Effects of Changes in Tax/Benefit Policies in Austria 2003–2005

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Abstract: The aim of this paper is to evaluate whether policy reforms in Austria between 2003 and 2005 were successful in meeting redistributive objectives and in reducing poverty. The authors use the tax/benefit micro-simulation model EUROMOD for this analysis. In the period under review the 2004–2005 tax reform was introduced and contributions to health insurance were raised. On the benefit side no major changes took place, the main family benefits were not even indexed to inflation. The authors find that the measures had no significant impact on poverty and income distribution. However, in total they increased the disposable income of almost all groups of the population.

Keywords: policy reform, micro-simulation, income inequality, redistribution, Austria

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Introduction

The Austrian welfare system does not focus primarily on persons at risk of poverty. As the Austrian National Action Plan for Social Inclusion states, 'family policy is based on the principle of horizontal compensation, with state benefits being redistributed away from persons without dependent children to those who have childcare obligations' [*National Action Plan*... 2001: 18]. However, the same source points out that 'in Austria there is a general consensus that combating poverty and social exclusion are central matters of political concern for society' [*Second National Action Plan* ... 2003: 3]. Therefore, it could be argued that in Austria the approach to combating poverty is 'preventive', as it includes the whole population – not just the socially disadvantaged – in the welfare state system. In fact, the redistributive impact of taxes and benefits from high- to low-income classes is considerable.

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The aim of this paper is to evaluate whether the tax/benefit policy reforms introduced between 2003 and 2005 were successful in reducing poverty and in meeting redistributive objectives (connected with the reduction of inequality of disposable income with respect to differences in primary income and family composition). The questions addressed in this article are:

- Who benefited and who lost out from the changes to taxes and benefits?
- Did vulnerable groups, particularly children or the elderly, gain from these reforms?
- What were the effects on people living in different household types (e.g. households with and without children, single parents, etc.)?
- What were the consequences of the policy changes in terms of social security contributions, income tax, and cash benefits paid/received by each income quintile?
- How did the redistributive impact of these instruments change over time?

In order to answer these questions, we use the tax/benefit micro-simulation model EUROMOD. The tax/benefit model is based on representative household micro-data and is designed to analyse the effects of changes to components of disposable household income, particularly social security contributions, personal taxes, and cash benefits. Austria is one of the few countries that make little use of tax/benefit micro-simulation for national policy analysis and debate. Instead, it usually evaluates tax/benefit changes using administrative data, which refer only to individuals, or by analysing the effects on 'typical' model families. However, when analysing distributional effects the household context is crucial, and there are limitations to measuring the effects on model families, as the effects represent only a certain part of the whole population. In contrast, tax/benefit micro-simulation models are able to analyse the effects of policy changes and of their interactions with already existing policies on all population groups, both at the individual and at the household level.

We use the EU-SILC 2004 with income data for 2003 as the source of data for the analysis.[1] The special approach we apply makes it possible to measure the 'pure policy effect' of the reforms. The approach is described in more detail below.

This article begins with a description of methodological issues, like the capabilities of EUROMOD and tax/benefit micro-simulation models in general, followed by explanations of the approach and definitions we apply throughout the paper. A short overview is then provided of Austria's position in Europe with regard to the structure of taxes and benefits and social inclusion and income distribution. This is followed by a description of the policy reforms introduced be-

[1] The EU-SILC (Survey on Income and Living Conditions) micro-data including detailed national income variables is provided by Statistik Austria (see Statistik Austria [2006a] and http://www.statistik.at/fachbereich_03/eusilc_txt.shtml). The sample comprised 11 524 individuals in 4521 households.

tween 2003 and 2005 and an evaluation of their impact on poverty and income distribution. The article closes with a summary of findings and conclusions.

Methodological issues

Tax/benefit micro-simulation and EUROMOD

The tax/benefit micro-simulation model EUROMOD is a flexible tool that enables research on the effects of policy reforms that have an impact on incomes, poverty, inequality, and social inclusion.[2] Particularly important for the purpose at hand is that it facilitates an analysis of policy changes at a very high level of detail and coherence. With EUROMOD it is possible to analyse single components of the tax/benefit system in a broken-down form, which are hard to obtain from other sources (e.g. benefits broken down by income, age, gender and household type).

Micro-simulation models are based on household micro-data from representative sources. Disposable income is calculated for each household in the dataset by using elements of income taken from survey data (e.g. original income from employment) combined with components that are simulated by the model (taxes and benefits). The calculations are performed once for a basic scenario – in this case the tax/benefit system in place in 2003 – and then again for one or more policy change(s). These policy changes can take the form of potential reforms that policy-makers or researchers might be interested in, or they can take the form of real changes from one year to the next – in this case the tax/benefit changes between 2003 and 2005.

The basic output from EUROMOD is the micro-level change in household disposable income resulting from changes in taxes and/or benefits. This provides the basis for calculating:

- impacts on measures of poverty and inequality
- differential effects on groups of socio-economic interest, classified by individual or household characteristics
- estimates of aggregate effects on state revenue and expenditure

The areas of policies covered by EUROMOD include social security contributions (both employee and employer contributions[3]), income tax, and cash benefits. Not covered, for example, are indirect taxes (e.g. value added tax) and benefits in kind (e.g. free access to health and education services). Furthermore, the underlying micro-data does not usually include information on social insurance contribution histories, so it is not possible to fully simulate social benefits that are

[2] For a detailed description of EUROMOD see Sutherland [2001]; for a discussion of the applicability of indicators of social inclusion in EUROMOD see Atkinson [2002].

[3] As social security contributions by employers do not affect disposable income, they are not included in this paper.

contributory (pensions,[4] unemployment benefits, sickness benefit, maternity benefit, etc.). These are, therefore, drawn directly from the data. On the other hand, simulated benefits are fully simulated, which means that possible non-take-up by eligible persons is not taken into account (this is especially the case of social assistance). Measures of poverty and inequality in income contribution consequently tend to indicate lower values than in the underlying original datasets.

Measuring the 'pure' impact of policy changes

A common approach to analysing the effect of reforms of the tax/benefit system is to use income data for successive years. However, a change observed by this method reflects not only the impact of policy reforms but also the impact of other influences, such as changes in the level of economic activity, changes in demographic composition, or changes in the distribution of sources of primary income.[5] It is difficult or impossible to break down the observed change into the individual parts stemming from each particular influence, not least because they are not independent of each other. However, static micro-simulation models, such as EUROMOD, facilitates an approach in which most influences are held constant and we are then able to focus on the 'pure' effect of the reforms of the tax/benefit system (the day-after effect). In other words, we ask what would have happened if nothing but policy rules had changed. This is achieved by comparing outcomes of applying the 2003 tax/benefit rules and the 2005 tax/benefit rules on the same micro-data (for 2003) to analyse the policy reforms between 2003 and 2005. In this way we can measure the 'first-order' or 'over-night' effects of moving from the 2003 to the 2005 tax/benefit system, abstracting from the effects of demographic, macro-economic, and behavioural changes [cf. Sutherland 2002].

Concepts and definitions

Throughout this article we use equivalised incomes, taxes, and benefits. This means that we sum up, for example, the disposable income of all household members and then assign a proportion of this sum to each household member. The proportion is computed by dividing the household sum by a factor that accounts for economies of scale, i.e. the fact that larger households are better off than smaller ones owing to the sharing of certain resources (e.g. heating).[6] Exceptions to this rule are made in Figure 1, where, for obvious reasons, unequivalised

[4] In our case, only the pension top-up is simulated.

[5] See Immervoll et al. [2006] for an assessment of these influences.

[6] We use the modified OECD equivalence scale as the divisor, which gives a weight of 1 to the first adult in the household, a weight of 0.5 to each additional adult, and a weight of 0.3 to each child (under 14 years of age).

income is used, and in Table 8, where, again for obvious reasons, unequivalised taxes and benefits are used.

Income deciles are defined by proportionally dividing the population into ten groups according to their equivalised disposable household income. Poverty is assessed using poverty rates that indicate the share of persons with equivalised disposable income below the poverty line. The poverty line is defined as 60% of median equivalised disposable income. As we are aiming to measure the 'overnight' effect of policy changes based on the situation in 2003, i.e. their effect if nothing else had changed, we 'retain' the poverty line and do not recalculate it after simulating the reforms. The 'sense of (relative) poverty' consequently also remains the same. With this measure, more substantial decreases in poverty rates are to be expected, since higher incomes do not affect the poverty line.

To apply the 2005 policy rules to the 2003 data, monetary values are uprated using the consumer price index to account for inflation. Thereafter, for the purpose of comparison, all results are adjusted to 2003 prices. For the household type, we define children according to the eligibility criteria of the family allowance (*Familienbeihilfe*), i.e. persons under the age of 18, or under the age of 26 if enrolled in full-time education, and not exceeding a certain income limit.

Depending on the perspective, pensions can be classified as benefits or original income. We regard pensions as 'state-forced savings' and count them – with the exception of the pension top-up (*Ausgleichszulage*) – as part of the original income and not as benefits.[7] On the other hand we regard the child tax credit (*Kinderabsetzbetrag*) as a benefit, as it is granted as a transfer (negative tax paid together with the family benefit) independent of the tax liability and with no influence on it.

Austria in a European context

This section is not intended to be a comprehensive analysis of Austria's position in Europe with regard to the structure of taxes and benefits and its situation with regard to social inclusion and income distribution, as that would go beyond the scope of the article. The aim instead is to provide a general picture by looking at important and frequently used indicators.

Size and structure of taxes and benefits

The size of the public sector in terms of revenues and social expenditures is comparatively large in Austria. On the revenue side, in 1998 the level of taxation (including social security contributions) amounted to 43.9% of GDP. After reaching

[7] As the only exception in the international comparison in Figure 1, pensions are counted as benefits (for technical reasons).

Table 1. Size of public sector revenues and social expenditures in % of GDP[8]

	1998		2003	
	Revenues	Social expenditure	Revenues	Social expenditure
Austria	43.9	28.4	42.9	29.5
OECD Europe	38.6		38.3	
EU-15	40.3	27.5	39.7	28.3 (EU-25: 28.0)

Source: European Commission/Eurostat [2006]; OECD [2006].

a peak in 2001, it decreased to 42.9% in 2003 and, mainly owing to the 2004/2005 tax reform, it decreased to 41.9% in 2005, but is still above the OECD-Europe and the EU-15 averages. However, the composition of public revenues implies a rather low rate of progression: the share of progressive taxes on income and profits plus taxes on property amounts to only 31%. The share on the OECD-Europe and EU-15 average is considerably higher (37–38%) [OECD 2006].

The level of social expenditure in relation to GDP in Austria is somewhat above the EU average. In 1998 it amounted to 28.4% of GDP and increased mainly as a result of the extension of family benefits by 1.1 percentage points to 29.5% in 2003. The higher social expenditure in comparison to other European countries can basically be explained by the high expenditure in the categories 'old age and survivors' and 'family' [European Commission/Eurostat 2006].

Focusing in more detail on the instruments analysed in this paper, i.e. social security contributions, income taxes, and cash benefits, with regard to social security contributions we find a relatively stable rate at a high level of more than 14% of GDP in Austria, which is still clearly above the OECD-Europe and EU-15 averages. The upper contribution limit leads to the regressive impact of social security contributions, as in relation to income it puts a heavier burden on low income groups than on higher income groups. On the other hand, the size of the revenues from (progressive) taxes on income and profits is closer to the OECD-Europe and EU-15 averages, but tends to remain below them. The latest tax reform reduced the share in the GDP to 12.0% in 2005 [OECD 2006].

The major part of total social expenditures consists of monetary transfers, which in Austria are around 72% and in the European Union around 68%. Again, in Austria the rate of cash benefits as a percentage of GDP is higher than the EU average, and after the extension of family benefits in 1999/2000 it amounted to

[8] No data is yet available for 2005.

Table 2. Social security contributions, income and profit taxes, cash benefits in % of GDP[9]

	1998			2003			2005		
	Social security contrib.	Income and profit taxes	Cash benefits	Social security contrib.	Income and profit taxes	Cash benefits	Social security contrib.	Income and profit taxes	Cash benefits
Austria	15.1	12.9	19.8	14.5	12.7	20.5	14.4	12.0	n/a
OECD Europe	11.2	13.4		11.1	12.6		n/a	n/a	
EU-15	11.4	14.5	18.1	11.4	13.4	18.3 (EU-25: 18.1)	n/a	n/a	n/a

Source: European Commission/Eurostat [2006], OECD [2001, 2006].

more than 20% in 2003 [European Commission/Eurostat 2006]. No correspond ing data for 2005 are available as yet, but monetary transfers derived from the system of national accounts indicate a decrease by 0.5 percentage points in 2005 [BMSG 2006; Statistik Austria 2006b].

The expenditure side of the Austrian welfare state is characterised by the principle of horizontal equity. While in the EU-25, only a small share of cash benefits goes to means-tested benefits, in Austria the share (4%) is even smaller than the EU average (8%) [European Commission/Eurostat 2006]. In Austria the cash benefits are dominated by benefits within the social insurance system, which are related to past income levels: including pensions for civil servants, the share reaches 70% of all cash benefits. The second-largest type are universal benefits (mainly family-related), at a share of 15%.

In 2003, almost two-thirds of the cash benefits were made up of old age and survivor benefits, 13% are family transfers, 10% invalidity benefits, 6% unemployment benefits, 5% cash benefits connected with sickness and 1% are other transfers. Since 1998 family benefits exhibited the biggest increase [BMSG 2006].

To this point we have been looking at the Austrian tax/benefit system from a macro-economic perspective. Now we will apply EUROMOD to look at the micro-economic side. EUROMOD covers all EU-15 member states. It constitutes a knowledge base on different national structures and policy systems within a comparative framework.[10] We use it to analyse the micro-economic effects of so-

[9] For 2005, no data is yet available on the European level.

[10] EUROMOD relies on micro-data from twelve different sources from fifteen countries. None of the data providers bear any responsibility for the analysis or interpretation of the data reported here.

cial security contributions, income taxes, and cash benefits in a European context and compare the composition of a standardised EUR 100 of disposable income in 1998.[11]

Figure 1 shows the results for an average household and for low- and high-income households. For seven countries (Austria, Finland, Greece, Ireland, Italy, Portugal, United Kingdom) market income constitutes on average between 95% and 105% of disposable income, meaning that in these countries the state 'takes away' about the same amount in taxes and employee contributions as it 'provides' in cash benefits. In Austria, the share of cash benefits (including pensions) slightly outweighs social security contributions and income taxes. On the contrary, in the EU-15 the average market income is slightly higher than disposable income, and, like in Austria, slightly more emphasis is put on the role of income taxes than on that of social security contributions.

For households in the bottom decile, market incomes and state transfers each account for approximately 50% of disposable income in six EU-15 countries (Austria, France, Greece, Luxembourg, Spain, and Sweden). This is also the case for the EU-15 average. In Austria people in the lowest income decile pay only social security contributions and almost no taxes, whereas on average in the EU-15 the share of each of the two instruments is almost equal.

Looking at households in the top decile, in practically all countries the share of income taxes to be paid is higher than the share of social security contributions. This relates to upper contribution limits for social security contributions and to progressive income tax scales. An interesting pattern is that the share of benefits is considerably higher in Austria compared to other countries. In part this can be explained by the fact that income is more equally distributed than in other EU countries, but it is also a reflection of the importance of social-insurance related and universal benefits in Austria. Moreover, in Austria public pensions – especially of civil servants – form a considerable portion of disposable income in the top decile, while in other countries public pensions are of less importance for the top decile.

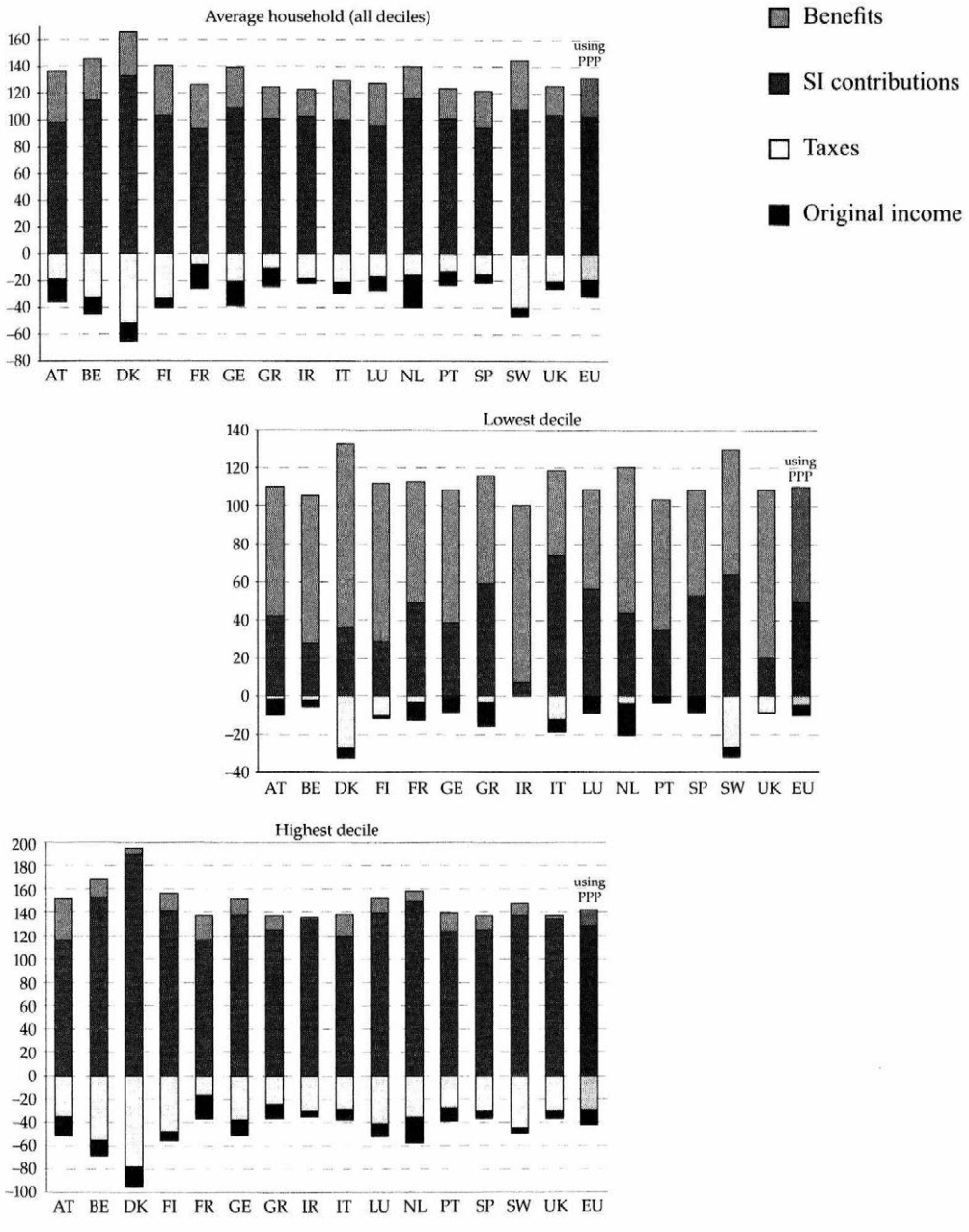
Poverty rates and inequality of income distribution

According to European convention, 60% of the median equivalised income constitutes the at-risk-of-poverty threshold, which in 2003 in Austria was EUR 10 182 for a one-person household per year (1998: 8628).[12] About 13% of people in Austria

[11] Note that in the scope of the model major parts of taxes (e.g. indirect taxes) and benefits (e.g. benefits in kind, public services) are not included. Public pensions are classified as benefits here.

[12] In this paper the year relates to the year the incomes refer to. As Eurostat defines the year after the year the data was gathered (= income year+1), the listed figures can be found under the year 2004 (incomes 2003) on the Eurostat website.

Figure 1. Composition of EUR 100 of disposable income in Austria and other EU countries, 1998



Note: Income components are based on unequivalised household disposable income; pensions are classified as benefits.
Source: Euromod (Christine Lietz's calculations).

Table 3. Poverty rates in Austria and in the EU, 1998 and 2003 (%)

	1998					2003				
	Total	Men	Women	<16	>64	Total	Men	Women	<16	>64
Austria	12	10	14	14	24	13	11	14	15	17
EU-25	16	15	17	19	17	16	15	17	20	18
EU-15	16	15	17	19	17	17	15	18	20	19
EU-10	n.a.	n.a.	n.a.	n.a.	n.a.	16	16	16	22	9

Note: Poverty rate: share of people living in households with disposable income below the poverty line; poverty line: 60% of median equivalised disposable household income.
Source: Eurostat-New Cronos [2007].

Table 4. Gini-coefficients in Austria and in the EU, 1998 and 2003

	1998	2003
Austria	0.26	0.26
EU-25	0.29	0.30
EU-15	0.29	0.30
NMS-10	nd	0.30

Note: Based on equivalised disposable household income.
Source: Eurostat-New Cronos [2007].

were living in households with an equivalised income below the threshold (1998: 12%). In a European comparison this at-risk-of-poverty rate is relatively low, at 3 to 4 percentage points below the EU-25 and EU-15 averages. Both in Austria and on the European average, at-risk-of-poverty rates are higher for women than for men.

Table 3 also shows the at-risk-of-poverty-rates for children (in this case defined as persons under the age of 16) and elderly people (aged 65 and over) in contrast to the rates for the whole population. In Austria, both children and, in particular, elderly people face a higher at-risk-of-poverty rate than the total population. With regard to child poverty, Austria ranks consistently lower than the EU average, while in terms of old-age poverty Austria found itself clearly above the EU average in 1998 but slightly below it in 2003 [Eurostat-New Cronos 2007].

Not just overall poverty rates are lower, but also the disposable equivalised income of households is more equally distributed in Austria than on the European average. The Gini-coefficient shows the percentage of income concentration, which amounts to 26% in Austria. On average in the EU it amounts to about 30%.

To sum up, the amount of the social security contributions and income and profit taxes on the one hand and cash benefits on the other is relatively large in Austria. This means that on average the state draws a relatively high share of market incomes in the form of contributions and taxes but also provides a relatively high share of cash benefits to private households. In contrast to the other European countries, (basically regressive) social insurance contributions play a more important role than (progressive) taxes on income and profits. Both at-risk-of-poverty rates and the inequality of income distribution (measured in equivalised disposable income) are below the EU average.

Changes in tax/benefit policies 2003–2005

In this chapter, we will first describe the most important policy changes implemented between July 2003 and June 2005 in Austria, which are covered by the analysis. Thereafter, the main part of this chapter refers to the distributional consequences of the implemented policy reforms.

Description of the changes taken into account in the analysis

In the period under review the main changes in tax/benefit policies were introduced in the 2004/2005 tax reform. Contributions to health insurance were also raised and some small changes took place on the benefit side.

Regarding social insurance contributions, while in 2003 employees were required to make contributions between 17.65% (white collar) and 18.2% (blue collar) of gross income for social security, subsidised housing and compulsory contributions to the legal representation of interests, in 2005 these contributions amounted to between 18.0% (white collar) and 18.2% (blue collar). The increase of the total contribution rate is a result of the increased contributions to health insurance, which affected pensioners (who pay only contributions to health insurance), the self-employed, farmers, and civil servants, who have their own contribution rates. Table 5 contains the changes for the most important groups:

In general these changes led to a heavier burden on all groups, with pensioners being the most affected. Because of the upper contribution limit, the changes tend to have a (small) regressive impact.

With the objective of increasing the employment rate of the elderly and extending their participation in the labour market, alongside other measures, contributions to unemployment insurance were abolished for female employees above 56 years of age and male employees above 58 years of age. This measure benefits elderly employees and consequently usually people with higher incomes.

In the course of the pension reform in 2004, the pension contributions of active federal civil servants were again differentiated. Within the group of civil serv-

Table 5. Contributions to health insurance 2003 and 2005 in % of gross income[13]

	Blue-collar workers	White-collar workers	Self-employed	Farmers	Civil servants	Pensioners
2003	3.95%	3.40%	8.90%	6.40%	3.95%	3.75%
2005	3.95%	3.75%	9.10%	7.50%	4.10%	4.95%

Source: HV SV [2003, 2005].

ants, this meant a (slight) redistribution in favour of younger groups with less income.

In 2004 the pension contribution rate for federal civil-servant pensioners was raised by one percentage point to (depending on the date of retirement) 3.1% or 3.3%.

In 2005, the upper contribution limit for social security contributions was raised, extraordinarily, by 5.2% [BMSG 2006]. This puts a somewhat higher burden on higher income groups.

The 2004/2005 income tax reform was introduced in two stages. Within the first stage tax credits targeting families were further increased: Supplements with regard to the number of children were added to the single-earner/single-parent tax credit (thus far at a uniform EUR 364 per year), which are also paid as negative tax:

- EUR 130 for the first child,
- EUR 175 for the second child, and
- EUR 220 for each additional child.

In addition, the income limit for the spouse for the single-earner tax credit was increased from EUR 4400 to EUR 6000 per year, if the couple has at least one child.

The second stage of the 2004/2005 tax reform integrated the increased general tax credit into the regular income tax schedule. The tax schedule was reduced to four income brackets with three marginal tax rates from 38.33% to 50%,[14] and the tax-free zone was enlarged [Breuss et al. 2004; BMSG 2004].

The tax reform results in about 350 000 persons more who owing to low income do not have to pay income tax; out of the about 5.9 million people subject to income tax, about 2.55 million are exempt from paying tax. However, as the general negative tax was not increased, people without or with very low income are not relieved by the tax reform.

[13] Excluding contributions by employers.

[14] However, a special flat rate of 6% applies to the 13th and 14th salary payments of employees and lowers the marginal tax rates.

Table 6. Income tax: tax rates and bands

Up to 2004*		Since 2005**	
Tax bands	Rate	Tax bands	Rate
For the first EUR 3640	0%	For the first EUR 10 000	0%
For an additional EUR 3630 (up to EUR 7270)	21%	For an additional EUR 15 000 (to EUR 25 000)	38.33%
For an additional EUR 14 530 (to EUR 21 800)	31%	For an additional EUR 26 000 (to EUR 51 000)	43.60%
For an additional EUR 29 070 (to EUR 50 870)	41%	For all additional amounts	50%
For all additional amounts	50%	–	–

Note: Income liable to tax: gross income minus social security contributions; * General tax credit not integrated; ** General tax credit already integrated.
Source: Einkommensteuergesetz (Income Tax Act), § 33 [2003, 2005].

The highest relative tax savings occur at a yearly taxable income of EUR 11 000 (6.1%). The savings are reduced to 0.7% when income increases to EUR 22 000 and slightly rise again to 1.6% when income increases to EUR 35 000. For higher incomes the savings drop continuously. In comparison to 2003, up to a yearly income (gross minus social insurance contributions) of EUR 50 000, the fiscal drag is compensated for all income recipients [Breuss et al. 2004]. The changes concerning the single-earner/single-parent tax credit also improved the situation of single parents, who are exposed to an above-average risk of poverty.

The changes in cash benefits affected pensions and family benefits. The cumulated increase of the pension top-up between 2003 and 2005 (3.0% for single persons) was higher than the increase for average pensions but below the development of the consumer price index (cumulated 4.4%). However, in 2004, there was an extraordinary increase in the pension top-up for couples of 5.1% [cf. HV SV 2006: 89]. In the period under investigation only the financial safeguarding of low pensions of couples was secured.

In the area of family-related benefits only minor changes occurred between 2003 and 2005. In general, the changes were more in favour of low-income groups but were small in extent:

- in 2004 the childcare benefit was increased by 50% for multiple births;
- for the means-tested supplement to the childcare benefit (approx. EUR 181 per month) the personal income limit was increased from EUR 3997 to EUR 5200 per year in 2004;
- along with the extraordinary increase of the upper contribution limit for social security contributions, the limit of the yearly taxable family income for eligi-

bility for the surcharge on family allowance with three or more children was increased by 5.2% in 2005 [AK 2004, 2005].

Besides these small changes, the main family benefits (family allowance, child tax credit, childcare benefit) were neither changed nor 'indexed' in the period between 2003 and 2005. In Austria, family benefits are generally not indexed, which means that (without reforms) the benefit amounts proportionally fall short of other incomes.

Empirical findings

Table 7 shows the population broken down into different groups (by gender, age and household type) and the averages of these groups' equivalised disposable household incomes per month in the year 2003. Persons living in single-parent households (78% of total average income) and persons living in households of couples with three children or more (80% of total average income) are the poorest population groups under consideration. The group with the highest income are persons in non-single households without children (111% of total average income).

Children (under the age of 18) have a lower income than the population average, while the elderly (60 years and older) are slightly above the population average. Moreover, there is a gap between the disposable household income of women (98% of total average) and men (102% of total average).

Looking at income deciles, the total average income is exceeded in the 7th decile. In the lowest decile the average income is less than half of the total average (44%), and in the highest decile more than twice of the total average (206%).

Looking at the effects of changes in the tax/benefit system, Figure 2 shows changes in household disposable income. On average, the policy reforms between 2003 and 2005 resulted in a 0.4% increase of disposable household income. Figure 2 shows no clear pattern with regard to progressivity. While there is almost no change in the top and the bottom deciles, the lower deciles gain slightly more than the higher deciles with the highest gains in decile 3 (plus 0.9%). This pattern is caused by the interaction of the reliefs stemming from the tax reform in 2004-2005 and the non-indexation of family benefits; the latter leads (isolated from other changes) to losses in real income (see below).

The reduction in disposable household income owing to the non-indexation of family benefits becomes more evident when the changes in disposable income are regarded from the perspective of different household types. Households without children gain on average more than household types with children. However, the differences are not very large (multiple-person households without children gain 0.6%, singles 0.4%).

The same is true for differences with respect to age groups: people of working age gain slightly more (plus 0.5%) than children (plus 0.3%) and the elder-

Table 7. Average equivalised disposable income by population group, 2003

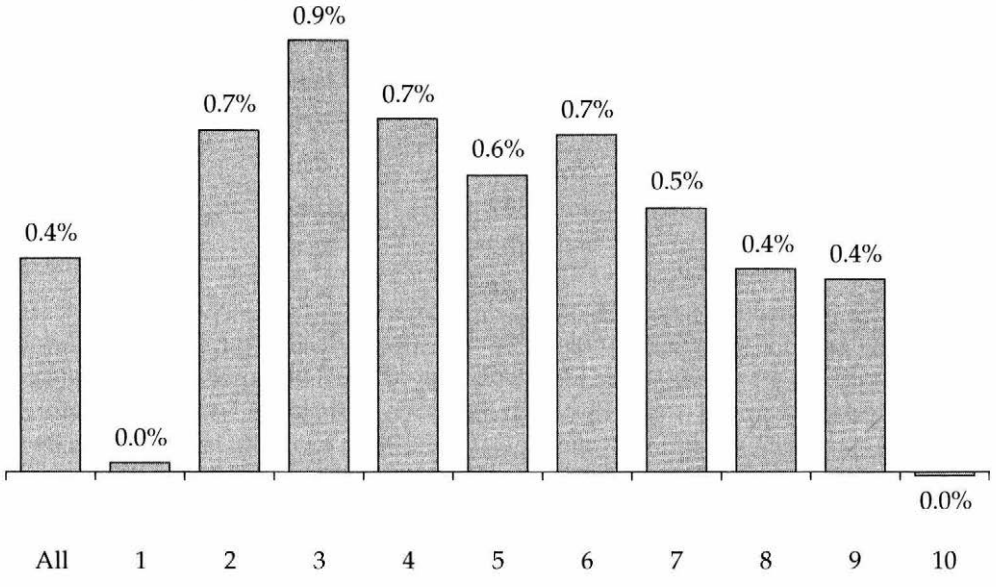
	Share of population	In EUR monthly	% of total average
All	100.0%	1641	100.0%
Decile 1	10.0%	725	44.2%
Decile 2	10.0%	973	59.3%
Decile 3	10.0%	1140	69.5%
Decile 4	10.0%	1276	77.8%
Decile 5	10.0%	1417	86.4%
Decile 6	10.0%	1573	95.9%
Decile 7	10.0%	1735	105.7%
Decile 8	10.0%	1940	118.2%
Decile 9	10.0%	2250	137.2%
Decile 10	10.0%	3381	206.1%
Hh type*: single	14.5%	1574	95.9%
Hh type: single parent	3.9%	1284	78.2%
Hh type: ma no child	34.9%	1819	110.9%
Hh type: ma 1–2 children	37.5%	1618	98.6%
Hh type: ma 3+ children	9.1%	1313	80.0%
Age 0–17	20.4%	1471	89.6%
Age 18–59	58.6%	1694	103.3%
Age 60+	21.0%	1657	101.0%
Female	51.4%	1608	98.0%
Male	48.6%	1675	102.1%

* Hh=household; ma = more (than one) adult; share of persons living in such an hh.
Decile groups based on equivalised disposable household income.
Source: Euromod based on EU-SILC 2004 (authors'calculations).

ly (plus 0.4%). This may be explained by the non-indexation of family benefits on the one hand and the raise in health insurance contributions, which affects the elderly over-proportionally, on the other.

Figure 3 shows the effect of the policy reforms on poverty rates. Considering the modest impact of the reforms on income distribution, and taking into account the confidence interval (95%), the policy changes in the period under investigation had no influence on poverty rates in general. Poverty rates did not change significantly according to age and gender either. If we look at different

Figure 2. Average percentage change in real disposable income 2003–2005, decile groups

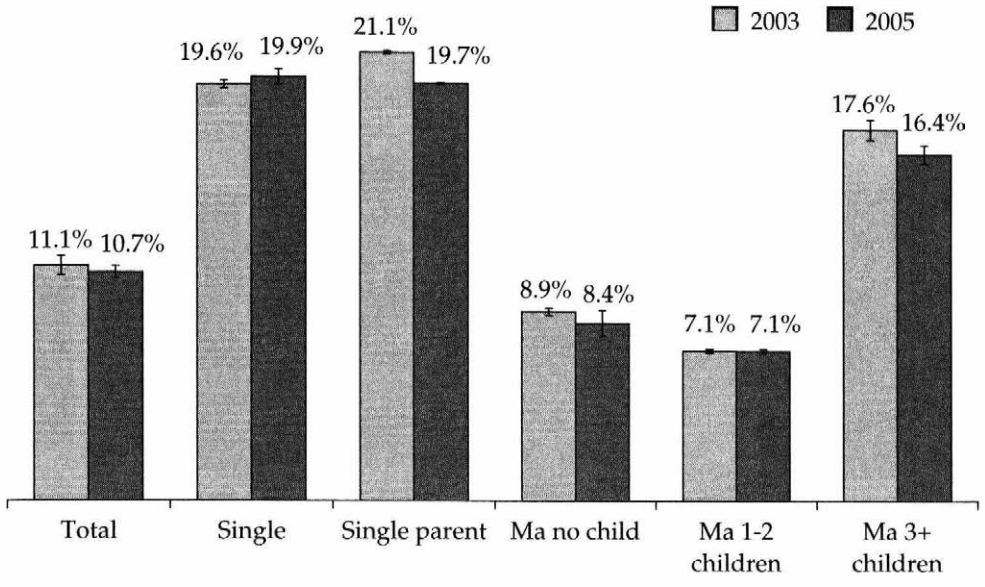


Note: Decile groups based on equivalised disposable household income in 2003.
Source: Euromod based on EU-SILC 2004 (authors' calculations).

household types, some poverty reduction (more than one percentage point based on a 'retained' poverty line) for single parents and couples with three or more children can be observed. Here, the extension of the single-parent/single-earner tax credit including negative tax is decisive.

We now turn our investigation to an assessment of the instruments driving the changes. Following the previous analysis it can be assumed that, as regards changes in income distribution, the effect of the reliefs provided by the 2004/2005 tax reform on the one hand and of the non-indexation of family benefits between 2003 and 2005 on the other hand is counteracting. In addition, for specific population groups, specific policy changes (e.g. the extension of the single-parent/single-earner tax credit for single parents and couples with three or more children, or the increase in health insurance contributions for the elderly) seem to play a role. To assess the contribution of different groups of instruments to overall changes in more detail, we split total changes in disposable income into changes related to social security contributions, income taxes and cash benefits. This analysis is accompanied by an analysis of the share of social security contributions, income taxes, the cash benefits paid/received by each income quintile, and the respective changes between 2003 and 2005, and an assessment of the redistributional effect of each instrument group over time.

Figure 3. Change in poverty rates 2003-2005, household types



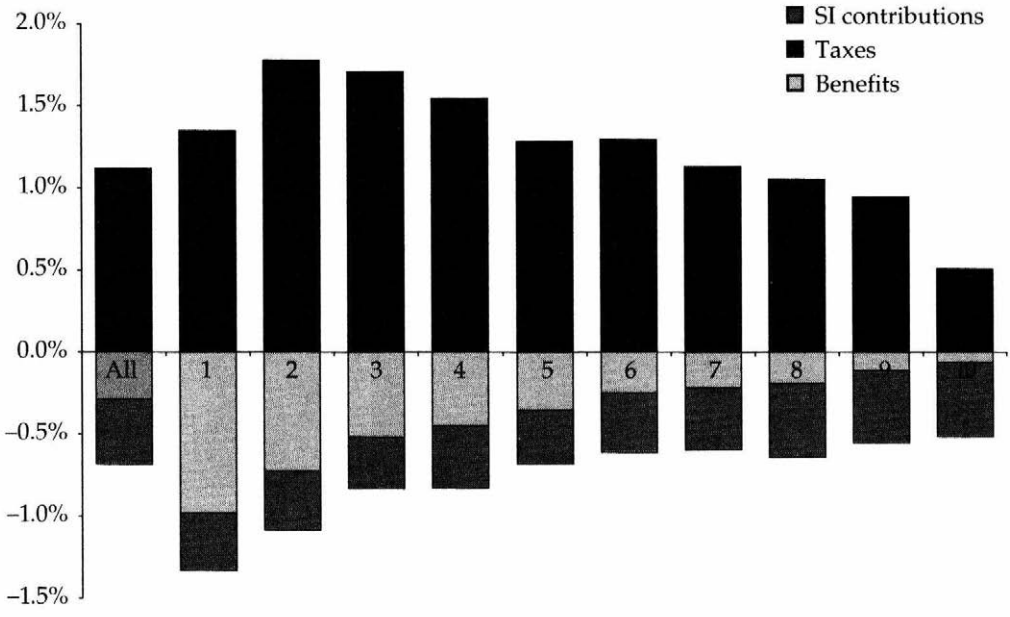
Note: ma = more (than one) adult; Poverty rate: share of people living in households with disposable income below the poverty line; Poverty line: 60% of median equivalised disposable household income in 2003; Statistical reliability of the estimates is shown using confidence intervals at the 5% level
Source: Euromod based on EU-SILC 2004 (authors' calculations).

Figure 4 presents the average changes in disposable income per decile (as in Figure 2); the different colours indicate the composition of these changes. From the perspective of households, increases in benefits and decreases in social security contributions and income taxes are presented on the positive side (above the 0.0%-line); in the same sense, decreases in benefits and increases in social insurance contributions and income taxes are shown on the negative side (below the 0.0%-line).

In sum, increases in disposable income stem from tax reliefs (the 2004/2005 tax reform). In contrast, decreased benefits – mainly due to the non-indexation of family benefits – and increased social security contributions, i.e. health insurance contributions, decrease disposable income. However, on average the gains derived from tax reliefs outweigh these losses. The 2004/2005 tax reform noticeably strengthened household disposable income.

However, particularly for the bottom decile, gains from paying less tax are equalised by losses in benefits and increases in social security contributions. On the one hand, this development is due to the fact that the 2004/2005 tax reform did not increase the general negative tax (only the income bracket eligible for

Figure 4. Average percentage change in real disposable income 2003–2005, decile groups



Note: Decile groups based on equivalised disposable household income in 2003.
Source: Euromod based on EU-SILC 2004 (authors' calculations).

the negative tax was extended). Consequently, the tax reform does little to provide relief to people without or with very low incomes [Breuss et al. 2004]. On the other hand, children are more concentrated in the lower income deciles and income from family benefits forms quite an important part of the total income in these households. Therefore, the non-indexation of family benefits has a stronger impact on low incomes.

For income deciles above the second decile – following the structure of the tax reform – the gains from the tax reform decrease continuously, but so do the losses derived from the non-indexation of family benefits. In terms of higher social security contributions, the higher income deciles are also affected by the extraordinary rise in the upper contribution limit. As a result, in the highest decile the increases in social security contributions almost make up for the gains stemming from the tax reform.

Regarding different household types households with children experience somewhat higher gains in tax reliefs, as some of them are especially targeted at families with children, like the additional amounts for children within the single-earner/single-parent tax credit. However, in real income terms these gains are substantially reduced by reductions in family benefits.

Table 8. Share of instrument per income group, 2003 and 2005 (%)

	2003			2005		
	Social security contributions	Income taxes	Cash benefits	Social security contributions	Income taxes	Cash benefits
Quintile 1	6.2	1.9	31.6	6.3	1.2	31.7
Quintile 2	12.7	6.8	22.1	12.7	5.9	22.1
Quintile 3	18.3	12.2	18.6	18.2	11.7	18.5
Quintile 4	24.7	20.2	15.4	24.6	20.1	15.4
Quintile 5	38.1	58.9	12.2	38.1	61.1	12.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

Note: Quintile groups based on equivalised disposable household income in 2003 and 2005.
Source: Euromod based on EU-SILC 2004 (authors' calculations).

When the changes in disposable household income are analysed by age groups, it can be observed that the gains from the 2004/2005 tax reform are more or less equally distributed among the age groups. The differences lie in the reductions of disposable income caused by the non-indexation of family benefits and the increase in social security contributions. Clearly, children are most affected by the non-indexation of family benefits. On the other hand, the elderly are strongly affected by the increase in health insurance contributions, as pensioners were the group with the highest increase in contributions, and these contributions play quite an important role in relation to their total income.

When the changes in disposable household income between 2003 and 2005 are broken down according to the different tax-benefit instruments, we can analyse the development in the share of social security contributions, income taxes, and cash benefits paid/received by each income quintile. In general, it is evident that lower income groups receive a higher share in total cash benefits than the share of the total social security contributions and total income taxes they have to pay, whereas for higher income groups the opposite is true.

In 2003, the bottom quintile paid 6% of all social security contributions and 2% of all income taxes and received 32% of all cash benefits. In contrast, 12% of all cash benefits went into the top quintile, while it made 38% of all social security contributions and 59% of all income taxes.

Looking at the development between 2003 and 2005, there was practically no change in the distribution of social security contributions and cash benefits across income quintiles. This can be explained by the fact that health insurance

Table 9. Redistributional effect of tax/benefit-instruments, 2003 and 2005

	2003					
	Gini pre	Gini post	RS index*	Rate**	Kakwani index	Reranking index
SIC***	0.337	0.340	-0.002	0.135	-0.013	0.002
Std.error	0.00568	0.00563	0.00001	0.00064	0.00003	0.00004
Taxes	0.340	0.295	0.047	0.179	0.217	0.002
Std.error	0.00168	0.00155	0.00014	0.00098	0.00075	0.00002
Benefits	0.295	0.239	0.064	0.110	0.640	0.008
Std.error	0.00035	0.00012	0.00122	0.00180	0.00296	0.00075

	2005					
	Gini Pre	Gini post	RS index*	Rate**	Kakwani index	Reranking index
SIC***	0.337	0.340	-0.002	0.138	-0.014	0.001
Std.error	0.00621	0.00759	0.00138	0.00225	0.00873	0.00001
Taxes	0.340	0.292	0.050	0.169	0.247	0.002
Std.error	0.00217	0.00116	0.00098	0.00069	0.00359	0.00002
Benefits	0.292	0.238	0.061	0.106	0.637	0.007
Std.error	0.00171	0.00223	0.00124	0.00240	0.00001	0.00072

* Reynolds-Smolensky index
** size of instrument in percentage of base
*** social insurance contributions
Source: Euromod based on EU-SILC 2004 (authors' calculations).

contributions were raised for all population groups – the differences are related to different occupational groups but not to income groups. In the case of benefits, some minor changes and the general non-indexation of family benefits did not change the distribution across the income quintiles.

On the income tax side, the 2004/2005 tax reform led to small changes in the distribution across income quintiles: the proportion of taxes paid by the top quintile (up two percentage points) increased in favour of the lower four quintiles. This is due to the structure of the tax reform with the extension of the tax-free zone on the one hand and the retention of the 50% marginal tax rate for high incomes on the other hand, leading to continuously decreasing gains from the tax reform for higher incomes.

The above results concerning the distribution of the instrument groups across income quintiles suggest that the progressivity of income taxes increased slightly, whereas there was no change in the progressivity of social security contributions and cash benefits. To evaluate whether this first assessment can be proved, Table 9 shows the standard measures for redistribution.

The Reynolds-Smolensky Index of Redistribution represents the difference between income inequality before and after applying an instrument, measured by the Gini-coefficient and the 're-ranking' index. The redistributive effect indicated by the index can be further broken down into progressivity and 'importance'. Progressivity indicates the 'pro-poor' nature – if for example taxes or contributions are disproportionately higher in the upper (lower) part of income distribution, then they are progressive (regressive). We measure progressivity using the Kakwani index, which is positive for progressive instruments and negative for regressive instruments. The amount of redistribution an instrument can achieve not only depends on its progressivity but also on its importance. The importance is indicated by the rate, that is, by the (average) rate that is applied to the base income for calculating the instrument. (The Appendix provides a more comprehensive description of the measures used.)

The Reynolds-Smolensky- and the Kakwani indexes demonstrate the insignificance of changes in social security contributions and cash benefits concerning redistribution. The indexes also confirm that the redistributive impact of income taxes increased with the 2004/2005 tax reform, but the rise is somewhat modest. Not surprisingly, the higher redistributional effect of income taxes stems from the higher progressivity of the instrument (indicated by the Kakwani index) and not from the 'importance' of the instrument, as tax rates were lowered. However, in terms of redistribution (under the assumption of full take-up), cash benefits are still the most important instrument. Due to the upper-contribution limit, social insurance contributions even show a regressive effect.

Conclusion

The aim of this analysis is to evaluate whether policy reforms in Austria were successful in meeting redistributive objectives and in reducing poverty. The main findings based on the tax/benefit micro-simulation model EUROMOD relating to equivalised disposable household income are:

Changes in the tax/benefit system between 2003 and 2005 (mainly the 2004/2005 tax reform and increases in health insurance contributions since 2004) led in sum to an average gain of 0.4% in disposable household income. In general, the measures had no significant impact on income distribution or poverty. While there was almost no change in disposable income in the top and bottom deciles, the lower deciles gained slightly more than the higher deciles.

On average households without children profited more than households with children. However, some poverty reduction for single parents and couples

with three or more children can be observed. With respect to age groups, people of working age gained slightly more than children and the elderly.

If we look at the instruments driving the changes, we find that all population groups benefited from the 2004/2005 tax reform. However, as the tax reform did not increase the (general) negative tax and retained the 50% marginal tax rate for high incomes, the gains are relatively low in the bottom decile, but are the highest in the second decile, from where they decrease continuously with rising income. A noteworthy finding is that increases in disposable income arising from the tax reform were to a certain extent lowered by losses in benefits (in terms of real income). These losses are due to the fact that in Austria family benefits are not 'indexed', that is, they do not rise with inflation or income growth. Consequently, benefit amounts fall proportionally short of other incomes. Especially affected were households with children, meaning that lower income groups were over-proportionally affected, as children are more concentrated in low-income households, and in the case of single parents and couples with three or more children state transfers, in particular family benefits, make up for a relatively high share of their total income.[15] However, the extension of the single-parent/single-earner tax credit in the 2004/2005 tax reform (including negative tax for families with children) supported those vulnerable groups. The elderly were mostly affected by the increase in health insurance contributions, as pensioners were the group with the highest increase in contributions, and these contributions play quite an important role in relation to their income.

In total, the preponderance of gains from the tax reform led to an increase in disposable income. However, as mentioned above, in the bottom decile the gains were fully offset, mainly owing to the losses (in terms of real incomes) caused by the non-indexation of family benefits, and in the top decile as a result of higher social security contributions connected with the extraordinary increase in the upper contribution limit.

Another important part of the analysis related to the share of instruments (social security contributions, income taxes, cash benefits) paid/received per income group and the redistributional effect of the instruments over time.[16] In general, the upper contribution limit of social security contributions and the progressive scale of income tax cause the income tax to be much more concentrated among higher income groups than social security contributions. Also, cash benefits – despite the high share of social-insurance-related and universal benefits – favour people with less income. Regarding social-insurance-related benefits, this at first glance surprising diagnosis stems from the fact that the probability of becoming unemployed or sick is higher in lower income classes. In the case of

[15] However, this has to be put into context: in Austria cash benefits for families were significantly increased until 2003 and are quite generous in an international comparison.

[16] The analysis is based on the assumption of full take-up of benefits, in particular social assistance benefits. Pensions, with the exception of pension top-up, are counted as original income.

universal family benefits, the vertical redistributive impact is caused by the distribution over the life cycle (high benefit intensity around birth, children are more concentrated in lower income groups) [Guger 1996, 1998, 2005].

In 2005, the bottom quintile paid 6% of all social security contributions and 1% of all income taxes and received 32% of all cash benefits. On the other hand, the highest quintile brought in 38% of all social security contributions and 61% of all income taxes and benefited from 12% of all cash benefits. Between 2003 and 2005 no substantial changes in the distribution of instruments is notable; the tax reform in 2004/2005 increased the proportion of taxes paid by the top quintile (up two percentage points) in favour of the lower four quintiles.

To refine the assessment of the distributional effects of the instrument groups, we use a range of standard measures on income inequality (e.g. the Reynolds-Smolensky Index of Redistribution based on the difference between income inequality before and after applying an instrument). Cash benefits have both in 2003 and 2005 the highest redistributive impact of the three instruments, although the redistributive impact of income taxes was slightly raised after the 2004/2005 tax reform. Social security contributions – owing to the upper contribution limit – even have a slightly regressive impact and showed no changes in the period under investigation. In sum, the size of the redistributive impact from high to low income classes is considerable. Measured by equivalised household income, the Gini for original gross income stands at 0.34 in comparison to 0.24 for net disposable income.

To conclude, our analysis indicates that tax/benefit reforms between 2003 and 2005 – despite producing an average increase of disposable income – had no strong impact on income distribution and poverty. It is noteworthy that the reforms were not budget neutral but were implemented at the cost of a higher budget deficit. However, the effect of the 2004/2005 tax reform will be compensated after 2005 by the fiscal drag. Our investigation also indicates that there is still a comparatively high poverty rate among vulnerable groups like single parents and couples with three or more children. This means that it is still necessary to put combating poverty and social exclusion at the centre of political efforts.

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Appendix: Measures of redistribution

The measures of income redistribution and progressivity used in this paper are based on a family of indices based on the single-parameter Gini (or S-Gini) [Donaldson and Weymark 1980; Yitzhaki 1983]. The redistributive effect, Π^{RE}, of taxes and/or benefits is measured as the difference between the Gini coefficients of income before and after taxes and/or benefits. This difference can be decomposed into *vertical equity* and *re-ranking*. Vertical equity is measured by the Reynolds-Smolensky index, Π^{RS}, [Reynolds and Smolensky 1977] which is defined as the difference between the Gini coefficient for income before taxes and/or benefits and the concentration index[17] of income after taxes and/or benefits. Re-ranking is measured by the re-ranking index, D, which is defined as the difference between the generalised Gini coefficient for income after taxes and/or benefits and the generalised concentration index of income after taxes and/or benefits.

$$\begin{aligned} \Pi^{RE}_{TB} &= G_X - G_{X+TB} \\ &= \Pi^{RS}_{TB} - D \\ &= [G_X - C_{X+TB}] - [G_{X+TB} - C_{X+TB}] \end{aligned} \tag{1}$$

Progressivity is measured using the Kakwani index Π^K [see Kakwani 1977]. This is defined as the difference between the generalised concentration index of taxes and the generalised Gini coefficient for income before taxes.

$$\Pi^K_T = C_T - G_X \tag{2}$$

Equation (3) shows the relationship between the Reynolds-Smolensky and the Kakwani indices:

$$\begin{aligned} \Pi^{RS}_T &= \frac{t}{1-t}\,\Pi^K_T \\ \rho^{RS}_B &= \frac{b}{1-b}\,\rho^K_B \end{aligned} \tag{3}$$

where t is the average tax rate and b the average benefit rate.

[17] The concentration index is the Gini index for the concentration curve.