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Income tax reform to relieve middle income households

By Stefan Bach and Hermann Buslei

Completely eliminating the sharp rise in the tax rate for middle income households in Germany by changing personal income tax rates would mean estimated annual losses in tax revenue of 35 billion euros, or 1.1 percent of GDP. Taxpayers with high incomes would also benefit from this type of relief. The ten percent of the population with the highest income would have a relief of around 10.4 billion euros—over 2,000 euros per taxpayer on average—while middle income taxpayers would benefit to a much lesser extent. With regard to tax burdens or taxable income, the middle and higher income segments would experience more relief than the highest income segment. If high tax revenue losses ought to be avoided and the relief to be focused on middle income taxpayers, tax rates in the upper income segments must be raised. A moderate increase in maximum tax rates would only result in limited extra revenue.

Policy makers and the general public in Germany are expressing criticism of the high tax and social security contribution burden—particularly on the middle class—more and more vociferously. Personal income tax revenue has increased significantly in recent years, not only in absolute terms but also in relation to aggregate value added. The marginal tax rates at the lowest level of the tax tables have been rising sharply for some time, showing a belly-shaped curve (Mittelstandsbauch). Since personal income tax rates have only been reduced slightly since 2010 and nominal as well as real income increased, the tax burden on the lower and middle income segments has significantly increased. These segments are viewed as the priority targets for tax relief. In view of the upcoming federal election, some politicians and associations are proposing tax relief with a magnitude of ten to 30 billion euros annually. However, the public budget has little room for maneuver; the structural budget surplus will probably drop to zero in the next few years.

Studies on the distribution of the tax burden show that households with low and middle incomes pay relatively little income tax. In these groups, indirect taxes and social security contributions make up the majority of the payment burden. This is why reducing the income tax rate for these households would not provide much relief, even if concentrated on the lowest levels of the tax tables. At the same time, rate reductions would go hand in hand with significant revenue losses because higher income households would also benefit from the cuts.

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INCOME TAX REFORM TO RELIEVE MIDDLE INCOME HOUSEHOLDS

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The lowest tax rate is 14 percent, and as income rises the marginal tax rates in the first (small) tax bracket rise sharply in order to reach 24 percent for taxable incomes just below 14,000 euros. Marginal tax rates rise much more slowly in the second tax bracket until reaching the first maximum tax rate of 42 percent at 54,057 euros. The rate remains constant in the first upper bracket. For incomes of 256,303 euros and higher, the maximum tax rate jumps to 45 percent (tax rate for the wealthy).

When the splitting method is used to tax married couples, the basic personal exemption and income limits are doubled. This relieves the tax burden of couples with single earners and is more beneficial than individual taxation for couples whose income levels are significantly different.

The basic personal allowance of 8,820 euros exempts the minimum subsistence level from tax payments. Thus, the personal income tax burden is worth mentioning starting at the level of median gross monthly income. The lowest tax rate is 14 percent, and as income rises the marginal tax rates in the first (small) tax bracket rise sharply in order to reach 24 percent for taxable incomes just below 14,000 euros. Marginal tax rates rise much more slowly in the second tax bracket until reaching the first maximum tax rate of 42 percent at 54,057 euros. The rate remains constant in the first upper bracket. For incomes of 256,303 euros and higher, the maximum tax rate jumps to 45 percent (tax rate for the wealthy).

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corresponding burden for extra income is relevant for economic decisions, such as changes in working hours
and job function, education and training, and changing jobs. Average tax rates—i.e., the tax burden with regard
to total taxable income—also rise sharply, but because the personal exemption and lower marginal tax rates pro-
vide relief, they are still significantly below the marginal tax rates. In the highest income segments, average tax
rates steadily approach the maximum tax rate. Average tax rates determine income effects, meaning how much
of their income taxpayers owe the state. They are rele-
vant for burden and distribution effects.

When determining the effective burden, the 5.5 percent
solidarity surcharge on the personal income tax burden
must be considered. It increases the marginal and aver-
age tax rates accordingly, although an exemption limit
applies for low income tax burdens.

The sharp rise in marginal tax rates until the “kink”
between the first and second bracket has a special name
in German: *Mittelstandsbauch*, as above, belly-shaped
curve. The term originated decades ago, when marginal
tax rates were defined using quadratic equations with
concave curves that rose sharply at the beginning and
continued at slower rates. As of 1990, a linear progres-
sive marginal tax function has been applied to the entire
bracket with rising marginal tax rates. When the federal
government lowered the maximum tax rate from 53 per-
cent to 42 percent in 2001, the lowest tax rate was sup-
posed to be lowered significantly as well. However, since
broader reductions in the rate function would trigger
high revenue losses in the middle income segment—as
will be shown in the following—the tax tables were only
adjusted for the lowest tax rate.

**Reform options: Tax reduction for lower
and middle income segments with possible
increase in maximum tax rates**

The following section contains our analysis of two basic
reform options (Scenarios 1 and 2) and four detailed
reform proposals from the discussion in recent months
about tax policy (Scenarios 3 to 6).

In Scenario 1, we flattened the belly-shaped curve by sim-
ulating marginal tax rates with a constant, linear progres-
sive slope between the lowest tax rate of 14 percent
and the first maximum tax rate of 42 percent. This resulted
in a significant drop in marginal and average tax rates
for lower and middle income segments. As of a taxable
income of 54,000 euros, the marginal tax rate of 42 per-

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4 The income tax tables from 1958 to the present are documented on the
Federal Ministry of Finance’s website Wage and income tax calculator (availa-
bale online, in German only) in the section “Wage and income tax calculator”.

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The sharp rise in marginal tax rates causes a belly-shaped curve (*Mittelstandsbauch*).
The personal income tax has a highly progressive effect

We analyzed the revenue and distribution effects of the personal income tax as per the current law as well as the 2017 reform scenarios using the DIW Berlin Personal Income Tax Microsimulation Model (ESTM), which is based on projected individual data from the wage and personal income tax statistics (see box). Table 2 displays the

5 Christian Social Union Party (CSU), Söder stellt “Bayern-Tarif” vor. Mega-Entlastung für Bürger, Press release, July 21, 2016 (in German only) (available online); Reuters, CSU will SoI abschaffen und Geringverdiener entlasten, July 21, 2016 (available online, in German only); Florian Dorn et al., 2016, loc. cit.

6 Also see Fabian Peters and Bernd Raffelhüschen, Aufkommenswirkung einer umfassenden Steuereform in 3 Stufen: Zum Vorschlag der Mittelstands- und Wirtschaftsvereinigung der CDU/CSU, Forschungszentrum Generationenverträge der Albert-Ludwigs-Universität Freiburg Discussion Papers 62 (2016) (PDF, available online).

7 German Trade Union Confederation (DGB), Gerecht besteuern, in die Zukunft investieren. Steuerpolitische Eckpunkte des DGB zur Bundestagswahl 2017, National DGB Board Resolution of December 6, 2016 (available online).

The DIW Berlin Income Tax Microsimulation Model (EStM)

The DIW Berlin Income Tax Microsimulation Model (EStM) analyzes the direct revenue and distribution effects of current personal income tax law and tax reforms. The model is based on a representative ten-percent sample from individual data in the 2007 wage and personal income tax statistics database and the 2008 annual personal income tax statistics (business statistics). The data sets are used in the federal states’ research data centers via controlled remote data processing.

A detailed simulation program determines the revenue and distribution effects of the stipulated income tax, including unassessed payroll tax, withholding tax, and the solidarity surcharge on these taxes. It maps the tax laws to the prevailing legislation in 2017. Initially, the adjustments in taxpayer behavior triggered by changes in the tax laws were not taken into consideration.

An extrapolation module takes important taxpayer changes by employment status and family structure (structural projection, “static aging”) and the key income variables and expenditure items (level projection) until 2017 into consideration. The projection to 2016 is primarily supported by information from the national accounts, the microcensus, revenue statistics, employment statistics, and annual population projections. For the projection period until 2017, we used current forecasts on population, the labor market, and macroeconomic development.

Since the wage and personal income tax statistics only collect tax-related data on an estimated 80 percent of households in Germany, for our distribution analyses we used information from the Socio-Economic Panel (SOEP) on households with low taxable incomes or no income at all. This allowed us to present the distribution effects for the total population.

Distribution analyses

We displayed the distribution effects of the simulation results on income tax revenue by level of total income, i.e., taxable gross income. We converted this income variable into equivalent income adjusted for household size to render all taxpayers comparable. Next, we sorted the taxpayers in ascending order according to equivalent income levels and divided them into deciles of the same size. The tenth decile is also be divided into the five percent and one percent of the population with the highest incomes.

Further, we calculated relevant analytical measurements of income concentration (Gini index) and tax progression (Suits index). Our calculations refer to gross income adjusted for household size. Above and beyond the total amount of income, we also included non-taxable gross income such as non-taxable portions of pensions or tax-exempt foreign income and wage-replacement benefits.

The Gini index was derived from the Lorenz curve illustration. It has a value range of 0 (equal distribution) to 1 (total income is concentrated on one person).

Progression indexes measure the concentration of income tax in relation to gross income. In particular, the Suits index measures tax burden concentration in relation to the concentration of gross income. It has been standardized as +1 for complete tax progression and −1 for complete tax regression.

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1 For information on the microsimulation models, see the term in the DIW Glossary „Mikrosimulationsmodelle in der Politikberatung“ (available online, in German only).

2 To do this, the total amount of income is divided by the sum of the equivalence weights of the household members to be considered. This income variable represents per capita gross income modified from a household size perspective. According to the conventional international equivalence scale (“new” or “modified” OECD scale, available online), the head of household receives a weight of 1 and the other adults in the household and children 14 and over a weight of 0.5. Children under 14 receive a weight of 0.3. We assumed a decreasing cost trend in larger households due to joint household management and differences in children’s needs. Only the household types recorded in the income tax statistics were included: single taxpayers and married couples or registered partners with their dependents. Unmarried partners, children in the household with their own taxable income or additional household members such as grandparents or other persons were excluded.

3 See Richard Ochmann and Andreas Peichl, Measuring Distributional Effects of Fiscal Reforms, (Working Paper, FiFo Institute for Public Economics, University of Cologne, no. 06–9, 2006; with literature review, PDF, available online, in German only)). We used the PROGRES STATA module for our calculations (available online).
### Revenue and distribution of personal income tax and reform scenarios 2017

<table>
<thead>
<tr>
<th>Equivalized adjusted gross income</th>
<th>Impact revenue scenarios 2017</th>
<th>Impact current reform proposals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Scenario 1</td>
<td>Scenario 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Quantiles</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper income limit, euros</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1st decile</strong></td>
<td>1,121</td>
<td>0</td>
</tr>
<tr>
<td><strong>2nd decile</strong></td>
<td>7,481</td>
<td>34</td>
</tr>
<tr>
<td><strong>3rd decile</strong></td>
<td>11,821</td>
<td>328</td>
</tr>
<tr>
<td><strong>4th decile</strong></td>
<td>16,333</td>
<td>2,477</td>
</tr>
<tr>
<td><strong>5th decile</strong></td>
<td>21,213</td>
<td>7,582</td>
</tr>
<tr>
<td><strong>6th decile</strong></td>
<td>26,578</td>
<td>14,256</td>
</tr>
<tr>
<td><strong>7th decile</strong></td>
<td>32,845</td>
<td>22,816</td>
</tr>
<tr>
<td><strong>8th decile</strong></td>
<td>41,199</td>
<td>34,655</td>
</tr>
<tr>
<td><strong>9th decile</strong></td>
<td>55,962</td>
<td>53,731</td>
</tr>
<tr>
<td><strong>10th decile</strong></td>
<td>172,984</td>
<td>120,991</td>
</tr>
<tr>
<td>91%-95% percentile</td>
<td>73,792</td>
<td>42,788</td>
</tr>
<tr>
<td>96%-99% percentile</td>
<td>147,371</td>
<td>62,877</td>
</tr>
<tr>
<td>Top 1% percentile</td>
<td>173,056</td>
<td>67,319</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>308,863</td>
<td>19,144</td>
</tr>
</tbody>
</table>

### Tax revenue, billion euros

<table>
<thead>
<tr>
<th>Tax liability per taxpayer, euros</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1st decile</strong></td>
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<tr>
<td><strong>2nd decile</strong></td>
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<tr>
<td><strong>3rd decile</strong></td>
</tr>
<tr>
<td><strong>4th decile</strong></td>
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<td><strong>10th decile</strong></td>
</tr>
<tr>
<td>91%-95% percentile</td>
</tr>
<tr>
<td>96%-99% percentile</td>
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<tr>
<td>Top 1% percentile</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

### Tax liability as percent of taxable income

<table>
<thead>
<tr>
<th>Distribution measure</th>
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</thead>
<tbody>
<tr>
<td>Gini after income tax</td>
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</table>

### Distribution and progression measures

<table>
<thead>
<tr>
<th>Distribution measure</th>
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</thead>
<tbody>
<tr>
<td>Gini after income tax</td>
</tr>
</tbody>
</table>

1 Equivalized by new OECD scale.
2 Assessed personal income tax, non-assessed wage tax and withholding capital income tax, solidarity surcharge on income taxes.

Sources: German research data centers of the statistical offices; microsimulation analysis based on income tax return data and Socio-economic Panel (SOEP) data, projected to 2017.

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results of the equivalence-weighted sums of the incomes by deciles and some percentiles at the top of the income distribution.

Totaling 309 billion euros (including unassessed payroll tax, withholding tax, and solidarity surcharge), personal income tax revenue is highly concentrated on the upper income segments. While the poorest 50 percent of the population only contribute a good ten billion euros, or 3.4 percent of the total income tax revenue, the richest ten percent pay 173 billion euros, or 56 percent of the total income tax revenue, amounting to an average of 40,000 euros per taxpayer per year. The richest one percent of the population alone pays 67 billion euros (on average, 173,000 euros per taxpayer per year).

However, the income of the well-to-do and the wealthy is also considerably higher than that of the lower income segments, so it makes sense that they pay more taxes. But as the average tax rates show, the tax burden is highly progressive in relation to income. With regard to effective economic income, however, the burdens are lower compared to taxable income. On the one hand, a variety of deductions reduce the ratio of gross income to taxable income. And on the other, tax breaks and tax avoidance can reduce the amount of income recorded for tax purposes.

**Flattening the curve provides more absolute relief to higher income segments**

Completely flattening the belly-shaped curve in the tax rates (Scenario 1) would lead to a reduction in tax revenue of 35.5 billion euros per year not taking aggregate feedback effects into account. The loss is equal to 1.1 percent of GDP in 2017. Of the total, 10.4 billion euros or 29 percent would go to the richest ten percent. The ninth income decile would be responsible for another 8.5 billion euros or 24 percent of the total. And the lower 80 percent of the income distribution would receive less than half of the total relief volume. This is because higher and high earners also benefited from tax relief, which rose to a maximum of 1,562 euros per year for single taxpayers and double the amount for married taxpayers. The relief per taxpayer in the upper deciles and percentiles was correspondingly high.

Relative to taxable income, taxpayers in the sixth to ninth deciles received the greatest amount of relief. In the upper percentiles, relative relief steadily decreased because the relief is subject to an absolute upper limit. Accordingly, the tax became slightly more progressive, as displayed in the progression index. However, the redistribution effect of the tax system was diminished due to high tax revenue losses. The Gini index after taxes rose slightly, reflecting a slight increase in income inequality. The implication here is that the tax revenue losses associated with this scenario would have to be made up by raising other taxes and social contributions or curtailing benefits, triggering other distribution effects in turn.

The CDU/CSU business association’s proposal (Scenario 4) would have a similar effect on revenue and distribution effects. At 33 billion euros annually, the loss in revenue is somewhat lower than that of Scenario 1. And as a result of the shift to the right in the income limit for the first maximum tax rate, the relief effect is a bit more concentrated on the high income segment. Accordingly, the increase in the progression indexes is a bit lower and the rise in the Gini index somewhat more pronounced. The table does not reflect the effect of the proposed increase in the child benefit. This would augment revenue losses by eight billion euros, relieving families with children distributed evenly throughout all income segments. When the larger child benefit is included, the proposal would mean annual revenue losses of 41 billion euros.

The Bavarian proposal is much more inexpensive: it would yield revenue losses of nine billion euros per year. It only shifts the kink in the curve somewhat to the right (Scenario 3). This move would have a greater relief effect on lower income segments compared to scenario 1. The progressive income tax effect would only increase slightly. The significantly lower level of relief would cause the tax system’s redistribution effect to decrease minimally, resulting in a slight increase in the Gini index.

**Raising the maximum tax rate would reduce tax revenue losses**

The revenue and distribution effect of only raising the maximum tax rate to 49 percent (without a differentiated rise in the tax rate for the wealthy) is shown in Scenario 2. This would yield ten billion euros of extra tax revenue without taking behavioral adjustments and aggregate feedback effects into consideration. Of course this would only burden high-income taxpayers. The upper one percent of the population with the highest income would bear around 70 percent of the tax increase. In this scenario, both the progressive nature of the income tax and its redistribution effect would increase. Increasing the maximum income tax rate further would yield 1.6 bil-

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9 Based on data collected on all personal income tax payments from domestic private households, i.e., income tax determined by personal tax assessment and the stipulated solidarity surcharge, unassessed payroll tax and withholding tax on the capital gains of domestic private households, and the solidarity surcharge on the unassessed payroll and withholding taxes.

lion euros in extra tax revenue per percentage point. A separate increase in the tax rate for the wealthy would yield another 0.5 billion euros in extra tax revenue. The latter change would burden the richest percent of the population only.

It is apparent that a moderate increase in the maximum tax rate would only yield limited extra tax revenue and therefore could not finance sweeping tax relief for the lower and middle income segments. To achieve that goal, the maximum tax rate would have to be raised higher and begin at a relatively low income, causing the marginal tax rate to rise significantly in the second bracket.

The DGB and the Left Party proposals would provide more relief to taxpayers in the lower and middle income segments via large increases in the basic personal exemption (Scenarios 5 and 6). The DGB scenario would result in low tax revenue losses of 3.5 billion euros annually, since it calls for only moderate reductions in the marginal tax rate for the two brackets. In this proposal, taxpayers up to the 95th percentile would experience a relief of just under 15 billion euros, while the wealthiest five percent of taxpayers would have a burden of 11 billion euros—almost ten billion euros of which would be borne by the richest one percent. The Left Party would also lower the marginal tax rates in the lower segment to the extent that taxpayers up to the 95th percentile would experience a significant relief. In this scenario, taxpayers up to the 95th percentile would have a relief of as much as 475 billion euros, while the wealthiest five percent of taxpayers would have a burden of 19 billion euros, almost all of which would be borne by the richest one percent. However, this would yield a tax revenue loss of 28 billion euros. The progression and redistribution effects of income taxes would be heightened considerably in both scenarios. The Left Party’s proposal would make the progression increase much more pronounced, and the redistribution effect would increase to a lesser extent since the tax revenue loss is much higher than that inherent in the DGB scenario.

Other aggregate feedback effects triggered by the income effects and possible taxpayer behavioral adjustments were not included in the simulation. A short-term feedback effect would directly result for indirect taxes to the extent that income tax relief or increases led to increases or decreases in taxpayer expenditure, in turn triggering further aggregate effects on demand. Furthermore, tax increases or decreases could increase or decrease avoidance reactions, changing tax revenue and impacting welfare and growth. In the longer term, changes in income distribution could also influence economic growth.11

**Conclusion**

The structural reforms to the personal income tax table being discussed in Germany right now all aim to provide relief to the middle income segment. As a result of deductions, the basic personal exemption, and the tax tables themselves, income taxes are highly progressive in Germany. This is why low income segments are hardly burdened and middle income ones moderately burdened, while high earners pay high taxes. Taxpayers with high incomes also benefit from relief measures in the lowest rungs of the tax tables, which result in considerable tax revenue losses. If these losses ought to be reduced, tax rates in the upper income segments must be raised. However, significantly raising the maximum tax rate could intensify tax-avoidance behavior, thus reducing the amount of extra revenue.

Other taxes could be raised to make up for tax revenue losses. Indirect taxes pose a relatively heavy burden for the lower and middle classes, making the tax burden distribution less progressive. Higher corporate taxes, capital gains taxes, or wealth taxes would have the reverse effect, easily triggering aggregate disadvantage and resistance from the economic elite. In the medium term, public budgets could only make do with less money to spend by either curtailing social transfers and subsidies or investment. However, these strategies typically have unfavorable distribution effects and longer-term economic disadvantages as a consequence. The remaining tax revenue losses would lower the financial balance of public budgets, resulting in lower levels of government spending or higher tax payments and social contributions in future periods.

11 Also see Hanne Abig et al., Increasing Inequality Reduces Long-term Growth. German Economic Analysis Using a Macroeconomic Structural Model, (PDF, Friedrich Ebert Foundation, 2016) (available online).