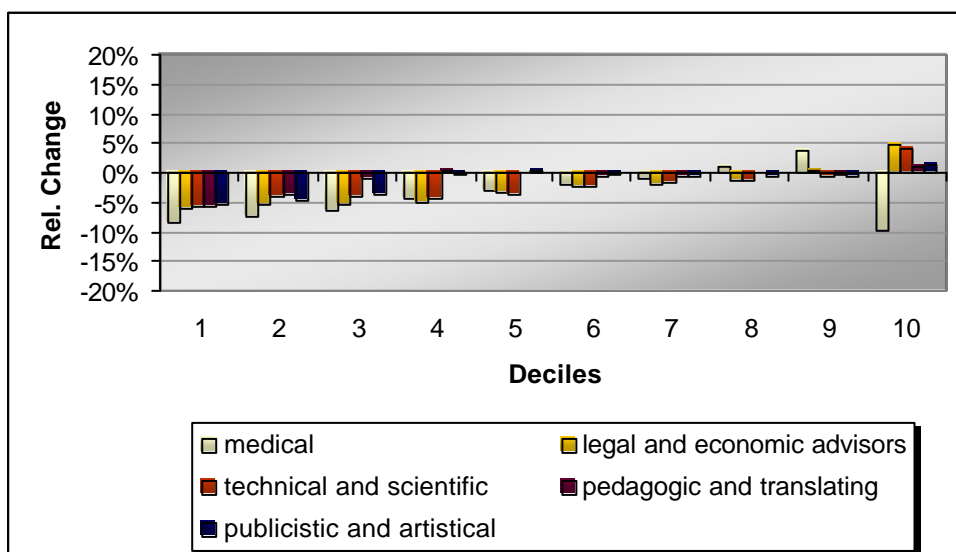
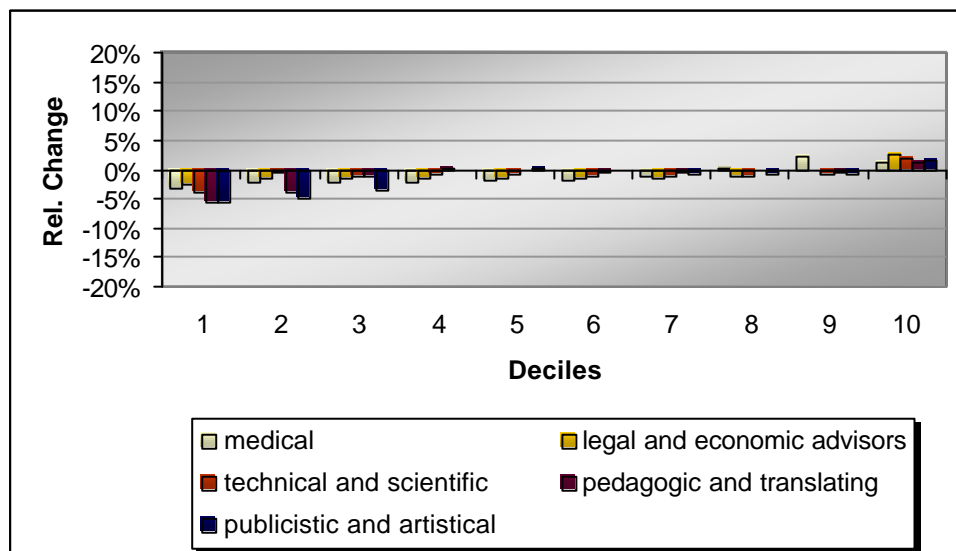
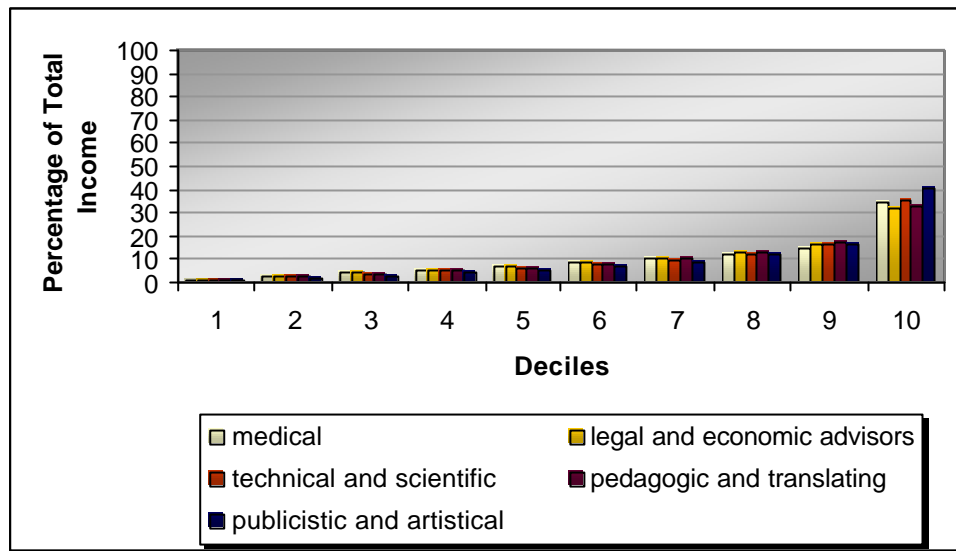
Decile shares: there are no distinct differences with regard to the decile shares of the taxbase situation for the various professional groups (Figure 11b and Figure 11c). The effects of the “Karlsruhe proposal” are more pronounced in their magnitude but in a similar tendency over all deciles compared to the tax reform 2000/2005.

Figure 11a: Alternative Tax Systems in Germany – Gini-Coefficient and Relative Change in Gini-Coefficient Compared to Taxbase 1995 Professions



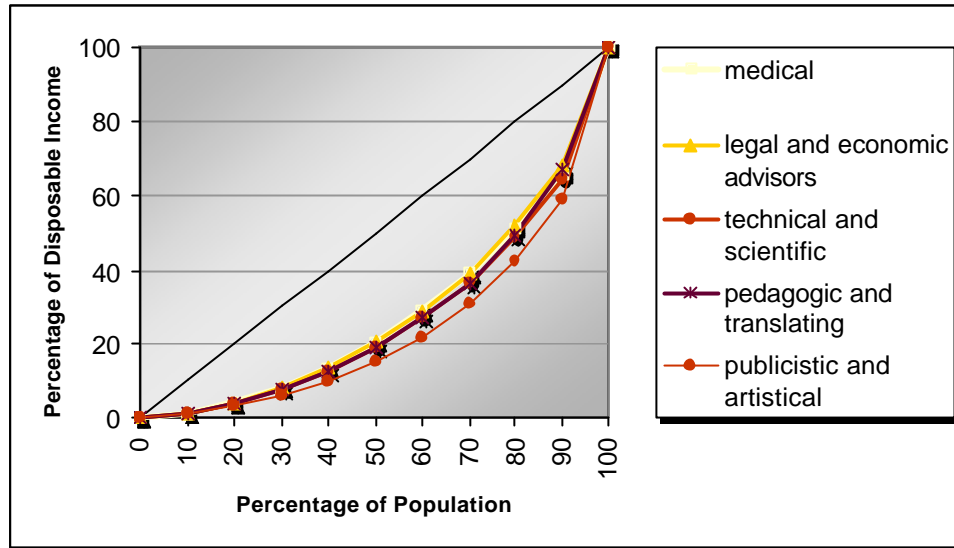
Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Figure 11b: Alternative Tax Systems in Germany – Deciles and Change in Deciles Compared to Taxbase 1995 Professions



Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Figure 11c: Alternative Tax Systems in Germany – Lorenz-Curves in Taxbase 1995 Professions



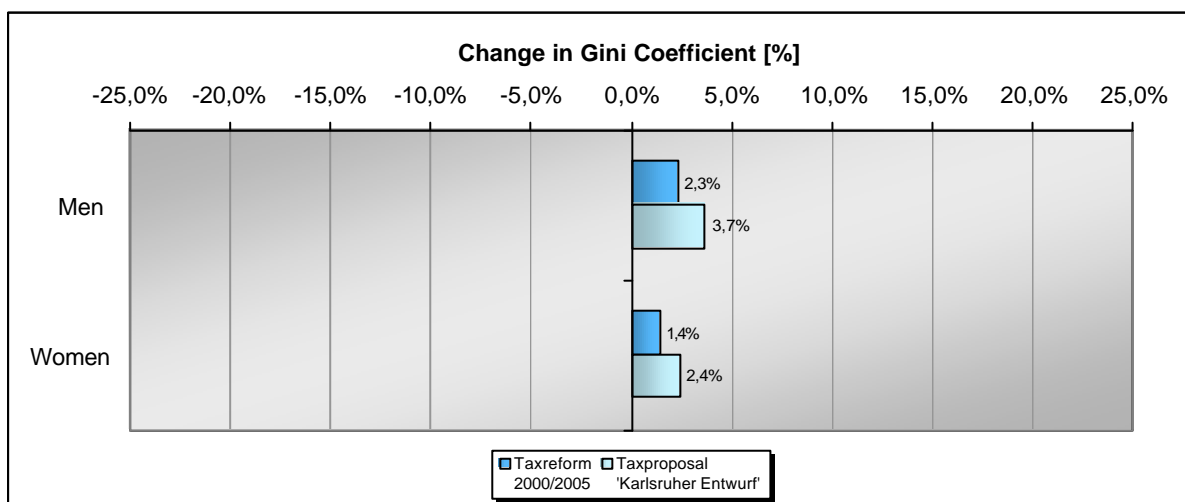
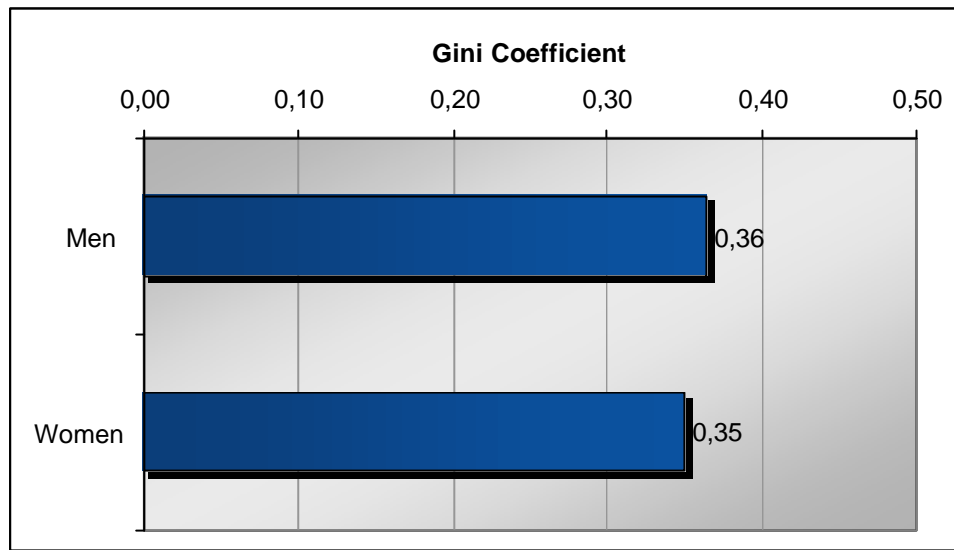
Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Gender

There is practical no difference with regard to the inequality of income between men and women (0.36 rep. 0.35). Both reform alternatives lead to a more unequal disposable income distribution with the most effects for men by the “Karlsruhe proposal” (Figure 12a).

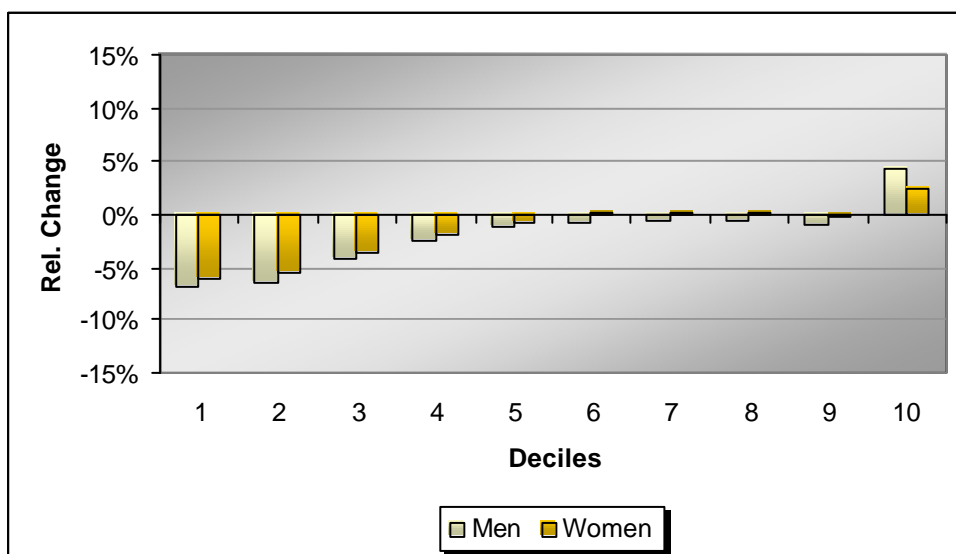
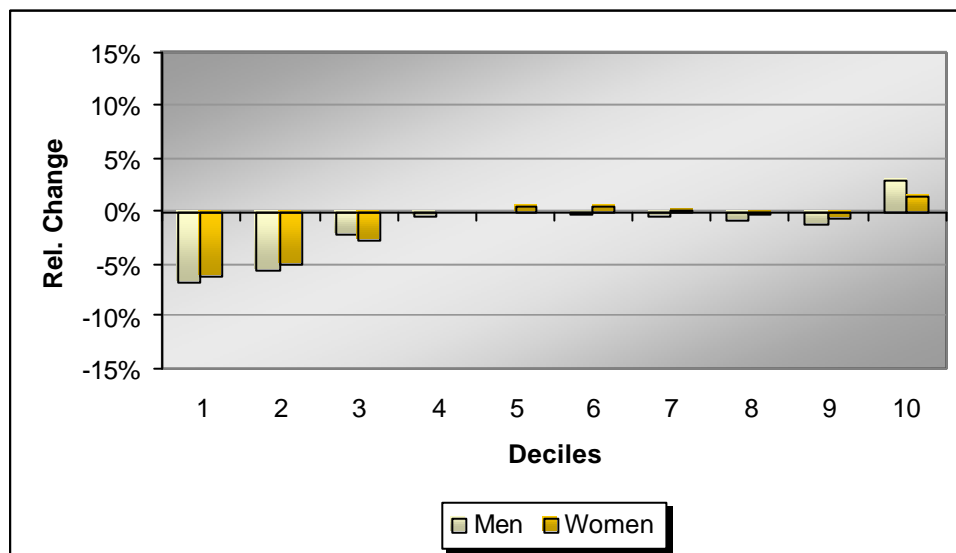
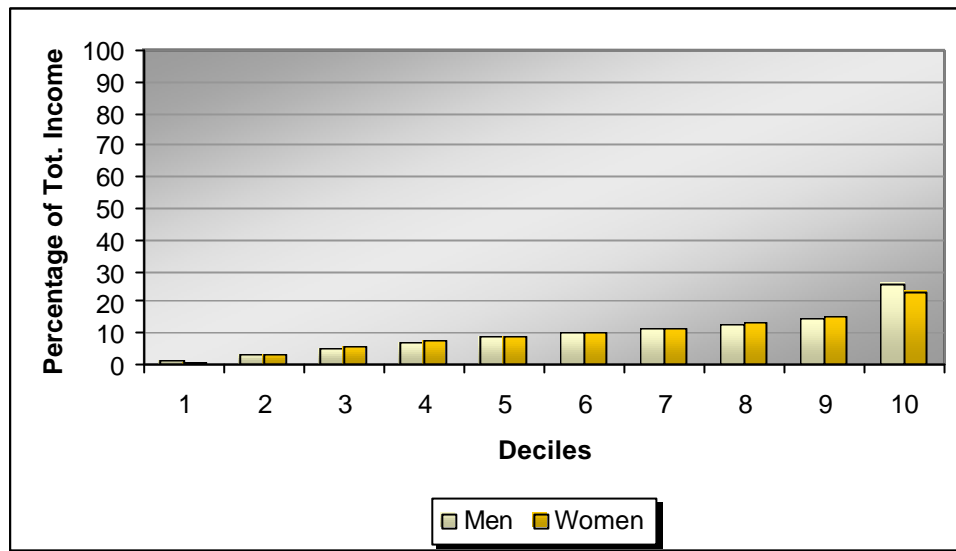
Decile shares: As measured overall by the Gini-coefficient, there are no distinct differences for the decile shares between men and women (one person tax units) (Figure 12b and Figure 12c). The richest ten percent earn more than 20% of total disposable income. The tax reform alternatives show similar impacts with particular decreasing low income shares up to the 3rd decile and some increase in the richest ten percent.

Figure 12a: Alternative Tax Systems in Germany – Gini-Coefficient and Relative Change in Gini-Coefficient Compared to Taxbase 1995
Gender



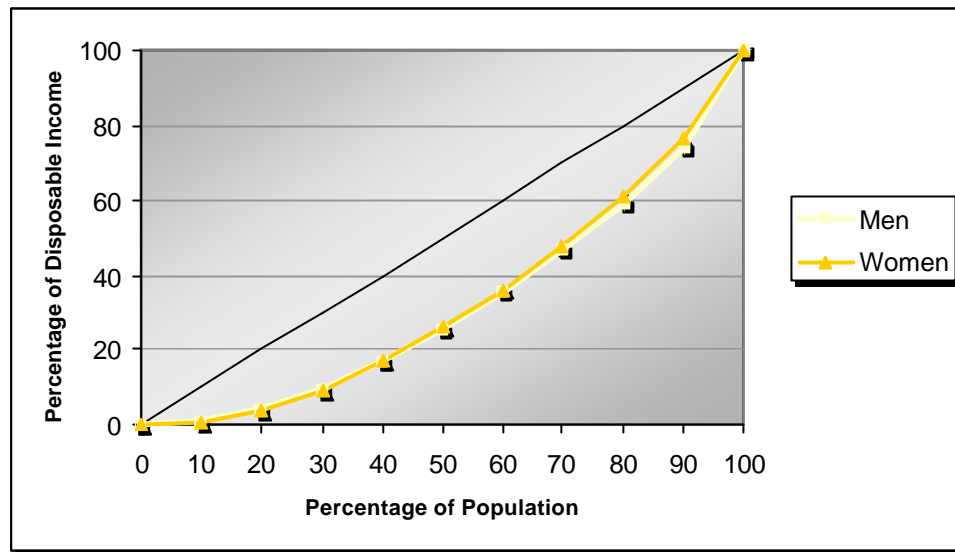
Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Figure 12b: Alternative Tax Systems in Germany – Deciles and Change in Deciles Compared to Taxbase 1995 By Gender



Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Figure 12c: Alternative Tax Systems in Germany – Lorenz-Curves in Taxbase 1995 Gender



Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

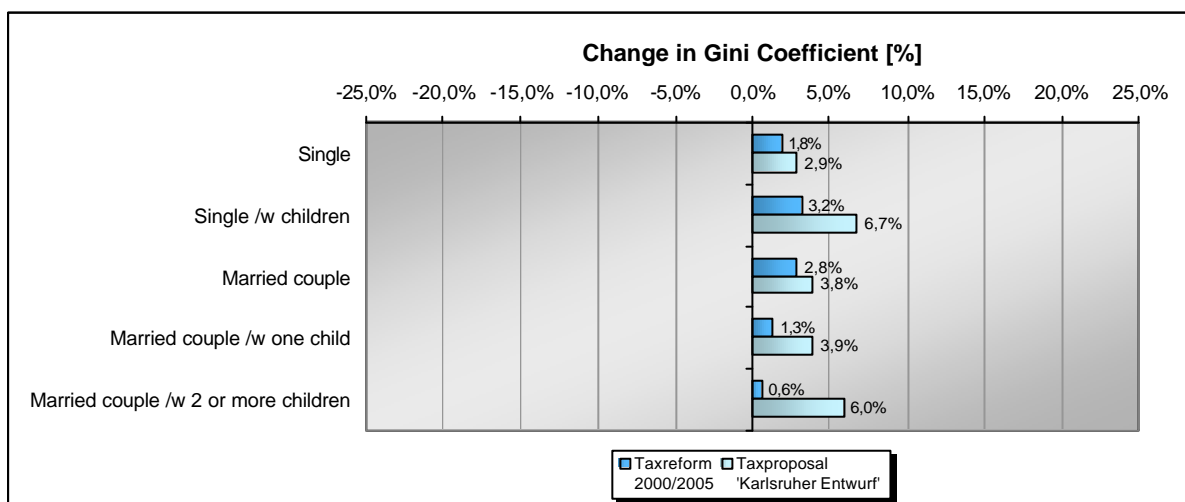
Family type

Under the former taxbase the disposable income is most unequally distributed for singles and married couples without children. More equally distributed are the incomes of families with children (Fig. 13a).

Remarkably for all family-types both tax reform alternatives increase income inequality. Most for singles with children, the respective reform instruments alter the distribution of the disposable income to more inequality.

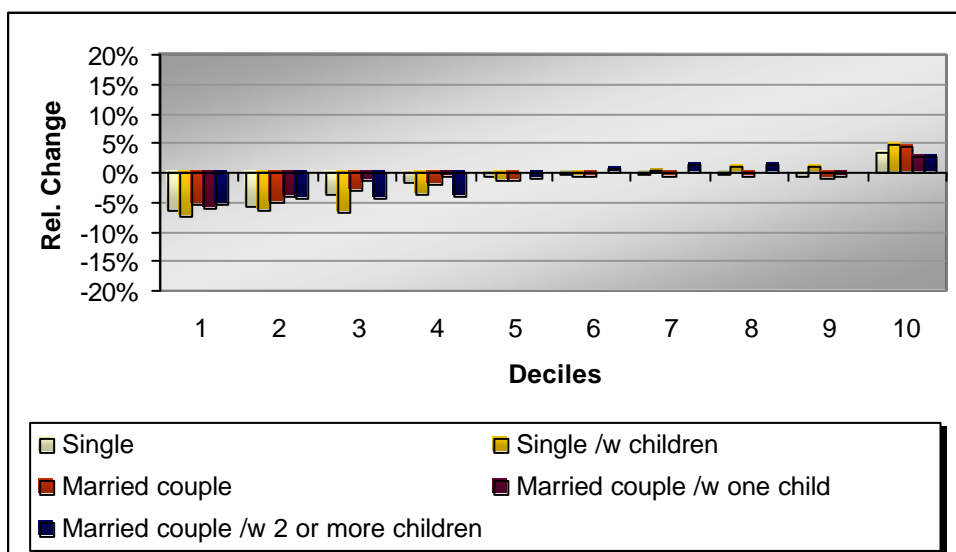
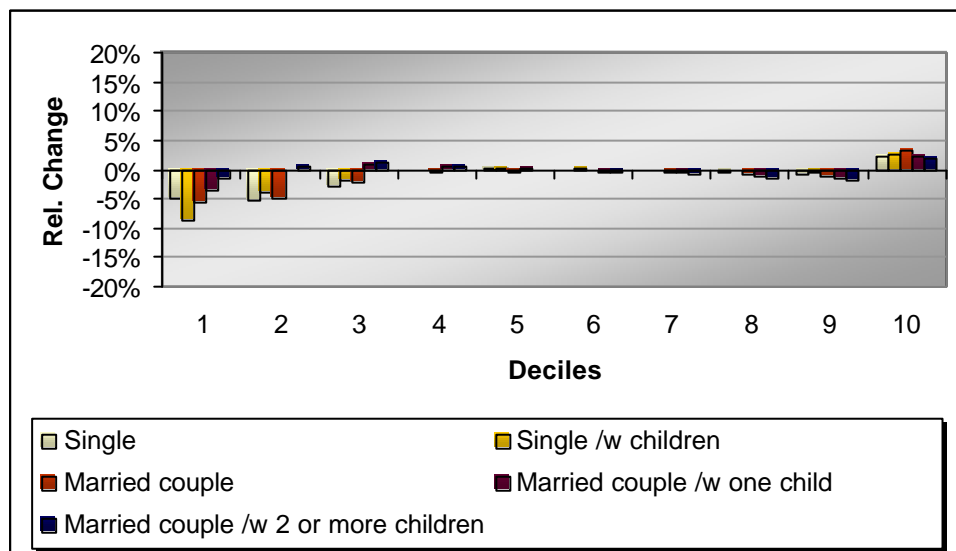
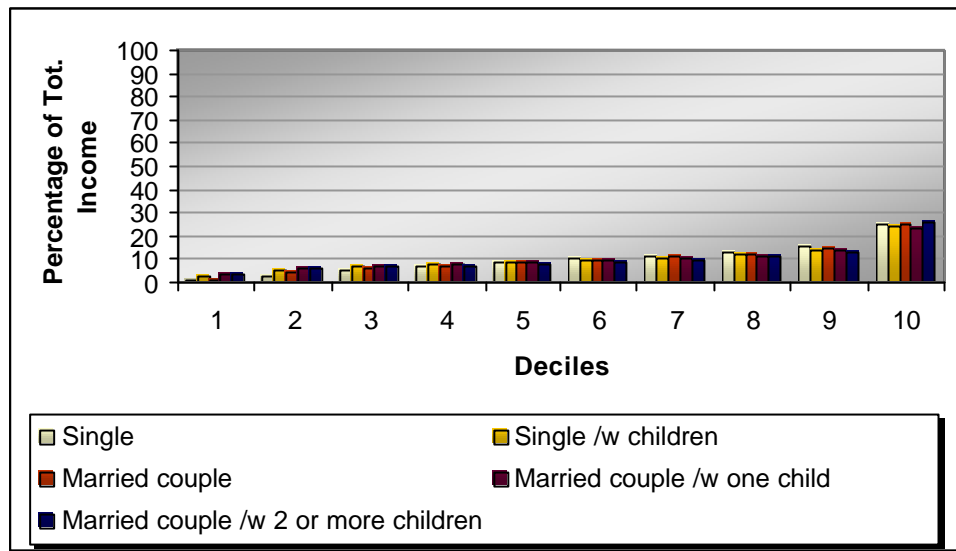
Decile shares: Deepening the distributional family type figure by the analysis of decile shares the richest ten percent of all family types hold more than 20% of the respective total income (Figures 13b and 13c). The tax reform 2000/2005 as well as the “Karlsruhe proposal” show a similar decile share picture with diminishing importance of the lowest three to four poorest population deciles and increasing importance of the richest ten percent.

Figure 13a: Alternative Tax Systems in Germany – Gini-Coefficient and Relative Change in Gini-Coefficient Compared to Taxbase 1995 Family-Type



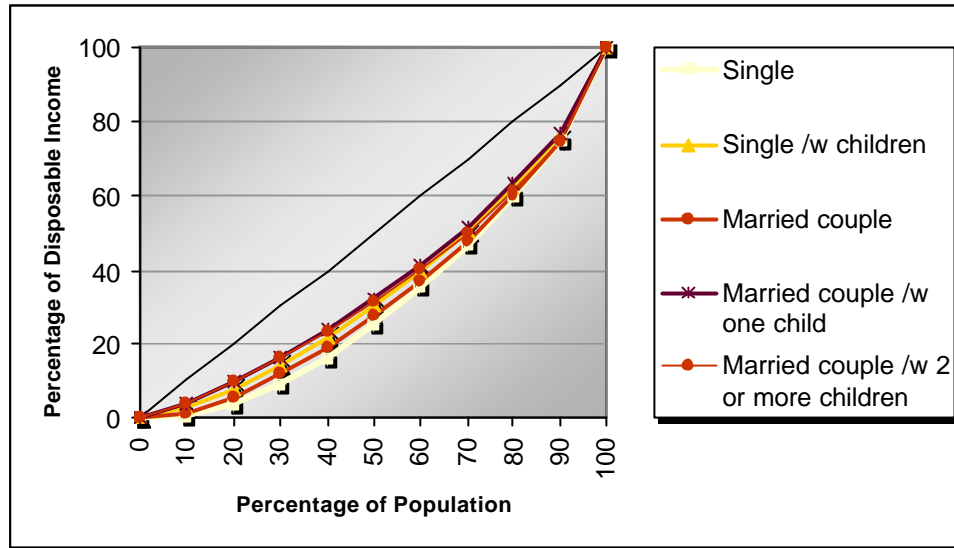
Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Figure 13b: Alternative Tax Systems in Germany – Deciles and Change in Deciles Compared to Taxbase 1995 Family-Type



Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Figure 13c: Alternative Tax Systems in Germany – Lorenz-Curves in Taxbase 1995 Family-Type



Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

8.5 Decomposition of inequality: The contribution of subgroups to overall inequality - Impacts of the tax reform alternatives

This section further deepens the distributional analysis by a decomposition of inequality asking for the contribution of each of the socioeconomic group's breakdown inequality to the overall inequality of the respective socioeconomic group.

Such a decomposition is available via a class of additively decomposable inequality measures (Shorrocks 1980, 1984) with

$$(2) \quad I_{\text{total},c} = I_W + I_B = \sum_g I_{Wg} + I_B = \sum_g (n_g/n) (\mu_g/\mu)^c I_c(y_g) + I_B$$

where I_W is within and I_B is between group inequality, g is the group index, μ is the overall respective group mean, n is the number of observations, $I_c(y_g)$ is the group inequality index dependent on group's incomes y_g ; the group weights $w_g = (n_g/n) (\mu_g/\mu)^c$ only sums to unity when $c = 0$ or $c = 1$. The only class of inequality measures that satisfies the principle of scale invariance when comparing distributions with different means, and that ensure that the decomposition procedure is valid for arbitrary specifications of the partition, belongs to the generalised entropy class with

$$(3) \quad I_c = (1/n) 1/[c-(c-1)] \sum_i [(y_i/\mu)^c - 1] \quad c \neq 0 \text{ or } 1.$$

We further use the Theil index as the overall and group inequality index which is given for $c = 1$ and applying the rule of de l'hospital by

$$(4) \quad I_1 = 1/n \sum_i (y_i/\mu) \log(y_i/\mu).$$

Thus, the Theil inequality index decomposition by equations (2) and (4) provides additive group specific inequality contributions. We finally use group specific inequality shares (%) as a group specific percentage of I_w , the overall within group inequality part. The between group inequality share (%) is calculated as I_B as a percentage of the overall inequality index $I_{total,c}$.

Discussing the impacts results

Now, let us answer the question: How much of the overall inequality can be 'explained' by the specific breakdowns of a socioeconomic group under consideration? The answer is given by the above decomposition of the overall inequality into the *inequality within subgroups* and the *inequality between these subgroups*.

Table 8 provides for all our socioeconomic groups and for the taxbase, taxreform and the taxproposal the numerical overview for the decomposition of inequality with inequality shares for all subgroups, the within and the between share for the entire respective socioeconomic group.

**Table 8: Alternative Tax Systems in Germany –
Decomposition of Inequality**

	Taxbase 1995 % ¹	Taxreform 2000/2005 % ¹	Taxproposal 'Karlsruher Entwurf' % ¹
Occupation			
Professions	7,33	6,76	6,71
Entrepreneurs	23,65	28,74	29,33
Employees	52,39	49,11	49,61
Others	16,64	15,40	15,35
<i>Within group share</i>	94,95	94,28	94,00
<i>Between group share</i>	5,05	5,72	5,60
Professions			
medical	71,89	70,70	69,82
legal and economic advisors	8,02	8,47	8,80
technical and scientific	12,66	13,08	13,44
pedagogic and translating	2,66	2,79	2,85
publicistic and artistic	4,78	4,96	5,10
<i>Within group share</i>	88,70	88,26	87,93
<i>Between group share</i>	11,30	11,74	12,07
Gender			
Men	61,63	62,47	62,92
Women	38,37	37,53	37,08
<i>Within group share</i>	99,36	99,36	99,31
<i>Between group share</i>	0,64	0,64	0,69
Family-Type			
Single	32,43	32,46	31,90
Single /w children	2,96	3,04	3,12
Married couple	28,43	28,85	28,25
Married couple /w one child	11,80	11,80	12,02
Married couple /w two or more children	24,38	23,85	24,79
<i>Within group share</i>	80,26	81,23	80,82
<i>Between group share</i>	19,74	18,77	19,18

¹ Inequality shares of the Theil-Inequality Measure

Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

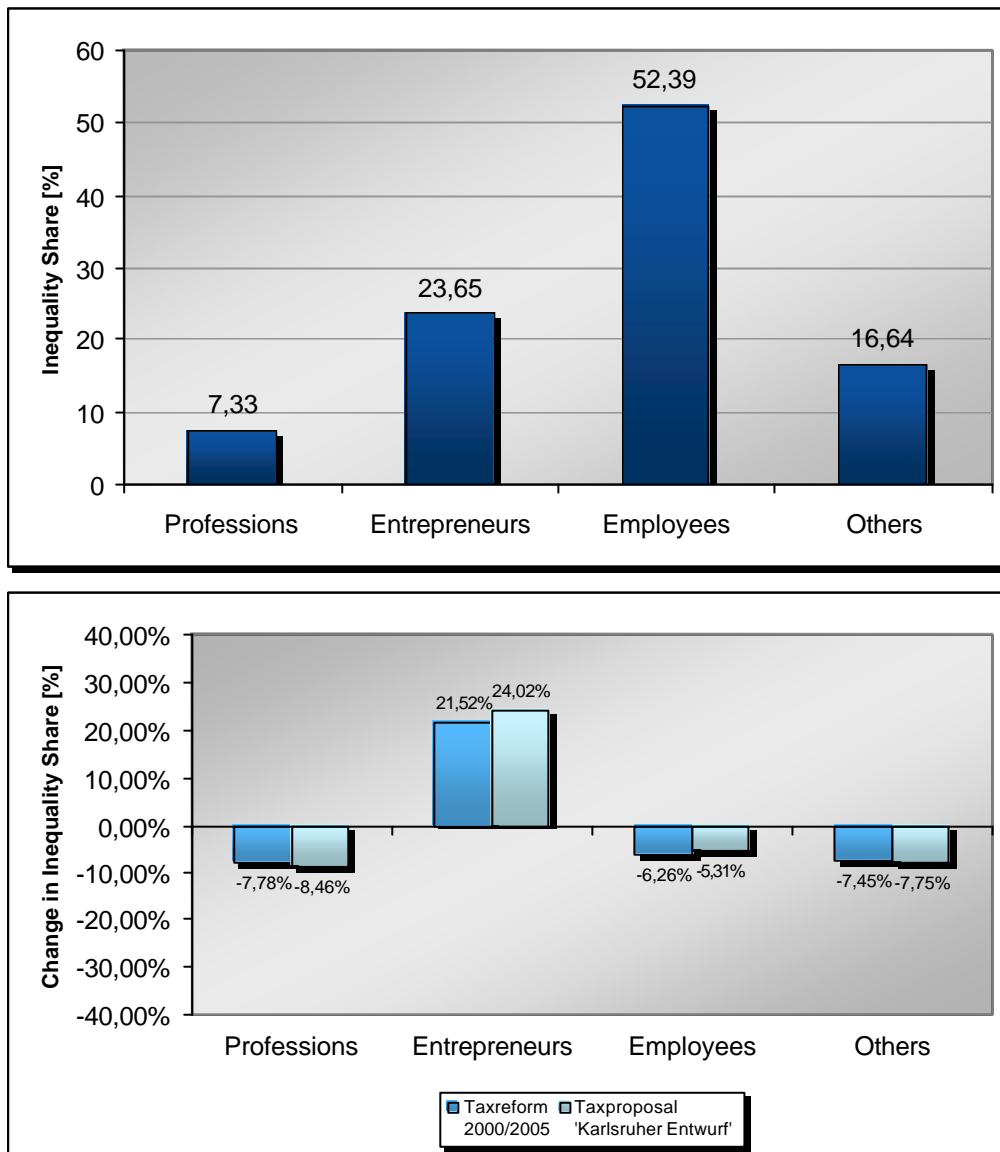
We discuss the results along the derived figures where again on the upper part the taxbase situation and on the lower part the relative differences in % to the taxreform and the taxproposal are shown.

Occupation

With respect to overall inequality the employees' inequality (also according their quantitative importance, 83% of all tax units have an predominant employee income) contribute the most by 52% with regard to the taxbase 1995 (Figure 14a). Second in line is the entrepreneurs' inequality contribution with an inequality share of 24%.

The between group inequality share of 5.05%, above all based on a comparison of subgroups mean income, shows not a distinct difference in the different subgroups' shapes of distribution and inequality. It is rather the within group inequality which counts by 94,95% for the overall inequality.

Figure 14a: Alternative Tax Systems in Germany – Inequality Shares in and Changes in Inequality Shares Compared to Taxbase Occupation



Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

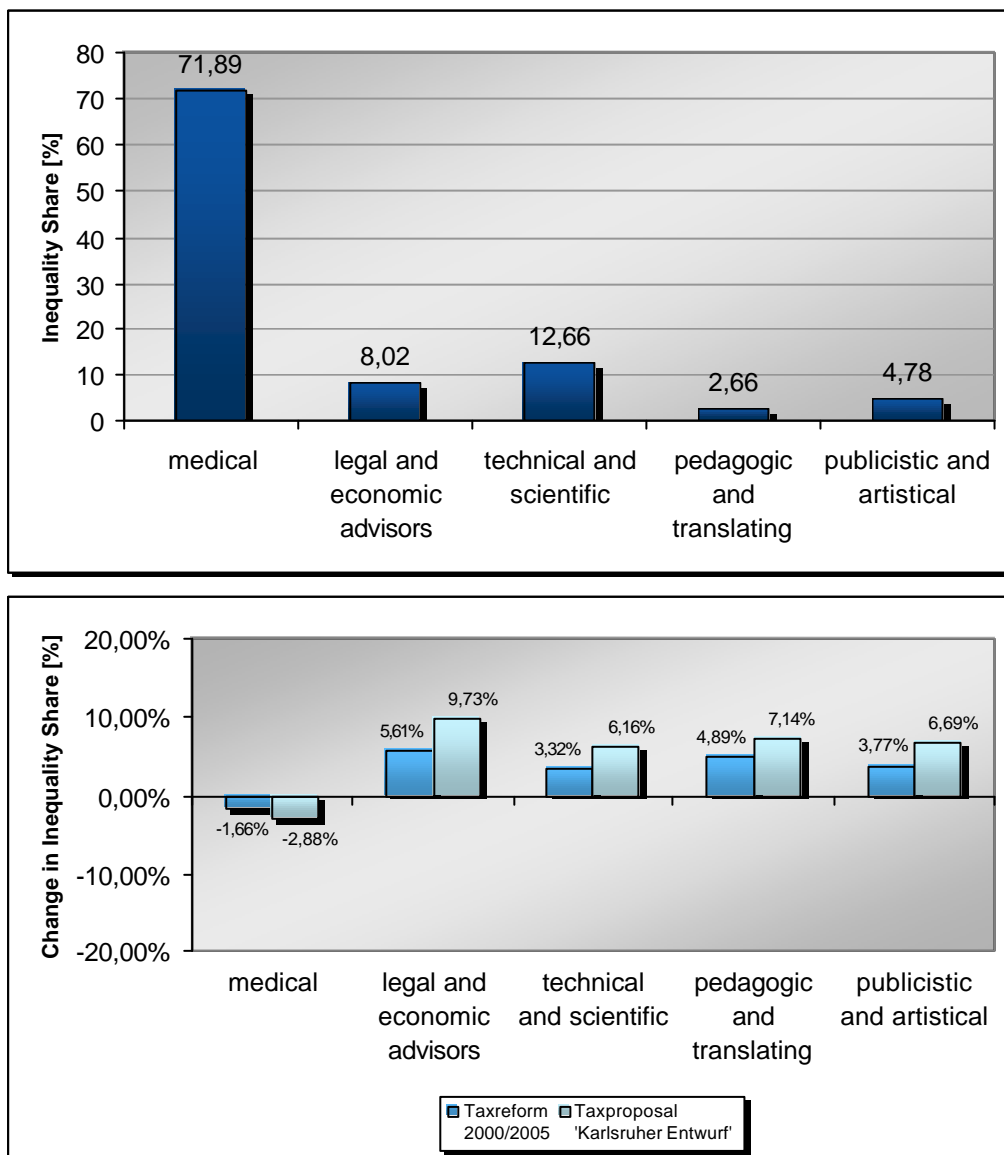
The tax reform alternatives are influencing the most the inequality shares of the entrepreneurs. Their inequality share increases more than 20% with a slightly stronger increase by the “Karlsruhe proposal”. All the other occupational groups’ impacts result in an equally sized decrease about less than 10% each.

Professions

Within the group of professions the medical professions with 72% have an outstanding contribution to the overall inequality (Figure 14b).

The between group inequality share of 11.3% is twice as high as for the overall occupational groups. So, although the within inequality is still dominant (88,7%) the differences in the distributional shape between the professional groups here are larger than in the overall occupational groups.

Figure 14b: Alternative Tax Systems in Germany – Inequality Shares in and Changes in Inequality Shares Compared to Taxbase Professions



Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

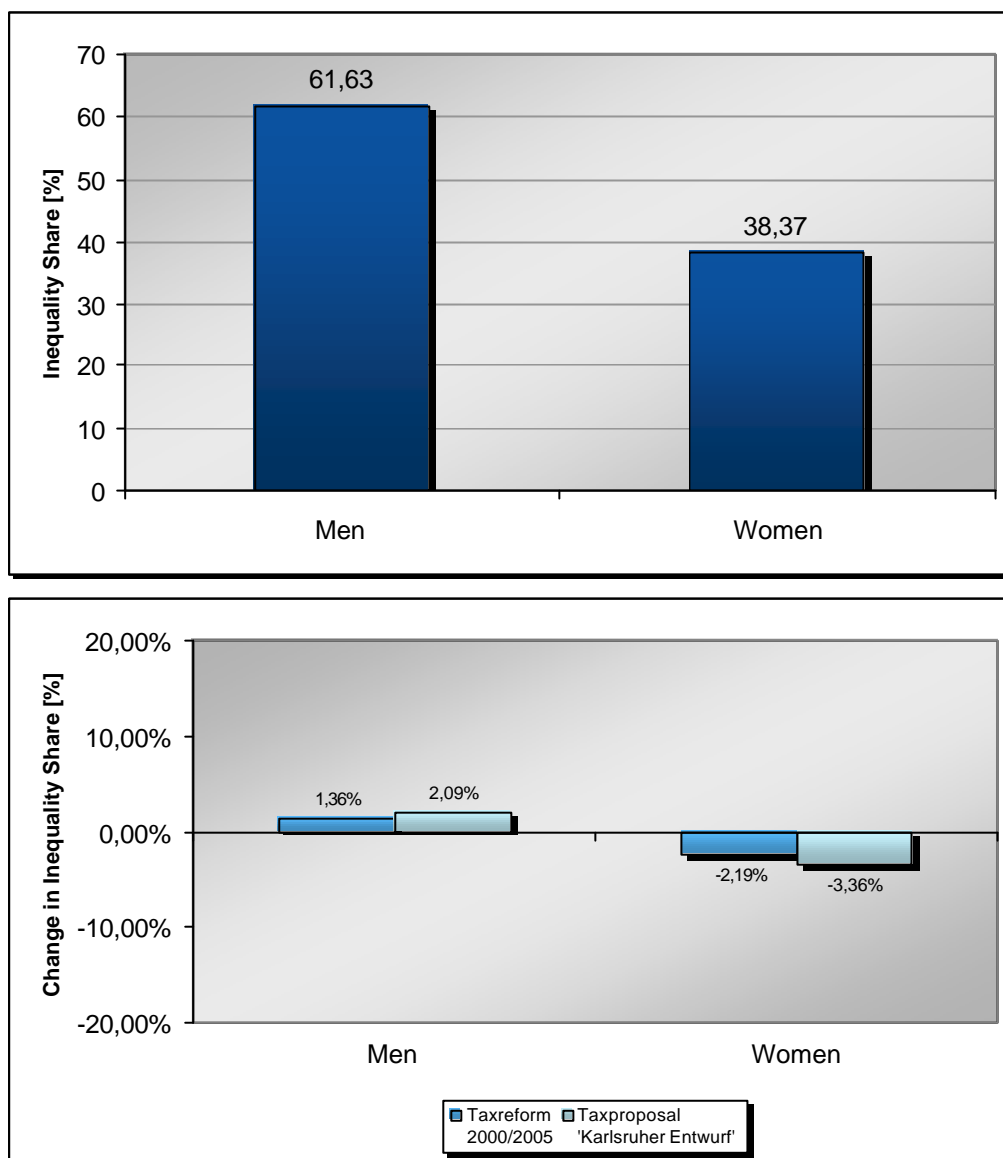
The tax reform alternatives increase the inequality contributions of all further professional groups (in a similar manner) but decrease slightly the medical professions' inequality share. There are no remarkable differences between the impacts of the taxreform and taxproposal in their effects visible here.

Gender

Here men's income inequality is dominant (taxbase 1995 inequality share 61,63%) (Figure 14c).

As we have seen by the distributional analysis both for men and women (one person tax unit) the Gini-coefficients are almost identical. Thus the between group inequality share is very low (0.64%) indeed indicating that there is (almost) no difference in the income distributional shapes between men and women.

Figure 14c: Alternative Tax Systems in Germany – Inequality Shares in and Changes in Inequality Shares Compared to Taxbase Gender



Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

The two tax reforms slightly diminish the women's income inequality share and shape with its opposite effect for men. Though this effect is a bit larger for the taxproposal, there is no real difference between the tax reform alternatives.

Family type

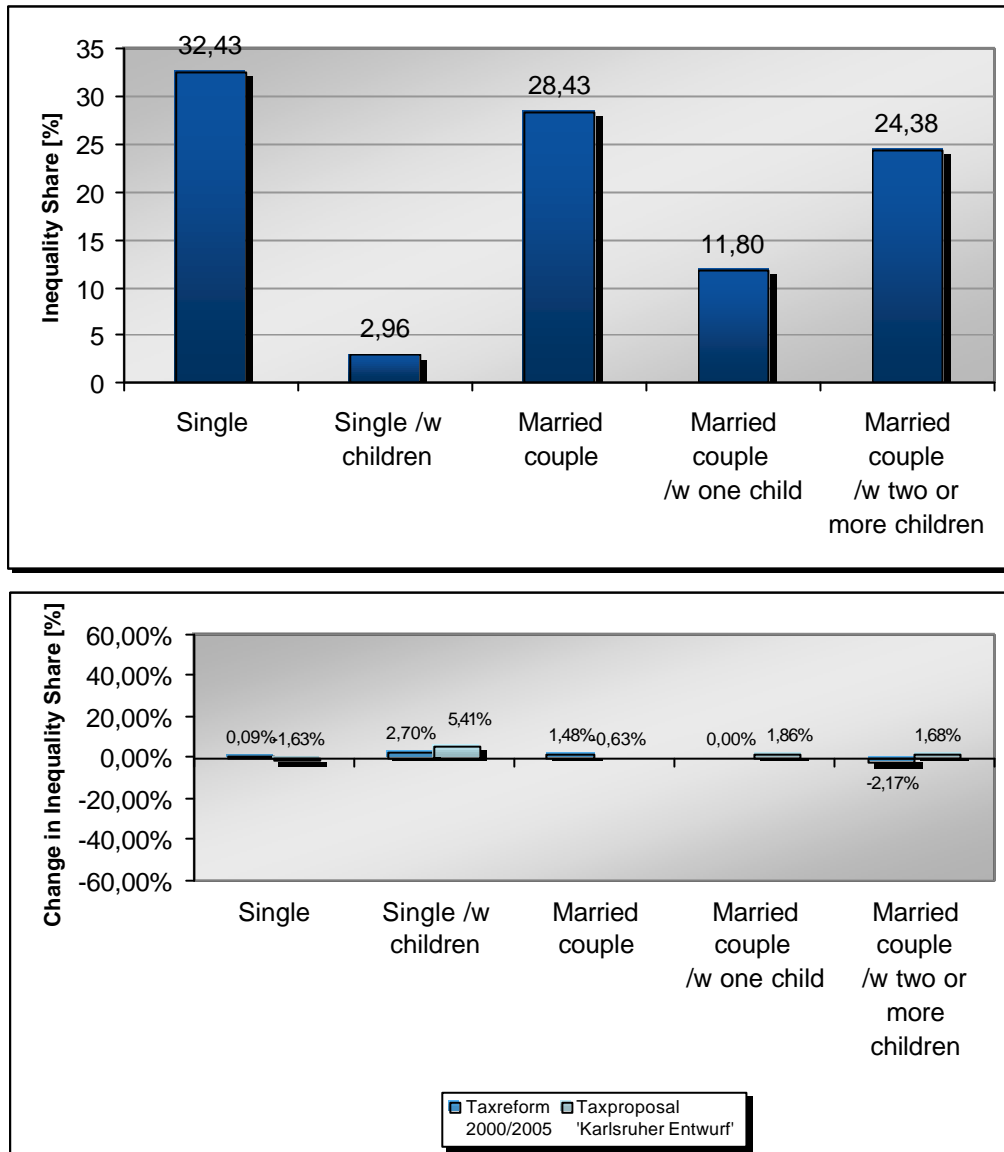
Responsible for the overall inequality when a decomposition by family types is considered are singles, married couples and married couples with two and more children (taxbase 1995,

Figure 14d). Or in other words, the disposable income distribution of single with children and married couples with one child is more homogeneous (their Ginis are also lower) and more equally distributed.

The between group inequality share for the family type decomposition with 19.35% is by far the largest one within our decomposition consideration of occupation (5.05%), professions (11.3%) and gender (0.64%) showing that the different family types indeed have a distinct different income inequality shape and distribution.

The tax reform alternatives do not show a unified picture. Though the impact amount is not distinct, the impacts of the taxreform and the taxproposal are of different signs for each family type.

Figure 14d: Alternative Tax Systems in Germany – Inequality Shares in and Changes in Inequality Shares Compared to Taxbase Family-Type



Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Altogether, the decomposition analysis via the inequality contribution of the respective subgroups to the overall inequality has further quantified the differences of the subgroups shape of distribution. There are remarkable differences in the inequality contributions within the occupational groups, within professions as an important subgroup of the self-employed, within gender and within family types where the family type shows the most heterogeneous distributions.

8.6 Redistributive impacts of the tax reform alternatives for socioeconomic groups

Our final section presents the redistributive effects of the three tax systems. As we could see in the beginning, overall redistributive impacts visible are and there are different impacts of the different tax systems. Now we ask how large and important these effects are when we consider the socioeconomic groups including their subgroups. We shall again measure the redistributive impacts with the Blackburn approach.

Table 9 provides an overview of the redistributive effects for the three tax systems and our socioeconomic groups with their subgroups.

**Table 9: Alternative Tax Systems in Germany –
Redistribution: Blackburn's R and k measures**

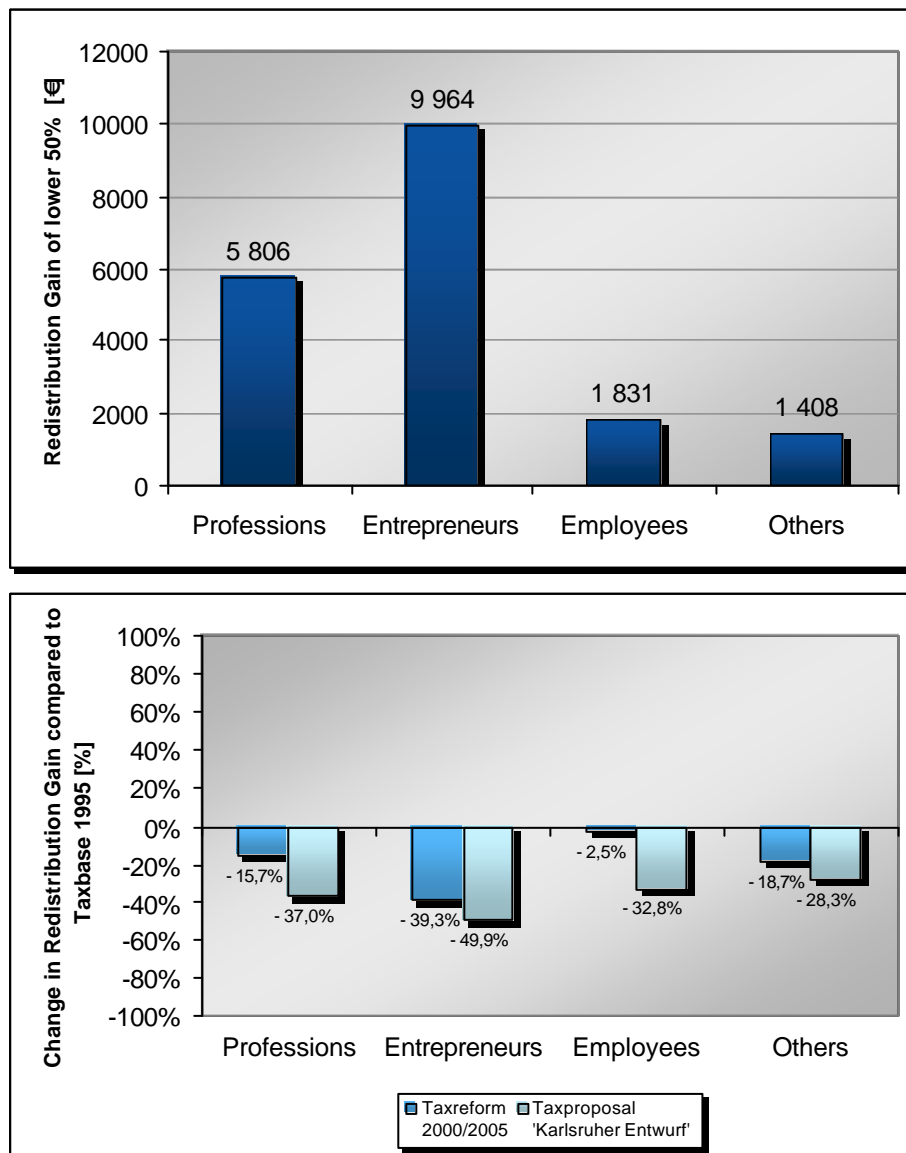
	Taxbase 1995		Taxreform 2000/2005		Taxproposal 'Karlsruher Entwurf'	
	R (%)	k (€)	R (%)	k (€)	R (%)	k (€)
All	-8,1	-2 790	-6,7	-2 316	-5,1	-1 708
Occupation						
Professions	-8,3	-5 806	-7,0	-4 896	-5,2	-3 659
Entrepreneurs	-18,4	-9 964	-11,1	-6 044	-9,2	-4 993
Employees	-5,4	-1 832	-5,3	-1 785	-3,6	-1 230
Others	-7,2	-1 407	-5,8	-1 145	-5,1	-1 010
Professions						
medical	-6,2	-6 915	-4,9	-5 430	-3,5	-3 845
legal and economic advisors	-9,3	-7 615	-7,8	-6 420	-6,0	-4 876
technical and scientific	-9,2	-6 112	-8,2	-5 424	-6,3	-4 197
pedagogic and translating	-8,6	-2 428	-7,7	-2 169	-6,1	-1 723
publicistic and artistic	-10,2	-2 971	-9,0	-2 643	-7,4	-2 170
Gender						
Men	-9,7	-2 331	-8,1	-1 934	-7,1	-1 695
Women	-7,3	-1 487	-6,3	-1 287	-5,6	-1 145
Family-Type						
Single	-8,8	-1 938	-7,5	-1 643	-6,7	-1 480
Single /w children	-9,3	-2 336	-7,4	-1 852	-5,3	-1 332
Married couple	-10,4	-4 393	-8,5	-3 586	-7,8	-3 291
Married couple /w one child	-9,5	-4 465	-8,8	-4 135	-7,4	-3 475
Married couple /w two or more children	-9,8	-4 852	-9,4	-4 673	-6,3	-3 137

Source: Income Tax Statistic 1995, 10% Sample (n=3 mio.), own computations

Occupation

The most redistributive effect within the occupational groups under the taxbase 1995 system is given for entrepreneurs (taxbase 1995, Table 9 and Figure 15a). In reducing inequality the tax system transfers from every entrepreneur above the median income $k=9\,964\text{ €}$ to the entrepreneurs below the median income. Both, in absolute terms as well as a percentage of the mean market income ($R=-18,4\%$), this is the largest amount and percentage and thus the largest redistributive effect of all the occupational groups. Next in line are professions with $k=5\,806\text{ €}$ and $R=-8,3\%$. Thus, the self-employed with their higher income carry the highest burden, both in absolute and relative terms.

Figure 15a: Alternative Tax Systems in Germany – Redistribution (k-Measure) and Changes Compared to Taxbase Occupation



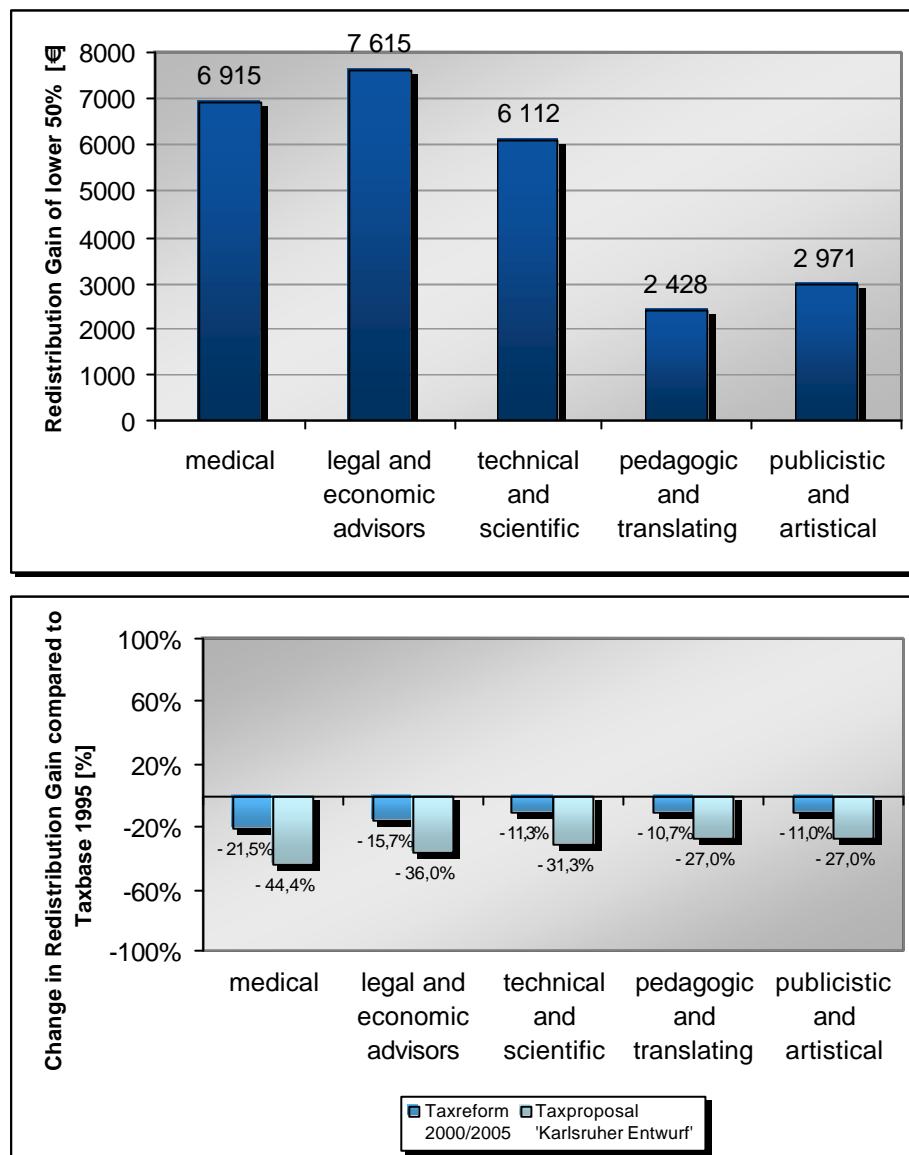
Source: Income Tax Statistic 1995, 10% Sample (n=3 Mio.), own computations

The tax reform alternatives affect the redistribution quite differently. Both systems decrease the 1995 redistributive impact, but by a different magnitude. For all occupational groups the “Karlsruhe proposal” reduces the taxbase redistribution the most with the smallest redistributive impact ranging from professions ($k=-3\,659$; $r=-3,2\%$) via employees ($k=-1\,230\text{ €}$ $R=-3,6\%$) to entrepreneurs ($k=-4\,993\text{ €}$ $R=-9,2\%$). Thus, the tax reform – and more pronounced the tax proposal – alters the redistribution the most for the self-employed (professions and entrepreneurs) with the most changes for the group of entrepreneurs.

Professions

The taxbase 1995 system situation for the professions’ subgroups is as follows: the largest redistribution (by the k amount) is given for legal and economic advisors with $k=-7\,615\text{ €}$ which is $R=-9,3\%$ of their pre tax mean income (Table 9 and Figure 15b). The picture is different if we regard the percentage value: due to the widely spread means of the five professional groups, the percentage base can be quite low resulting in a larger relative R measure. So, journalist and artist professions have a redistributive impact of $R=-10,2\%$ but in absolute terms by $k=-2\,971\text{ €}$

Figure 15b: Alternative Tax Systems in Germany – Redistribution (k-Measure) and Changes Compared to Taxbase Professions



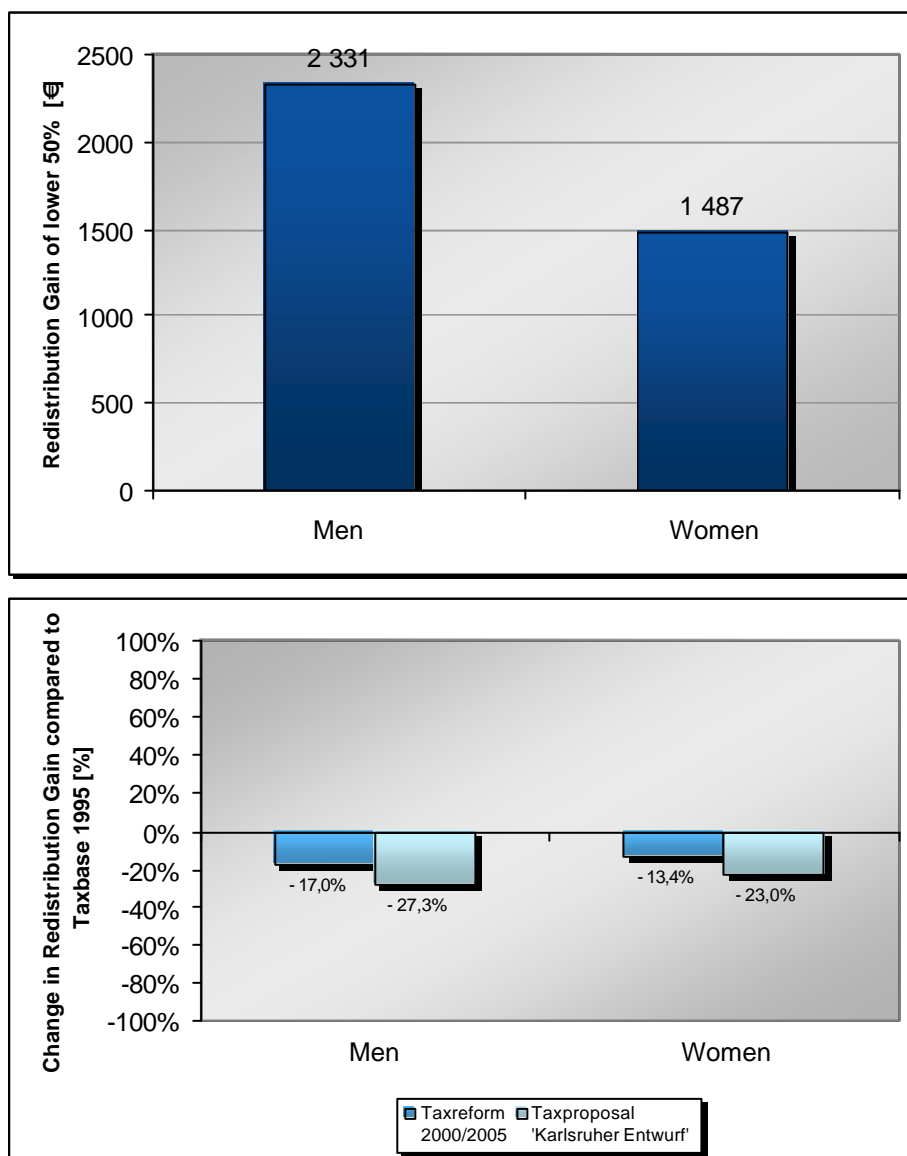
Source: Income Tax Statistic 1995, 10% Sample (n=3 Mio.), own computations

As in the occupational group the further professions' subgroup redistribution changes follows a similar picture with the least redistributive impacts by the "Karlsruhe proposal" followed by the taxreform and lastly, with the most redistributive impact, the taxbase 1995 system. According to the absolute values the "Karlsruhe proposal" has the highest impact on the medical professions (compared to the taxbase the redistributive amount is diminished by 44,4%).

Gender

Factual incidence shows some different redistributive effects for men ($k=-2\,331$ € $R=-9,7\%$) and women ($k=-1\,487$ € $r=-7,3\%$) (note: only one-person-tax-unit can be considered here). A higher mean disposable income for men (19 455 €) than for women (17 237 €) and the progressiveness of the taxbase system again is driving the redistributive differences (Table 9 and Figure 15c).

Figure 15c: Alternative Tax Systems in Germany – Redistribution (k-Measure) and Changes Compared to Taxbase Gender



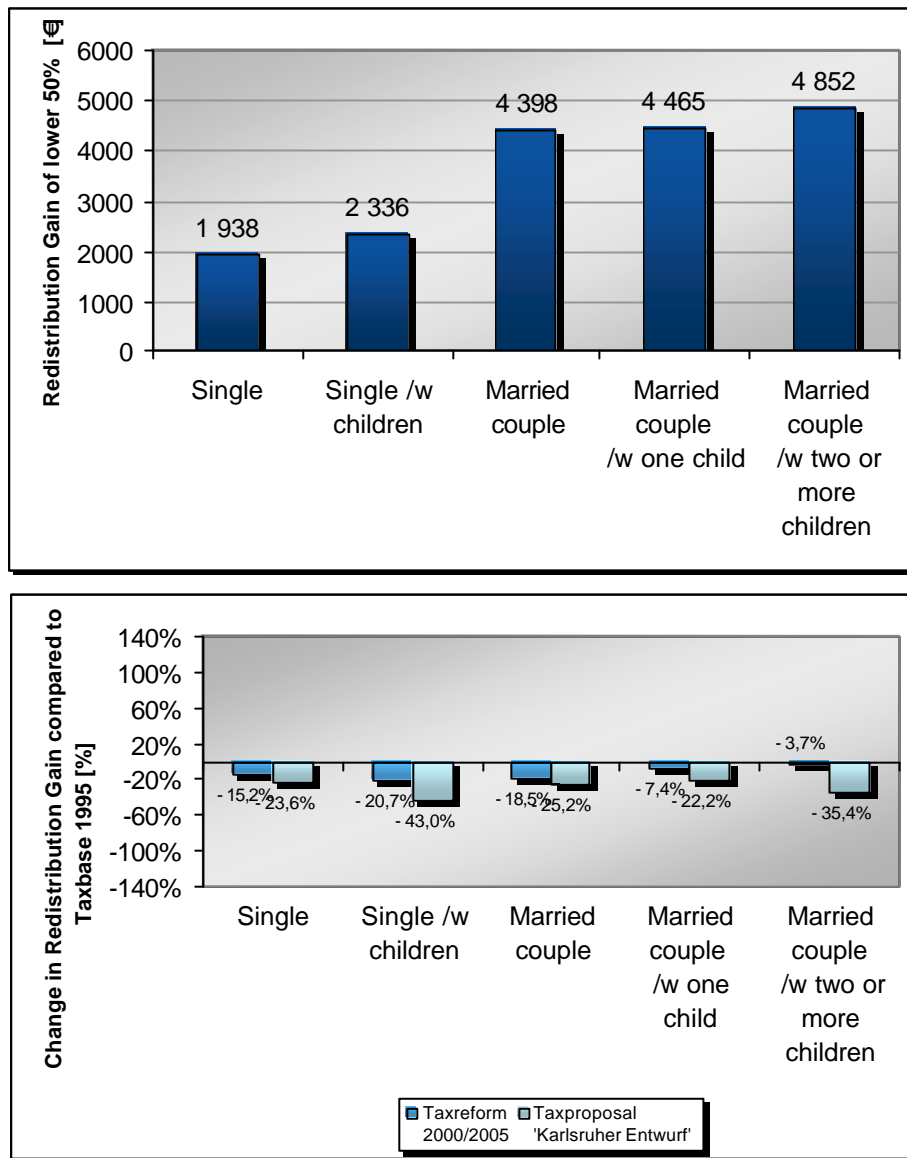
Source: Income Tax Statistic 1995, 10% Sample (n=3 Mio.), own computations

Regarding the changes due to the taxreform and the taxproposal, again the taxreform results in a higher redistribution than the taxproposal with an effect for men by $k=-1\,695\text{ €}$ ($R=-7,1\%$) and for women by $k=-1\,145\text{ €}$ ($R=-5,6\%$).

Family type

Regarding the family type, the redistributive impacts of the German taxbase system 1995 are different for singles and married couples and also differ according to the child-situation. The necessary amount every unit above the median had to transfer to the units below the median to achieve the same distributional measure before and after taxes is highest for married couples and even higher when families have children. This is naturally imposed by the child allowances: Table 9 and Figure 15d, however, provide the resulting redistribution.

Figure 15d: Alternative Tax Systems in Germany – Redistribution (k-Measure) and Changes Compared to Taxbase Family-Type



Source: Income Tax Statistic 1995, 10% Sample (n=3 Mio.), own computations

When we have a look to the taxreform and taxproposal impacts, the smallest redistributive changes for any family type compared to the taxbase is given by the “Karlsruhe proposal”. Thus, the taxreform again is more redistributive than the taxproposal. Note, that the child-effect is more pronounced within the “Karlsruhe proposal”.

9 Conclusions

Concern

This paper quantifies the distributional and redistributional impacts of the current new German taxreform and the “Karlsruhe proposal” as a prominent discussed alternative. Again the microsimulation instrument – here our microsimulation model MICSIM with its distributional program subpackage - proved to be a particularly suitable instrument for distributional analyses based on a representative sample. A demanding micro data base is needed. For the first time in Germany we were able to use an outstanding data base for our microsimulation analyses: a 3 million sub sample of the Income Tax Statistic in its current 1995 micro level version. This data base is outstanding for two reasons: firstly with regard to the high degree of details for all the tax items, and secondly, with regard to covering the total income (tax) population with its self-employed in particular. Thus the groups of self-employed, (liberal) professions, entrepreneurs and the employees could be analysed with the help of a qualified database. Further socioeconomic groups we consider are gender and the family type. Though the discussion of the single taxreform alternatives have shown the differences in the taxation structure, only the microsimulation analysis could reveal the resulting actual effects for the population and their subgroups.

Overall Mean Effects

Overall, the taxpayers’ burden is relieved by approximately 60 billion € in both reform alternatives (taxreform and taxproposal). Main winners are families with children (slightly stronger within the “Karlsruhe proposal”). Next winners compared to the taxbase situation are entrepreneurs because of the explicit trade tax consideration within the actual taxreform 2000/2005, respectively because of the total cancellation of the trade tax within the “Karlsruhe proposal”.

Although couples without children win compared to the taxbase situation, however, they loose when the “Karlsruhe proposal” (compared to the taxreform 2000/2005) is regarded. The reason here is the cancellation of the splitting advantage (‘Splitting Vorteil’) which lowers the tax burden because only half of both incomes is due to the tax tariff.

Distributional and Redistributional Results

Overall the new German taxreform as well as the “Karlsruhe proposal” result in no distinctive distributional and redistributional impacts. However, there are remarkable impacts of the different alternatives when the analysis is deepened and single socio-economic groups are considered. We see different Gini-coefficients for the taxbase situation as well as for the tax reform alternatives. The tax reform 2000/2005 and the “Karlsruhe proposal” show similar tendencies in the sign of the respective effects, however, the “Karlsruhe proposal” impacts are more pronounced. This result holds true for the more in-depth analyses by decile shares, too.

For all socioeconomic groups, the two tax reform alternatives, in particular, increase the richest ten percent income decile share and correspondingly decrease the ninety percent below. Thus the rising inequality by the effective tax reform 2000/2005 as well as by the “Karlsruhe proposal” in particular is due to a relative increase of the richest ten percent and a relative decrease of the below ninety percent. Thus, at least the taxreform as well as the “Karlsruhe proposal” are not resulting in a possible symmetric picture about a central measure of location like the mean or the median.

For the socioeconomic breakdowns occupation, professions, gender and family type we quantify the taxreform impacts on the distribution and the redistributive impacts to their subgroups. The results indicate that it is very important to resist the temptation to only do an overall impact analysis but to look to the subgroups of interests. The effects of the taxreform and the taxproposal are quite different. The current taxreform is more redistributive than the “Karlsruhe proposal”; the paper delivers all the numeric results for the socio-economic breakdowns and their subgroups. Substantially responsible for the different tax alternative impacts are the family and children and trade tax treatment. Naturally, the different tax tariffs have their impacts, too.

Decomposition Results

In addition to the distributional and redistributive analyses and results sketched above, this paper is answering the question, which subgroup is responsible for the overall inequality picture of a socioeconomic breakdown, by a decomposition analysis. Measured by a generalized entropy approach via the Theil inequality index the analyses further disentangled the distributional picture for the breakdowns (subgroups) of a socioeconomic group. The shape of inequality is quite different in the according subgroups; the within group inequality share varies roughly from 80% to more than 95%.

One striking and uniform result has to be attributed to the „Karlsruhe proposal“: married couples without children are the relative losers with regard to the mean, distributional and redistributive impacts compared to the actual taxreform 2000/2005.

Political consequences

The new German tax reform implemented by the red/green government diminishes the individual tax burden remarkably by approx. 60 billion €. Our microsimulation analysis has shown the consequences of all the details of the new German taxreform to the income distribution for various socioeconomic groups of particular interest. Which group is gaining and which group is losing relative to the others is now quantified. These results can now form the basis of an informed political debate on the results and their desirability.

Further research

In addition to the new German taxreform’s distributional impacts we also quantified the distributional impacts of an important alternative discussed, the “Karlsruhe proposal”. Further

research when changing tax items now have a base for discussion and need to be quantified. Amongst others, more actual data is needed at least by aging the sample via the adjustment to demographic changes, since demographic changes with its children's and family type's consequences will alter the results.

Altogether

Microsimulation has again been shown as a successful and well-suited tool for targeted analyses and extremely informative with regard to distributional and redistributive impacts for diverse socioeconomic groups of interest. Microsimulation is extremely powerful if a suitable micro database - like ours - is at hand. First round effects are now transparent. Second round effects with possible behavioural changes due to changed conditions are not captured yet in our analysis. However, based on experiences of other studies, quantifying these second round effects is a hard job also because economic theory is still struggling with modelling and explaining e.g. labour market behaviour with its incentive/disincentive effects. Unfortunately, the Income Tax Statistic does not provide working hours and further socioeconomic breakdowns for an economic modelling for those incentives/disincentive effects based on labour supply analyses (but see the such behaviour analyses by Wagenhals 2001 based on survey data; an analysis at the expense of all the taxation details). However, and above all, our first round effect analysis is the base and foundation for further behaviour investigations.

Such quantitative analyses, based on the people affected by economic and social policy, are the best we can do to characterise the individual living conditions. The analyses are able to show policy impacts even before real world applications are done. They help to reduce cost and manpower expenses in the political and administrative planning process as well as for other researchers with showing a clear picture and transparent impacts, even though the results are still based on a simulation.

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Appendix A1: The German Income Statistic 1995 Definitions

**Table A1a: German Income Tax Statistic 1995:
Determination of the Individual Taxable Income**

	SUM OF ALL INCOME (Summe der Einkünfte) as the sum from the seven income types (after deduction of professional outlay (Werbungskosten)/business allowances (Betriebsausgaben)
+	Amount still to be taxed (nachzuversteuernder Betrag) (§ 10a EStG)
+	Amount to be added (Hinzurechnungsbetrag) (§ 2 Abs. 1 Satz 3 AIG)
-	Foreign loss by double taxation agreement (ausländische Verluste bei DBA) (§ 2 Abs. 3 Satz 1 EStG)
-	Vom Ehegatten in 1995 geerbte nicht ausgeglichene Verluste
-	Old-Age exemption (Altersentlastungsbetrag) (§ 24a EStG)
-	Exemption for persons working in agriculture and forestry (§ 13 Abs. 3 EStG)
=	TOTAL INCOME (Gesamtbezug der Einkünfte)
-	Special Expenditures (§§ 10, 10b, 10c EStG)
-	Taxably favourable profits not withdrawn (§ 10a EStG)
-	Extraordinary tax burdens (§§ 33 bis 33c EStG, § 33a EStG in conjunction with § 52 Abs. 22 and 23, §53a EStG)
-	Favourable tax rate for self-utilisation of accommodation (§ 10e EStG)
-	Loss deduction (§ 10d EStG, § 2 Abs. 1 Satz 2 AIG)
=	INCOME (Einkommen)
-	Child Allowance (§ 32 Abs. 6 EStG)
-	Household budget allowance (§ 32 Abs. 7 EStG)
-	Amount remaining exempt according to § 46 Abs. 3 EStG, § 70 EStDV
-	Special allowance for persons limitedly liable to pay tax (§ 50 Abs. 3 EStG)
=	TAXABLE INCOME (zu versteuerndes Einkommen)

Source: Federal Statistical Office: Finanzen und Steuern, Fachserie 14, Reihe 7.1 Einkommensteuer (1995), p. 7

**Table A1b: German Income Tax Statistic 1995:
Determination of the Fixed Income Tax**

	TAX AMOUNT According to basic table/splitting tables or according to the rate of taxation when applying the Progression Reservation (§ 32b EStG)
+	Tax on income which is subject to a reduced rate of taxation (§§ 34, 34b, 34c Abs. 4 EStG)
=	TARIFF INCOME TAX (Tarifliche Einkommensteuer) (§ 32a Abs. 1 und 5 EStG)
-	Amount of exoneration (Entlastungsbetrag § 32 c EStG)
-	Foreign taxes (§ 34c Abs. 1 und 6 EStG, § 12 AStG)
-	Tax reductions for persons working in agriculture and forestry (§ 34e EStG)
+	Taxes according to § 34c Abs. 5 EStG
-	Child home building allowance (Baukindergeld) (§ 34f EStG)
-	Tax reductions on expenses incurred in the support of political parties, voting communities or membership fees (§ 34g EStG)
-	Tax reductions on burdens as a result of Inheritance Tax (§ 35 EStG)
+	Supplementary tax according to §§ 30, 31 EStDV
=	FIXED INCOME TAX (Festzusetzende Einkommensteuer) (§ 2 Abs. 6 EStG)

Source: Federal Statistical Office: Finanzen und Steuern, Fachserie 14, Reihe 7.1 Einkommensteuer (1995), p. 8

Appendix A2: Model for Sunday-, public holiday- and night work extra pay

The idea is to distribute the 3.8 billion DM that were granted as tax relief for Sunday-, public holiday- and night work extra pay (according to the state subsidy report (“Subventionsbericht”) of the federal government for 2002) according to § 3b EStG adequately on the 10% sample of the wage and income tax statistic 1995.

In a first step the stated amount had to be discounted with the cost-of-living price index to the year 1995 by the factor 109,6, resulting in the amount of 3.486 billion DM for 1995.

In the next step the ratio of Sunday and public holiday work as well as night work to the total gainful employment work is calculated with the help of the micro census 2000. The data was calculated and arranged according to age, basic- and splitting-table (Grund- und Splittingtabelle?) as well as net income. Because the ratios only had small variances as a simplification only one ratio could be respectively taken. The share of night work is 7% and Sunday work comprises 10% of the total gainful employment work.

The distribution of the tax relief on night work, Sunday- and public holiday work

From those gainfully employed who received Sunday-, public holiday- or night work extra pay 57% worked on Sundays or public holidays and 43% in the night. If one makes the assumption that night time work was done with a working time representing one whole normal working day and with about one fifth of a working day on Sundays and public holidays¹⁶, then the following ratios result:

5/5 and 1/5 result, if standardised onto one, a share of 0,83 for night work and 0,17 for Sunday work. Multiplied with the respective share of Sunday- or night work of the total work of the gainfully employed and again standardised onto one¹⁷, then the tax relief can be split up as follows:

Night work:	$0,79 * 3.486 \text{ billion tax relief} = 2.754 \text{ billion tax relief}$
Sunday work:	$0,21 * 3.486 \text{ billion tax relief} = 732 \text{ million tax relief}$

From the tax relief to the individual income component of the § 3b EStG

Out of the 10% sample the tax payers with predominantly gainful employment were isolated. From this group two random samples emerge, one of 7% for the night time work and a 10% one for the Sunday work.¹⁸ Each data set of these sub-sets receive a weight that is calculated

¹⁶ In the micro census those employees were recorded that worked always, or regularly, in the night or on Sundays

¹⁷ $0,83*0,43$ and $0,17*0,57$ standardised onto one give (0,79/ 0,21)

¹⁸ according to the respective share of the total work

out of the ration of the positive gainful employment income compared to the total gainful employment income¹⁹ of the relevant part of the population. According to these individual weights the total tax relief is divided onto the respective tax payer. With the individual average tax rate of the tax payer the underlying income share can be calculated out of the tax relief.

These steps are done in the “night sample” as well as in the “Sunday work sample”. The respective resulting income components are taken over in the 10% overall sample via the matching variable “serial number”

¹⁹ with consideration of the projection factor

Appendix 3

DISTRIBUTIONAL MEASURES

We concentrate ourselves on central and meaningful measures. For the theoretical foundation of the measurement of concentration, distribution and inequality we refer to the relevant literature, especially Atkinson 1970, 1987, Lüthi 1981, Cowell 1995 or Maasoumi 1999. Apart from the descriptive measures to describe a statistical mass like the arithmetic mean or the median (50% of the income receivers earn less as the median income) we use the following measures for the description of a distribution:

Gini-Coefficient

The Gini-Coefficient describes the inequality resp. equality of a distribution (corresponding with the area between the rectangular distribution line and the Lorenz curve). The smaller the coefficient is, the more the income is distributed equally. The Gini-coefficient is sensitive regarding the densely populated income region (middle area).

$$(1) \quad G = 1 + \frac{1}{n} - \frac{2}{n^2 \mathbf{m}} \sum_{i=1}^n i y_i \quad \text{where } y_1 \leq y_2 \leq \dots \leq y_n$$

where n = Population size, \mathbf{m} = Total average income, y_i = Income of person i .

Atkinson Measure

The Atkinson Measure allows a normative assessment regarding the inequality aversion. With $\varepsilon = 1$ indicating a relative low and $\varepsilon = 2$ a relatively high risk aversion. The Atkinson Measure is sensitive regarding the lower section of the income distribution.

$$(2) \quad A = 1 - \left[\frac{1}{n} \sum_{i=1}^n \left(\frac{y_i}{\mathbf{m}} \right)^{1-\varepsilon} \right]^{\frac{1}{1-\varepsilon}} \quad \text{for } \varepsilon \neq 1 \quad \text{and}$$

$$A = 1 - \exp \left[\frac{1}{n} \sum_{i=1}^n \left(\frac{y_i}{\mathbf{m}} \right) \right] \quad \text{for } \varepsilon = 1$$

Theil Index

Based on the information theory the Theil Index is sensitive regarding the lower income bracket. We also use the index for the decomposition analysis (see below).

$$(3) \quad I_1 = 1/n \sum_i (y_i/\mu) \log(y_i/\mu).$$

Percentiles (Deciles, Quintiles etc.)

Percentiles divide the population (here tax payers) according to a percentile (e.g. decile: 10%, quintile: 20% of the population). An income value is then attributed to each percentile. From these income values ordered according to size the income that e.g. 90% of the population maximally have can be calculated.

Percentile Shares

The percentile shares provide insight into the share of the total income that belongs to the percentile concerned. The decile shares e.g. show which share of the total income the poorest 10% earn, which share falls to the next 10% and so on until the richest 10% of the population.

Lorenz Curve

The Lorenz curve cumulates these income shares (percentile shares) from the respective percentiles/deciles of the tax payers (population share: x-axis, income share: y-axis). The magnitude of the area under the 45-degree line indicates the degree of inequality and corresponds with the Gini-Coefficient.

90/10 Relation

The 90/10 relation describes the relation between the income of the richest 10% to the poorest 10% of the population.

REDISTRIBUTIONAL MEASURES

An overall redistributive and easily interpretable measure is the k-measure by Blackburn. According to Blackburn's (1989) simple redistributive scheme every income unit below the median level of income receives an equal-sized, lump-sum tax that is transferred from every unit above the median (and vice versa) resulting in the same pre- and post tax/transfer distribution.

The redistributive effect then is the value of the lump-sum as a percentage of the mean level of before tax income. As Blackburn has shown, the respective index partitioning is valid only for the Gini-coefficient resulting in

$$(4) \quad R = k / \text{mean}_{\text{before tax}} = 2(\text{Gini}_{\text{after tax}} - \text{Gini}_{\text{before tax}})$$

**DECOMPOSITION OF INEQUALITY:
THE CONTRIBUTION OF SUBGROUPS TO OVERALL INEQUALITY**

A decomposition of the distributional measure can be used to establish which of the socio-demographic resp. socio-economic groups of a population are decisive for the level of inequality of a distribution. Such decomposition then shows the percentage share of the

inequality between the groups and within the groups. Such a decomposition is possible over / for a class of additive decomposable inequality measures (Shorrocks 1980, 1984) with

$$(5) \quad I_{\text{total},c} = I_W + I_B = \sum_g I_{Wg} + I_B = \sum_g w_g I_c(y_g) + I_B \\ = \sum_g p_g^{1-c} v_g^c I_c(y_g) + I_B = \sum_g (n_g/n) (\mu_g/\mu)^c I_c(y_g) + I_B$$

where I_W describes the inequality within and I_B the inequality between the groups (each group member is allotted with the same mean group income), g is the group index, μ is the general, resp. group specific (μ_g) mean value of the incomes, n is the number of observations, $I_c(y_g)$ is the group inequality index dependent on the group income y_g . The group weights $w_g = p_g^{1-c} v_g^c = (n_g/n)^{1-c} (\mu_g/\mu)^c$ out of the population- (p_g^{1-c}) and the income share (v_g^c) of the group g sum up to one only if $c = 0$ or $c = 1$.

Decomposition of the Theil Index

The only class of inequality measures with specific desirable properties (scale invariance of distributions with different means, additivity) belong to the class of the generalised entropy measures with

$$(6) \quad I_c = (1/n) 1/[c-(c-1)] \sum_i [(y_i/\mu)^c - 1] \quad c \neq 0 \text{ or } 1.$$

We use the Theil index as overall and group specific inequality measure, which is given for $c = 1$:

$$(7) \quad I_1 = 1/n \sum_i (y_i/\mu) \log(y_i/\mu).$$

To summarise: the Theil–decomposition from (2) and (4) provides the group-specific inequality contributions.

Inequality Shares

Inequality shares (%) are group specific percentages of I_w , the overall within group inequality part I_w . The between group inequality share (%) is calculated as I_B as a percentage of the overall inequality index $I_{\text{total},c}$.

Appendix 4: Numerical Results

Occupation – All

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	1 017		839		897		905	
Mean in EUR	34 532		28 497		30 470		30 749	
Median in EUR	27 924		24 422		26 012		25 994	
Distribution								
Gini-Coeffizient	0,4172		0,3768		0,3837		0,3877	
Aktinson Index mit $\epsilon = 1$	0,3314		0,2869		0,2975		0,3009	
Aktinson Index mit $\epsilon = 2$	0,8436		0,8072		0,8151		0,8237	
Theil Index	0,4080		0,3083		0,3326		0,3423	
Decile shares in % and decile limits in EUR								
1. Decile	0,9	6 793	1,0	6 707	1,0	6 777	1,0	6 795
2. Decile	3,1	14 141	3,6	13 265	3,5	13 956	3,4	13 819
3. Decile	4,9	19 694	5,5	17 694	5,4	18 710	5,3	18 740
4. Decile	6,3	23 933	6,8	21 095	6,7	22 332	6,7	22 388
5. Decile	7,5	27 924	8,0	24 422	7,9	26 012	7,9	25 994
6. Decile	8,7	32 474	9,2	28 211	9,2	30 122	9,1	30 062
7. Decile	10,2	38 521	10,7	32 976	10,7	35 158	10,6	35 503
8. Decile	12,3	46 671	12,6	39 228	12,6	41 683	12,6	42 396
9. Decile	15,3	60 508	15,3	49 578	15,2	52 262	15,3	53 004
10. Decile	30,8	-	27,3	-	27,9	-	28,1	-
90/10 Relation	36,3		27,0		29,3		29,6	
Redistribution								
R (%)	-		-8,1		-6,7		-5,9	
k(EUR)	-		- 2 789		- 2 313		- 2 037	

Occupation – Professions

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	29		22		24		24	
Mean in EUR	69 937		52 933		56 649		57 594	
Median in EUR	39 985		34 219		36 093		35 820	
Distribution								
Gini-Coeffizient	0,5670		0,5255		0,5320		0,5397	
Aktinson Index mit $\epsilon = 1$	0,4995		0,4434		0,4518		0,4596	
Aktinson Index mit $\epsilon = 2$	0,9352		0,9093		0,9139		0,9226	
Theil Index	0,8124		0,8103		0,7997		0,8118	
Decile shares in % and decile limits in EUR								
1. Decile	0,5	6 570	0,7	6 487	0,7	6 586	0,6	6 604
2. Decile	1,4	12 682	1,7	11 821	1,7	12 500	1,6	12 306
3. Decile	2,3	20 159	2,8	18 262	2,8	19 214	2,7	19 038
4. Decile	3,5	28 939	4,1	25 541	4,1	26 891	3,9	26 587
5. Decile	4,9	39 985	5,6	34 219	5,5	36 093	5,4	35 820
6. Decile	6,7	54 693	7,5	45 315	7,4	47 638	7,2	47 754
7. Decile	9,2	74 884	9,9	59 675	9,7	62 841	9,6	62 891
8. Decile	12,6	103 327	13,0	78 410	12,8	82 987	12,6	83 597
9. Decile	17,9	153 090	17,3	107 823	17,3	116 960	17,3	119 932
10. Decile	41,1	-	37,5	-	38,2	-	39,1	-
90/10 Relation	79,0		54,3		58,8		61,1	
Redistribution								
R (%)	-		-8,3		-7,0		-5,5	
k(EUR)	-		- 5 806		- 4 896		- 3 821	

Occupation – Entrepreneurs

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	109		76		88		89	
Mean in EUR	54 293		37 958		43 790		44 282	
Median in EUR	24 757		22 610		23 825		23 415	
Distribution								
Gini-Coeffizient	0,6392		0,5474		0,5835		0,5917	
Aktinson Index mit $\epsilon = 1$	0,5571		0,4489		0,4911		0,4994	
Aktinson Index mit $\epsilon = 2$	0,9503		0,9291		0,9343		0,9370	
Theil Index	1,1593		0,7619		0,9195		0,9638	
Decile shares in % and decile limits in EUR								
1. Decile	0,6	6 117	0,8	5 972	0,7	6 081	0,7	6 105
2. Decile	1,5	10 317	2,1	9 999	1,9	10 312	1,9	10 233
3. Decile	2,3	14 690	3,1	13 814	2,8	14 419	2,8	14 265
4. Decile	3,1	19 340	4,2	17 938	3,8	18 766	3,7	18 595
5. Decile	4,0	24 757	5,3	22 610	4,8	23 825	4,7	23 415
6. Decile	5,2	31 931	6,7	28 303	6,1	30 149	6,0	29 505
7. Decile	6,8	42 105	8,4	36 061	7,8	38 496	7,6	38 154
8. Decile	9,1	58 588	10,9	47 577	10,1	51 235	10,0	50 973
9. Decile	13,6	95 745	15,1	70 410	14,3	78 453	14,0	78 082
10. Decile	53,7	-	43,4	-	47,6	-	48,7	-
90/10 Relation	88,1		51,6		64,3		65,8	
Redistribution								
R (%)	-		-18,4		-11,1		-9,5	
k(EUR)	-		- 9 964		- 6 044		- 5 155	

Occupation – Employees

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	827		696		739		746	
Mean in EUR	33 881		28 495		30 281		30 549	
Median in EUR	29 376		25 510		27 295		27 285	
Distribution								
Gini-Coeffizient	0,3459		0,3189		0,3196		0,3231	
Aktinson Index mit $\epsilon = 1$	0,2195		0,1898		0,1935		0,1964	
Aktinson Index mit $\epsilon = 2$	0,5567		0,4840		0,5055		0,5005	
Theil Index	0,2205		0,1849		0,1869		0,1906	
Decile shares in % and decile limits in EUR								
1. Decile	1,6	9 828	1,9	9 544	1,8	9 846	1,8	9 831
2. Decile	4,1	17 160	4,5	15 543	4,5	16 530	4,4	16 452
3. Decile	5,8	21 925	6,2	19 275	6,2	20 471	6,1	20 560
4. Decile	7,0	25 665	7,3	22 379	7,3	23 825	7,3	23 886
5. Decile	8,1	29 376	8,4	25 510	8,4	27 295	8,4	27 285
6. Decile	9,3	33 785	9,6	29 158	9,6	31 186	9,6	31 175
7. Decile	10,8	39 552	11,0	33 657	11,1	35 913	11,0	36 400
8. Decile	12,7	47 071	12,8	39 433	12,8	41 920	12,9	42 722
9. Decile	15,5	59 314	15,3	48 530	15,2	51 273	15,4	52 141
10. Decile	25,1	-	23,2	-	23,1	-	23,2	-
90/10 Relation	15,8		12,3		12,9		13,1	
Redistribution								
R (%)	-		-5,4		-5,3		-4,6	
k(EUR)	-		- 1 832		- 1 785		- 1 545	

Occupation – Others

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	51		45		46		47	
Mean in EUR	19 641		17 250		17 745		17 831	
Median in EUR	11 319		11 173		11 227		11 250	
Distribution								
Gini-Coeffizient	0,6687		0,6329		0,6396		0,6419	
Aktinson Index mit $\epsilon = 1$	0,7032		0,6736		0,6802		0,6811	
Aktinson Index mit $\epsilon = 2$	0,9558		0,9475		0,9478		0,9517	
Theil Index	1,1133		0,9123		0,9383		0,9679	
Decile shares in % and decile limits in EUR								
1. Decile	0,2	517	0,2	512	0,2	509	0,2	511
2. Decile	0,4	893	0,4	885	0,4	882	0,4	885
3. Decile	0,6	1 560	0,7	1 539	0,7	1 532	0,7	1 537
4. Decile	1,4	5 534	1,5	5 343	1,4	5 323	1,4	5 366
5. Decile	4,4	11 319	5,0	11 173	4,8	11 227	4,8	11 250
6. Decile	6,8	15 359	7,7	15 159	7,5	15 283	7,5	15 277
7. Decile	8,8	19 239	9,9	18 932	9,7	19 140	9,6	19 102
8. Decile	11,0	24 445	12,3	23 858	12,1	24 228	12,0	24 113
9. Decile	14,9	36 182	16,3	34 311	16,2	35 221	16,0	34 814
10. Decile	51,6	-	46,2	-	47,0	-	47,4	-
90/10 Relation	322,6		256,4		276,7		279,0	
Redistribution								
R (%)	-		-7,2		-5,8		-5,4	
k(EUR)	-		- 1 407		- 1 145		- 1 054	

Professions – All

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	27		20		22		22	
Mean in EUR	75 475		56 848		60 910		61 974	
Median in EUR	44 932		37 927		39 971		39 868	
Distribution								
Gini-Coeffizient	0,5542		0,5136		0,5200		0,5280	
Aktinson Index mit $\epsilon = 1$	0,4769		0,4224		0,4302		0,4386	
Aktinson Index mit $\epsilon = 2$	0,9360		0,9129		0,9178		0,9194	
Theil Index	0,8015		0,8156		0,8010		0,8119	
Decile shares in % and decile limits in EUR								
1. Decile	0,6	7 761	0,8	7 537	0,8	7 779	0,7	7 790
2. Decile	1,5	14 886	1,8	13 671	1,8	14 478	1,8	14 260
3. Decile	2,5	23 193	3,0	20 751	3,0	21 840	2,9	21 649
4. Decile	3,7	32 909	4,3	28 551	4,3	30 130	4,1	29 715
5. Decile	5,1	44 932	5,8	37 927	5,7	39 971	5,6	39 868
6. Decile	6,9	60 521	7,7	49 532	7,5	52 172	7,4	52 271
7. Decile	9,3	81 396	10,0	64 102	9,8	67 671	9,6	67 725
8. Decile	12,6	110 598	12,9	83 032	12,7	88 013	12,5	88 889
9. Decile	17,6	161 366	16,9	112 412	16,9	122 451	16,9	126 000
10. Decile	40,2	-	36,9	-	37,6	-	38,4	-
90/10 Relation	66,9		46,7		50,1		51,9	
Redistribution								
R (%)	-		-8,1		-6,8		-5,2	
k(EUR)	-		- 6 129		- 5 163		- 3 955	

Professions – Medical

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	15		11		12		12	
Mean in EUR	110 816		81 805		88 021		90 157	
Median in EUR	79 567		62 545		66 118		66 492	
Distribution								
Gini-Coeffizient	0,4838		0,4526		0,4593		0,4672	
Aktinson Index mit $\epsilon = 1$	0,3782		0,3400		0,3462		0,3543	
Aktinson Index mit $\epsilon = 2$	0,7640		0,6938		0,7091		0,7032	
Theil Index	0,8262		0,9619		0,9208		0,9173	
Decile shares in % and decile limits in EUR								
1. Decile	1,0	19 102	1,3	17 399	1,2	18 378	1,2	18 054
2. Decile	2,4	32 707	2,8	28 407	2,8	29 939	2,7	29 511
3. Decile	3,6	46 543	4,1	39 176	4,0	41 170	3,9	41 039
4. Decile	4,9	62 171	5,5	50 453	5,4	53 206	5,3	53 718
5. Decile	6,4	79 567	6,9	62 545	6,8	66 118	6,7	66 492
6. Decile	8,0	98 939	8,4	75 375	8,3	79 954	8,2	80 677
7. Decile	9,9	121 742	10,0	89 141	9,9	95 001	9,8	96 862
8. Decile	12,2	151 973	11,9	106 222	11,9	115 697	11,9	119 135
9. Decile	15,8	206 049	14,6	136 931	14,9	151 998	15,1	158 320
10. Decile	35,8	-	34,5	-	34,9	-	35,4	-
90/10 Relation	35,8		27,0		28,1		29,7	
Redistribution								
R (%)	-		-6,2		-4,9		-3,3	
k(EUR)	-		- 6 915		- 5 430		- 3 679	

Professions – Legal and Economic Advisors

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	4		3		4		4	
Mean in EUR	81 885		61 239		65 611		66 442	
Median in EUR	57 322		47 151		49 690		49 587	
Distribution								
Gini-Coeffizient	0,4876		0,4411		0,4484		0,4570	
Aktinson Index mit $\epsilon = 1$	0,3811		0,3230		0,3311		0,3402	
Aktinson Index mit $\epsilon = 2$	0,8231		0,7755		0,7805		0,7989	
Theil Index	0,4394		0,3558		0,3675		0,3848	
Decile shares in % and decile limits in EUR								
1. Decile	0,9	12 994	1,2	12 209	1,1	12 876	1,1	12 651
2. Decile	2,2	23 292	2,7	20 719	2,7	21 868	2,6	21 731
3. Decile	3,5	33 272	4,1	28 802	4,0	30 312	3,9	29 826
4. Decile	4,7	44 454	5,4	37 387	5,3	39 487	5,2	39 248
5. Decile	6,2	57 322	6,9	47 151	6,8	49 690	6,7	49 587
6. Decile	7,9	72 475	8,6	58 247	8,4	61 212	8,3	60 934
7. Decile	9,9	90 670	10,5	70 632	10,3	74 533	10,2	74 318
8. Decile	12,5	116 432	12,8	87 436	12,7	92 688	12,5	93 326
9. Decile	16,8	165 856	16,4	117 393	16,4	126 757	16,4	129 292
10. Decile	35,4	-	31,6	-	32,4	-	33,3	-
90/10 Relation	39,4		27,5		28,9		30,5	
Redistribution								
R (%)	-		-9,3		-7,8		-6,1	
k(EUR)	-		- 7 615		- 6 420		- 5 011	

Professions – Technical and Scientific

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	5		4		4		4	
Mean in EUR	66 152		50 922		54 210		54 739	
Median in EUR	42 345		36 265		38 208		38 069	
Distribution								
Gini-Coeffizient	0,5203		0,4741		0,4793		0,4868	
Aktinson Index mit $\epsilon = 1$	0,4165		0,3596		0,3668		0,3741	
Aktinson Index mit $\epsilon = 2$	0,9391		0,9220		0,9269		0,9270	
Theil Index	0,5759		0,4860		0,4939		0,5136	
Decile shares in % and decile limits in EUR								
1. Decile	0,8	9 627	1,0	9 073	1,0	9 596	1,0	9 502
2. Decile	2,1	17 954	2,5	16 309	2,5	17 275	2,4	17 034
3. Decile	3,3	25 454	3,8	22 592	3,8	23 793	3,7	23 501
4. Decile	4,4	33 402	5,1	29 062	5,0	30 728	4,9	30 312
5. Decile	5,7	42 345	6,4	36 265	6,4	38 208	6,2	38 069
6. Decile	7,2	53 434	7,9	44 780	7,8	47 069	7,8	47 037
7. Decile	9,1	68 029	9,8	55 352	9,7	58 304	9,6	58 149
8. Decile	11,8	88 776	12,2	69 716	12,1	73 563	11,9	73 090
9. Decile	16,0	129 742	16,0	96 283	15,8	102 646	15,7	102 978
10. Decile	39,6	-	35,3	-	36,0	-	36,9	-
90/10 Relation	48,2		33,9		36,0		37,2	
Redistribution								
R (%)	-		-9,2		-8,2		-6,7	
k(EUR)	-		- 6 112		- 5 425		- 4 432	

Professions – Paedagogic and Translating

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	1		1		1		1	
Mean in EUR	28 102		23 377		24 784		24 806	
Median in EUR	18 291		16 623		17 548		17 429	
Distribution								
Gini-Coeffizient	0,5071		0,4639		0,4685		0,4725	
Aktinson Index mit $\epsilon = 1$	0,3958		0,3427		0,3509		0,3544	
Aktinson Index mit $\epsilon = 2$	0,9125		0,8740		0,8809		0,8818	
Theil Index	0,4927		0,3870		0,4008		0,4129	
Decile shares in % and decile limits in EUR								
1. Decile	1,0	4 802	1,2	4 742	1,2	4 807	1,2	4 817
2. Decile	2,2	7 500	2,6	7 252	2,5	7 518	2,5	7 518
3. Decile	3,2	10 422	3,7	9 800	3,6	10 370	3,6	10 258
4. Decile	4,4	14 083	4,9	12 959	4,9	13 750	4,8	13 529
5. Decile	5,8	18 291	6,3	16 623	6,3	17 548	6,2	17 429
6. Decile	7,3	23 160	8,0	20 863	7,9	21 996	7,9	21 850
7. Decile	9,4	30 012	10,1	26 569	10,1	28 134	10,0	27 805
8. Decile	12,3	39 962	12,9	34 477	12,9	36 510	12,8	36 346
9. Decile	17,2	58 763	17,4	48 214	17,3	50 980	17,3	51 158
10. Decile	37,3	-	33,0	-	33,4	-	33,9	-
90/10 Relation	36,2		26,8		28,8		29,2	
Redistribution								
R (%)	-		-8,6		-7,7		-6,9	
k(EUR)	-		- 2 428		- 2 169		- 1 945	

Professions – Publicistic and Artistical

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	1		1		1		1	
Mean in EUR	29 237		23 357		24 821		24 990	
Median in EUR	15 211		13 796		14 672		14 547	
Distribution								
Gini-Coeffizient	0,5901		0,5393		0,5449		0,5501	
Aktinson Index mit $\epsilon = 1$	0,4976		0,4335		0,4420		0,4478	
Aktinson Index mit $\epsilon = 2$	0,9400		0,9258		0,9290		0,9298	
Theil Index	0,7455		0,5932		0,6069		0,6310	
Decile shares in % and decile limits in EUR								
1. Decile	0,7	3 755	0,9	3 741	0,9	3 756	0,9	3 765
2. Decile	1,7	5 910	2,1	5 827	2,0	5 931	2,0	5 943
3. Decile	2,4	8 274	2,9	7 932	2,8	8 283	2,8	8 285
4. Decile	3,3	11 259	3,9	10 485	3,9	11 174	3,8	10 997
5. Decile	4,5	15 211	5,2	13 796	5,2	14 672	5,1	14 547
6. Decile	6,0	20 097	6,8	18 082	6,8	18 986	6,7	18 912
7. Decile	8,0	27 109	8,9	23 632	8,8	24 910	8,7	24 738
8. Decile	10,9	37 871	11,7	31 948	11,6	33 722	11,5	33 557
9. Decile	16,3	60 751	16,8	48 854	16,7	51 383	16,5	51 174
10. Decile	46,3	-	40,9	-	41,4	-	42,1	-
90/10 Relation	63,4		44,9		48,2		49,0	
Redistribution								
R (%)	-		-10,2		-9,0		-8,0	
k(EUR)	-		- 2 970		- 2 643		- 2 339	

Gender – All

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	316		261		278		280	
Mean in EUR	22 315		18 445		19 612		19 768	
Median in EUR	20 199		17 605		18 749		18 779	
Distribution								
Gini-Coeffizient	0,4031		0,3589		0,3659		0,3703	
Aktinson Index mit $\epsilon = 1$	0,3335		0,2867		0,2984		0,3015	
Aktinson Index mit $\epsilon = 2$	0,8488		0,8131		0,8197		0,8300	
Theil Index	0,3884		0,2825		0,3110		0,3206	
Decile shares in % and decile limits in EUR								
1. Decile	0,7	3 412	0,9	3 381	0,8	3 381	0,8	3 388
2. Decile	2,7	8 276	3,2	8 157	3,0	8 257	3,0	8 271
3. Decile	4,7	12 632	5,4	11 855	5,3	12 506	5,2	12 335
4. Decile	6,6	16 682	7,3	15 051	7,3	16 029	7,2	15 876
5. Decile	8,3	20 199	8,9	17 605	8,9	18 749	8,8	18 779
6. Decile	9,7	23 202	10,2	19 825	10,2	21 066	10,1	21 195
7. Decile	11,1	26 383	11,4	22 199	11,3	23 505	11,3	23 738
8. Decile	12,7	30 557	12,8	25 287	12,8	26 687	12,8	27 011
9. Decile	15,2	38 132	15,0	30 783	14,9	32 360	14,9	32 708
10. Decile	28,4	-	25,0	-	25,6	-	25,9	-
90/10 Relation	40,0		29,4		32,4		32,7	
Redistribution								
R (%)	-		-8,8		-7,4		-6,6	
k(EUR)	-		- 1 973		- 1 660		- 1 464	

Gender – Men

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	185		150		160		162	
Mean in EUR	23 939		19 455		20 745		20 967	
Median in EUR	21 131		18 235		19 415		19 497	
Distribution								
Gini-Coeffizient	0,4124		0,3637		0,3720		0,3770	
Aktinson Index mit $\epsilon = 1$	0,3274		0,2751		0,2880		0,2919	
Aktinson Index mit $\epsilon = 2$	0,8395		0,8140		0,8195		0,8393	
Theil Index	0,4241		0,3012		0,3352		0,3468	
Decile shares in % and decile limits in EUR								
1. Decile	0,9	4 146	1,1	4 114	1,0	4 113	1,0	4 120
2. Decile	2,7	8 608	3,3	8 462	3,1	8 587	3,1	8 591
3. Decile	4,5	13 178	5,3	12 302	5,2	13 004	5,1	12 835
4. Decile	6,4	17 520	7,2	15 644	7,2	16 656	7,1	16 569
5. Decile	8,1	21 131	8,7	18 235	8,7	19 415	8,6	19 497
6. Decile	9,5	24 255	10,0	20 483	9,9	21 756	9,9	21 949
7. Decile	10,8	27 529	11,1	22 867	11,1	24 229	11,1	24 509
8. Decile	12,3	31 867	12,5	26 097	12,4	27 536	12,5	27 921
9. Decile	14,9	40 443	14,8	32 191	14,6	33 871	14,6	34 315
10. Decile	29,9	-	26,0	-	26,8	-	27,1	-
90/10 Relation	35,8		24,8		27,3		27,7	
Redistribution								
R (%)	-		-9,7		-8,1		-7,1	
k(EUR)	-		- 2 332		- 1 934		- 1 695	

Gender – Women

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	131		111		118		118	
Mean in EUR	20 373		17 237		18 258		18 335	
Median in EUR	19 136		16 915		18 011		17 979	
Distribution								
Gini-Coeffizient	0,3870		0,3505		0,3554		0,3589	
Atkinson Index mit $\epsilon = 1$	0,3361		0,2976		0,3076		0,3093	
Atkinson Index mit $\epsilon = 2$	0,8554		0,8107		0,8183		0,8172	
Theil Index	0,3307		0,2531		0,2735		0,2794	
Decile shares in % and decile limits in EUR								
1. Decile	0,6	2 573	0,7	2 553	0,6	2 551	0,6	2 556
2. Decile	2,5	7 815	3,0	7 718	2,8	7 799	2,8	7 817
3. Decile	4,9	12 050	5,6	11 395	5,5	11 996	5,4	11 834
4. Decile	6,9	15 837	7,5	14 439	7,5	15 376	7,4	15 165
5. Decile	8,6	19 136	9,1	16 915	9,2	18 011	9,1	17 979
6. Decile	10,1	22 016	10,4	19 047	10,5	20 233	10,4	20 301
7. Decile	11,5	25 015	11,7	21 333	11,7	22 602	11,7	22 743
8. Decile	13,2	28 980	13,2	24 355	13,2	25 694	13,2	25 915
9. Decile	15,7	35 525	15,4	29 279	15,3	30 747	15,4	31 029
10. Decile	26,0	-	23,4	-	23,7	-	23,9	-
90/10 Relation	46,5		35,4		38,3		38,6	
Redistribution								
R (%)	-		-7,3		-6,3		-5,6	
k(EUR)	-		- 1 487		- 1 288		- 1 145	

Family-Type – All

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	1 017		839		897		905	
Mean in EUR	34 532		28 497		30 470		30 749	
Median in EUR	27 924		24 422		26 012		25 994	
Distribution								
Gini-Coeffizient	0,4172		0,3768		0,3837		0,3877	
Aktinson Index mit $\epsilon = 1$	0,3314		0,2869		0,2975		0,3009	
Aktinson Index mit $\epsilon = 2$	0,8436		0,8072		0,8151		0,8237	
Theil Index	0,4080		0,3083		0,3326		0,3423	
Decile shares in % and decile limits in EUR								
1. Decile	0,9	6 793	1,0	6 707	1,0	6 777	1,0	6 795
2. Decile	3,1	14 141	3,6	13 265	3,5	13 956	3,4	13 819
3. Decile	4,9	19 694	5,5	17 694	5,4	18 710	5,3	18 740
4. Decile	6,3	23 933	6,8	21 095	6,7	22 332	6,7	22 388
5. Decile	7,5	27 924	8,0	24 422	7,9	26 012	7,9	25 994
6. Decile	8,7	32 474	9,2	28 211	9,2	30 122	9,1	30 062
7. Decile	10,2	38 521	10,7	32 976	10,7	35 158	10,6	35 503
8. Decile	12,3	46 671	12,6	39 228	12,6	41 683	12,6	42 396
9. Decile	15,3	60 508	15,3	49 440	15,2	52 262	15,3	53 004
10. Decile	30,8	-	27,3	-	27,9	-	28,1	-
90/10 Relation	36,3		27,0		29,3		29,6	
Redistribution								
R (%)	-		-8,1		-6,7		-5,9	
k(EUR)	-		- 2 790		- 2 314		- 2 037	

Family-Type – Single (without children)

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	283		234		248		250	
Mean in EUR	22 025		18 172		19 321		19 435	
Median in EUR	20 021		17 432		18 562		18 572	
Distribution								
Gini-Coeffizient	0,4088		0,3648		0,3715		0,3752	
Aktinson Index mit $\epsilon = 1$	0,3441		0,2956		0,3071		0,3101	
Aktinson Index mit $\epsilon = 2$	0,8451		0,8119		0,8222		0,8217	
Theil Index	0,3953		0,2885		0,3171		0,3264	
Decile shares in % and decile limits in EUR								
1. Decile	0,7	3 066	0,8	3 052	0,8	3 059	0,7	3 060
2. Decile	2,5	7 774	3,0	7 678	2,8	7 770	2,8	7 774
3. Decile	4,5	12 142	5,3	11 409	5,1	12 047	5,1	11 902
4. Decile	6,5	16 394	7,3	14 784	7,3	15 755	7,1	15 617
5. Decile	8,3	20 021	8,9	17 432	8,9	18 562	8,8	18 572
6. Decile	9,8	23 059	10,2	19 669	10,2	20 890	10,2	20 990
7. Decile	11,2	26 234	11,5	22 038	11,4	23 326	11,4	23 493
8. Decile	12,8	30 392	12,9	25 110	12,9	26 486	12,9	26 719
9. Decile	15,3	37 941	15,1	30 556	15,0	32 123	15,0	32 339
10. Decile	28,6	-	25,1	-	25,7	-	25,9	-
90/10 Relation	43,3		31,8		34,3		35,1	
Redistribution								
R (%)	-		-8,8		-7,5		-6,7	
k(EUR)	-		- 1 938		- 1 643		- 1 480	

Family-Type – Single (with Children)

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	33		28		30		30	
Mean in EUR	25 168		21 126		22 461		23 034	
Median in EUR	21 697		19 187		20 442		20 726	
Distribution								
Gini-Coeffizient	0,3453		0,2989		0,3085		0,3189	
Aktinson Index mit $\epsilon = 1$	0,2136		0,1845		0,1995		0,2000	
Aktinson Index mit $\epsilon = 2$	0,8790		0,8224		0,7788		0,8874	
Theil Index	0,3215		0,2226		0,2498		0,2603	
Decile shares in % and decile limits in EUR								
1. Decile	2,3	9 095	2,5	8 844	2,3	8 915	2,3	9 049
2. Decile	4,4	12 818	5,1	12 331	4,9	12 732	4,7	12 498
3. Decile	5,7	15 860	6,5	14 849	6,3	15 668	6,0	15 288
4. Decile	6,9	18 852	7,5	17 030	7,5	18 152	7,3	18 167
5. Decile	8,1	21 697	8,6	19 187	8,6	20 442	8,5	20 726
6. Decile	9,2	24 580	9,6	21 315	9,6	22 705	9,5	23 201
7. Decile	10,4	27 817	10,6	23 740	10,6	25 216	10,7	26 059
8. Decile	11,8	32 048	11,9	26 924	11,9	28 496	12,1	29 650
9. Decile	14,1	39 985	13,9	32 713	13,9	34 529	14,1	36 096
10. Decile	27,2	-	23,7	-	24,3	-	24,9	-
90/10 Relation	12,0		9,4		10,6		10,7	
Redistribution								
R (%)	-		-9,3		-7,4		-5,3	
k(EUR)	-		- 2 336		- 1 852		- 1 329	

Family-Type – Married Couple (without Children)

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	279		233		247		243	
Mean in EUR	42 290		35 266		37 518		36 807	
Median in EUR	35 190		31 668		33 569		33 021	
Distribution								
Gini-Coeffizient	0,3930		0,3410		0,3506		0,3487	
Aktinson Index mit $\epsilon = 1$	0,3144		0,2641		0,2765		0,2749	
Aktinson Index mit $\epsilon = 2$	0,8280		0,7977		0,8080		0,8049	
Theil Index	0,3637		0,2539		0,2829		0,2895	
Decile shares in % and decile limits in EUR								
1. Decile	0,9	10 698	1,1	10 649	1,0	10 689	1,0	10 689
2. Decile	3,7	19 609	4,4	19 157	4,2	19 590	4,3	19 542
3. Decile	5,3	25 328	6,1	23 868	6,0	25 108	6,1	24 794
4. Decile	6,6	30 130	7,3	27 736	7,3	29 410	7,3	28 899
5. Decile	7,7	35 190	8,4	31 668	8,4	33 569	8,4	33 021
6. Decile	9,0	40 925	9,6	35 864	9,5	38 021	9,6	37 321
7. Decile	10,4	47 489	10,8	40 598	10,8	42 935	10,8	41 907
8. Decile	12,2	55 872	12,3	46 730	12,2	49 229	12,1	47 729
9. Decile	14,7	70 887	14,6	57 622	14,4	60 463	14,2	58 291
10. Decile	29,5	-	25,3	-	26,2	-	26,3	-
90/10 Relation	32,7		23,5		25,7		25,3	
Redistribution								
R (%)	-		-10,4		-8,5		-8,9	
k(EUR)	-		- 4 398		- 3 586		- 3 747	

Family-Type – Married Couple (with one Child)

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	175		145		155		157	
Mean in EUR	47 201		38 904		41 704		42 402	
Median in EUR	39 799		34 377		36 800		37 870	
Distribution								
Gini-Coeffizient	0,3157		0,2684		0,2719		0,2735	
Aktinson Index mit $\epsilon = 1$	0,1681		0,1265		0,1318		0,1337	
Aktinson Index mit $\epsilon = 2$	0,4366		0,3442		0,3300		0,3539	
Theil Index	0,2502		0,1693		0,1846		0,1895	
Decile shares in % and decile limits in EUR								
1. Decile	3,2	21 320	3,8	20 387	3,7	21 434	3,6	21 268
2. Decile	5,2	26 854	5,8	24 537	5,8	26 509	5,7	26 505
3. Decile	6,1	31 045	6,7	27 825	6,8	30 024	6,7	30 474
4. Decile	7,0	35 300	7,6	31 038	7,6	33 355	7,6	34 182
5. Decile	8,0	39 799	8,4	34 377	8,4	36 800	8,5	37 870
6. Decile	8,9	44 573	9,3	37 952	9,3	40 448	9,4	41 593
7. Decile	10,0	50 320	10,3	42 196	10,2	44 786	10,3	45 912
8. Decile	11,4	58 067	11,5	47 888	11,4	50 649	11,5	51 535
9. Decile	13,6	72 791	13,5	58 551	13,3	61 712	13,2	62 088
10. Decile	26,5	-	23,1	-	23,6	-	23,6	-
90/10 Relation	8,3		6,1		6,5		6,5	
Redistribution								
R (%)	-		-9,5		-8,8		-8,4	
k(EUR)	-		- 4 465		- 4 135		- 3 984	

Family-Type – Married Couple (with two or more Children)

Measure	Market income		Disposable income Taxbase 1995		Disposable income Taxbase 2000/2005		Disposable income "Karlsruhe proposal"	
Total in Bill. EUR	246		201		217		225	
Mean in EUR	49 506		40 327		43 614		45 232	
Median in EUR	39 549		34 037		36 713		38 168	
Distribution								
Gini-Coeffizient	0,3396		0,2906		0,2924		0,3048	
Aktinson Index mit $\epsilon = 1$	0,1906		0,1462		0,1500		0,1585	
Aktinson Index mit $\epsilon = 2$	0,5248		0,3289		0,3511		0,3433	
Theil Index	0,3428		0,2519		0,2661		0,2770	
Decile shares in % and decile limits in EUR								
1. Decile	3,2	22 254	3,8	20 969	3,7	22 528	3,6	22 326
2. Decile	5,1	27 346	5,7	24 736	5,8	27 067	5,5	26 586
3. Decile	5,9	31 124	6,5	27 654	6,6	30 183	6,2	29 665
4. Decile	6,7	35 082	7,2	30 713	7,3	33 306	6,9	33 441
5. Decile	7,5	39 549	8,0	34 037	8,0	36 713	7,9	38 168
6. Decile	8,5	44 436	8,9	37 711	8,8	40 473	9,0	42 861
7. Decile	9,6	50 427	9,9	42 185	9,8	45 063	10,0	48 024
8. Decile	11,0	59 051	11,2	48 579	11,0	51 646	11,3	54 977
9. Decile	13,4	76 062	13,3	60 707	13,1	64 315	13,4	67 633
10. Decile	29,2	-	25,5	-	26,0	-	26,2	-
90/10 Relation	9,1		6,8		7,0		7,3	
Redistribution								
R (%)	-		-9,8		-9,4		-7,0	
k(EUR)	-		- 4 852		- 4 673		- 3 446	

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