

Bartels, Charlotte; Schröder, Carsten

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Development of Top Incomes in Germany since 2001

By Charlotte Bartels and Carsten Schröder

What share of total income in Germany is owned by the country's top income earners and how has this share developed over the past decade? Answers to these questions can be found both in representative survey data such as the longitudinal Socio-Economic Panel (SOEP) study and in administrative data on income taxation. After the statistics have been harmonized accordingly, it becomes clear there remain systematic differences for the top one percent's incomes – both in terms of the level of measured income concentration and in terms of changes over time. However, the two sets of data are very similar for the top ten percent excluding the top one percent as far as both level and trend of income shares are concerned.

In order to explain the recent history of inequality in Germany, we first need to answer several questions that deal with aspects crucial for the measurement of inequality: a) Should income be measured on the individual or household level? b) Should inequality be measured within the German population as a whole or only within a subgroup (taxpayers, for instance)? c) On which income concept (for example, gross or net) should the analysis be based? Then the empirical implementation can begin. In Germany, the empirical analysis can be based on both scientific survey data and administrative data from the tax authorities. A recent discussion suggests that the choice of data base will affect the development of the income share of the top income group.¹

The following analysis describes income concentration in Germany using survey data from the SOEP study and income tax data. In the empirical implementation, we have chosen, for both sets of data, a uniform approach to the key questions raised above (congruence principle). This makes it possible to isolate the effect of the choice of data basis on the measured concentration of income.

Specifically, concentration indicators, for both sets of data, are based on taxable gross incomes of tax units, that is, both joint and individual assessments.

Our analysis focuses on top income recipients, i. e., a societal group with a potentially significant political and social influence. The fundamental question is, of course, to what extent the income share of the top one percent or the top ten percent is a measure of inequality in so-

¹ M. Drechsel-Grau, A. Peichl, and K. D. Schmid, "Einkommensverteilung und gesamtwirtschaftliche Entwicklung in Deutschland Spitzeneinkommen – ein Missing-Link," *Wirtschaftsdienst* 10 (1-5) (2015) use the German Federal Statistical Office's Taxpayer-Panel and the SOEP for an up-to-date inequality analysis. They found systematic differences in the time patterns. However, their study did not implement aforementioned aspects in a uniform manner.

Box 1

Definition of tax units and income concept

The concentration of income is measured at the level of tax units. That is, in the SOEP data, one household with a married couple is treated as one unit and one household with an unmarried couple as two units. The income concept used in the income tax statistics is total income (Section 2 of the German Income Tax Act (*Einkommensteuergesetz, EStG*)), which is composed of the sum of the seven income categories (agriculture and forestry, business, self-employment, employment, capital income, renting and leasing, other), plus tax-relevant capital gains less income type-specific income-related expenses, savings allowances, and

losses. Old-age lump-sum allowance and exemptions for single parents are deducted. Since large tax-deductible amounts, such as special expenses for social security contributions, are not deducted, the total amount of income for most tax households is considerably higher than the actual taxable income to which the tax rate is applied. The total amount of income tax is modeled in the SOEP data by deducting the allowances from the gross income of the tax unit and only adding the taxable share of the pension income. It should be noted, however, that income from self-employment, for instance, is recorded differently in both sets of data and therefore the total amount of income can only be approximately simulated in the SOEP data.

ciety as a whole² and its welfare development,³ or rather an indicator of the concentration of a country's economic power.⁴

Harmonizing data sources for comparable results

In order to generate comparable concentration measures from the income tax and SOEP⁵ data, definitions of the observation unit and income concept must first be harmonized according to the congruence principle. Con-

structing households (and the people living in them) from tax units in the income tax data is impossible due to lack of the necessary information, so we constructed tax units from households in the SOEP.

The tax units in the SOEP data can be determined using information captured about marital status and household members' relationships to each other. Then, the gross household income observed in the SOEP study is divided between the tax units in the household, tax-exempt income is taken into account, and tax allowances deducted to obtain total income as defined by tax law (see Box 1).

We have used the total amount of gross income in a tax unit as the harmonized income concept in both datasets (see Box 1). We have also adjusted the income tax data in order to obtain a harmonized income concept over time, despite the introduction of the half-income assessment method and the flat rate withholding tax (see Box 2).

After harmonization, the concentration of income for the tax units can now be examined over time using the two sets of data. A comparison of dataset-specific findings allows us to assess the effect of the selected data on the measured concentration of income. Specifically, we examined the period from 2001 to 2011.

Snapshot for 2007

Figure 1 shows the different percentiles of top earners in 2007 (top ten percent of the income distribution) and the corresponding income limits based on SOEP and income tax data. Up to the 96-percentile, income levels are higher according to the SOEP than according

² Inequality measurements such as the Gini coefficient and top incomes often evolve similarly over time, but are not completely congruent. See A. Leigh, "How closely do top income shares track other measures of inequality?," *Economic Journal* 117, nos. F619-F633 (2007) and J. Roine and D. Waldenström, "Long run trends in the distribution of income and wealth," in *Handbook in Income Distribution*, vol. 2, eds. A. B. Atkinson and F. Bourguignon (Amsterdam: North Holland, 2014).

³ See also criticism in the latest annual report by the Council of Economic Experts on overall economic development, *Zukunftsfähigkeit in den Mittelpunkt. Jahresgutachten 2015/16* (Stuttgart: Metzler-Poeschel, 2015), 482.

⁴ To calculate an inequality measure such as the Gini coefficient solely using income tax data makes little sense as the lower incomes of pensioners and low-earners are not fully included, if at all. To allow statements about a society's inequality of wealth distribution to be made, tax data should be completed with data about the lower end of the distribution. Examples here include S. Bach, G. Corneo, and V. Steiner, "From Bottom to Top: The Entire Income Distribution in Germany, 1992 – 2003," *Review of Income and Wealth* 55 (2) (2009): 331–359 as well as "Effective Taxation of Top Incomes in Germany," *German Economic Review* 14 (2) (2013): 115–137 and F. Alvaredo, "A note on the relationship between top income shares and the Gini coefficient," *Economics Letters* 110 (2011): 274–77.

⁵ The SOEP is a representative longitudinal study of households conducted every year since 1984 in West Germany and since 1990 in eastern and western Germany by DIW Berlin in cooperation with the survey institute TNS Infratest Sozialforschung, see G. G. Wagner, J. Göbel, P. Krause, R. Pischner, and I. Sieber, "Das Sozio-oekonomische Panel (SOEP) "Das Sozio-oekonomische Panel (SOEP): Multidisziplinäres Haushaltspanel und Kohortenstudie für Deutschland - Eine Einführung (für neue Datennutzer) mit einem Ausblick (für erfahrene Anwender)," *ASA Wirtschafts- und Sozialstatistisches Archiv* 2 (4) (2008): 301–328.

Box 2

Need for correction of administrative data in case of a reform

Both representative survey data and administrative data have potential advantages and weaknesses. Survey data record comprehensive characteristics in the household context which allow a detailed description of inequalities and their causes. In fact, they do not always succeed in attracting a sufficient number of households with very high incomes to participate. This leads to inaccuracies, particularly at the top of the income distribution.

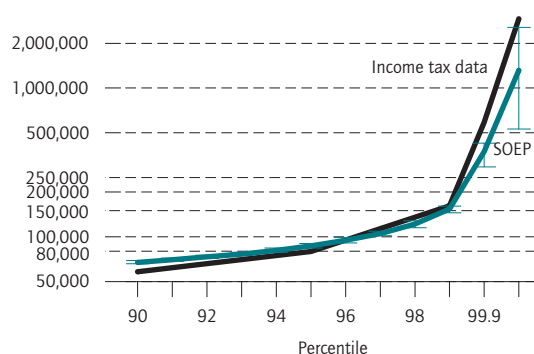
When working with administrative data, an extensive knowledge of reforms during the period under observation is necessary to make the data comparable. Of particular note here are the introduction of the half-income system in 2001/2002 and the flat rate withholding tax for capital incomes in 2009. To obtain an intertemporally comparable time series on income concentration, incomes from the income tax data were adjusted for the effects of these reforms. As a result, following the intro-

duction of the half-income system, only some of the dividends are visible in the income tax data. Since the size of the share (around 38 percent) comes from tax legislation, the underlying basis (100 percent) can be extrapolated. If the full dividend amount is used to calculate the income shares (see Figure 1), the decline due to cyclical trends is considerably lower. Since the introduction of the withholding tax in 2009, the tax liability on dividends and interest is deducted directly at source. This capital income no longer needs to be declared in the income tax return. Tax households whose tax rate is lower than the rate of withholding tax of 25 percent, however, have an incentive to declare this capital income. Since the incomes of high-income households in Germany consist mainly of business income and only around ten to 20 percent from dividends and interest and are subject to a high rate of income tax due to the high commercial income, these households in particular mostly have no incentive to declare their capital income in their income tax returns. External information on the development of capital income is used to correct for this (see Bartels and Jenderny (2015) for details on capital income calculations after 2009).

Figure 1

Income thresholds in 2007

In euro



Source: Bartels, C., Jenderny, K. (2015), and own calculations.

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to tax statistics.⁶ From the 97-percentile percentile upward, the reverse is true. Up to the 99-percentile lim-

it, i.e., up to the top one percent, income tax and SOEP data are close. In the percentile above this, however, the SOEP data is less reliable: in order to determine the top one-tenth of a percent, and the top one-hundredth of a percent, the 95-percent confidence interval in the SOEP data is very large, and the income limits are well below those of the income tax data.

Development of income concentration for the group containing the top one-percent tax units

The data sources gave quite different results for the income share of the top one percent of tax units (see Box 3 for the calculation method). According to the income tax data, the top one percent of earners held between 11 and almost 15 percent of total income from 2001 to 2011, while the corresponding figure from SOEP data was only between around seven and nine percent.

Although the concentration coefficients in both data sources differ, in the first half of the 2000s, they consistently show a parallel increase in the income share accruing to the top one percent. After this period, the trends deviate. According to the income tax data, the increasing income concentration at the top continues up to 2008 and remains at a lower level following the financial crisis in 2009. In contrast, the concentration of

⁶ This finding can be attributed to a possible middle-class bias in the SOEP data. Civil servants, for instance, are overrepresented in the SOEP sample.

Box 3

Calculating income shares

Microdata from a census of all German income taxpayers have been available since 1992. The income share can be determined from a simple count: if the tax cases are sorted in ascending order according to the total amount of income and income values of the richest 482,969 taxpayers aggregated, their aggregate income in 2007 was around 201 billion euros (in 2010 prices).

A comparison with population-representative data is not straightforward for two reasons. First, not all the individuals in Germany are liable to pay income tax. It is assumed that around ten million tax units (assessed separately and jointly) do not submit a tax return. This population group and their incomes are therefore not included in the income tax data. Further, some incomes are not or only partly included in the tax data. For instance, capital incomes below the saver's allowance are not included. The construction of tax data alone does not depict the income situation of the total population. In order to make a statement like "The richest one percent of the population in Germany owns X percent of the total income of households," more information is needed: a) on the share of the population not included in the tax data (around 81 million people live in Germany; in 2007, income tax data counted 38 million taxpayers) and b) on the amount of income from households not included in the tax data.

The potentially taxable population is approximated using the total number of married couples and singles over 20 years.¹ In 2007, there were approximately 48.3 million potential taxpayers—this is our basic population.² This means the richest one per cent of all potential taxpayers includes precisely 482,969 tax units, while this number of cases corresponds to 1.3 per cent of actual taxpayers.

In this analysis, income shares from 2001 to 2008 are calculated on the basis of microdata from income tax, so no additional assumption about the income distribution is required.³ The income share of the richest one percent in 2007 is calculated as:

$$\frac{\text{Aggregated income of top 1 \%}}{\text{Total income}} = \frac{201 \text{ billion}}{1,432 \text{ billion}} \approx 14 \%$$

1 This age limit is used by many scientists who have calculated time series for the World Top Incomes Database (WTID). See also contributions on Germany, the US, and Canada in A. Atkinson and T. Piketty, *Top Incomes Over the Twentieth Century* (Oxford University Press, 2007).

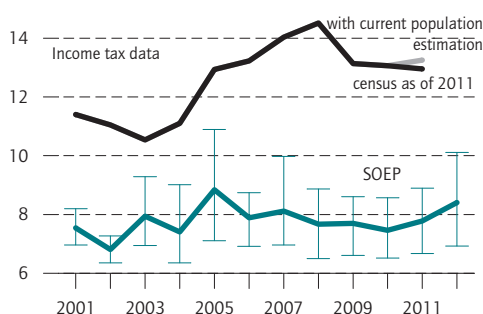
2 These values can be taken from the *Statistical Yearbook*.

3 In order to construct long-term time series since the introduction of income tax in the nineteenth century, tables are required with the number of taxpayers in certain income groups and their aggregate income. These tables have been published in Germany since the mid-nineteenth century by the Statistical Offices of the Federal States.

Figure 2

Income share of top 1%

In percent



Quelle: Bartels, C., Jenderny, K. (2015), and own calculations.

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income in the SOEP data remains virtually unchanged since 2005 and the changes that were recorded are not statistically significant.

When the concentration ratios for 2005 and 2011 are compared, the tax data also show no clear increase since 2005. There are indications that the corporate sector increasingly retained profits and did not distribute them. If these retained earnings had been distributed to top earners, the measured concentration of income would probably be higher.

The lower level of income concentration in the SOEP data is largely due to the top earners in the SOEP data at the upper end of the distribution having considerably lower incomes on average: in 2007, the average income of the top one percent was approximately 258,000 euros (in 2010 prices) according to the SOEP data, but it was around 376,000 euros (in 2010 prices) according to the income tax data.

Assuming the high incomes follow the Pareto distribution, the Pareto coefficient can determine income limits and ultimately the income share of the top ten percent. This method, proposed by Pareto (1896)⁴ and also by Kuznets (1955),⁵ was revived and further developed by Piketty (2003).^{6,7} For the years 2009 to 2011, a Pareto interpolation was conducted based on the tabulated income tax statistics and an adjustment for missing capital income since the introduction of withholding tax (see Bartels and Jenderny (2015)). The income share of the richest one percent in 2007 is calculated as:

$$\frac{a}{(a-1)} \times \text{Income limit of top 1 \%} \times \frac{\text{No. of top 1 \%}}{\text{Total income}}$$

$$= 2.56 \times 161,655 \times \frac{482,969}{1,432 \text{ billion}} = 14 \%$$

⁴ V. Pareto, *Cours D'Économie* (Duncker&Humblot, 1896).

⁵ S. Kuznets, "Economic Growth and Income Inequality," *American Economic Review* 45(1) (1955): 1-28.

⁶ T. Piketty, "Income inequality in France, 1901-1998," *Journal of Political Economy* 111(5) (2003): 1004-1042.

⁷ The time series of more than twenty countries were collected in the World Top Incomes Database (<http://topincomes.parisschoolofeconomics.eu/>) initiated by Piketty and Atkinson, among others.

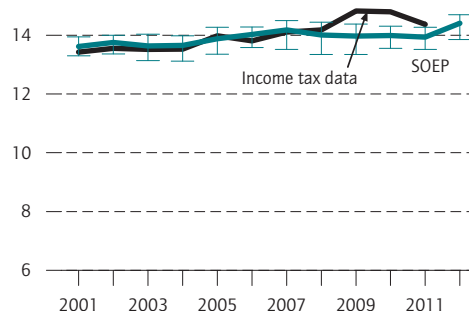
Development of income concentration in other top-income areas

Figure 3 shows the income share accruing to the top five percent of tax units excluding the top one percent (5-1) and Figure 4 shows the shares below the top ten percent excluding the top five percent (10-5). In contrast to findings for the top one percent, hardly any differences between the two sets of data can be identified in these two high-income areas. If we take, for example, the top five and top one percent, irrespective of the dataset used, this gives an income share of around 13 to 14 percent, depending on the year. The trends are similar and indicate a slight increase in income concentration up to 2007. In the top five to top ten percent, irrespective of the dataset used, the income share is around 11 to 12 percent, depending on the year. This indicates, at most, a weak increase in income concentration.

Figure 3

Income share of top 5-1%

In percent



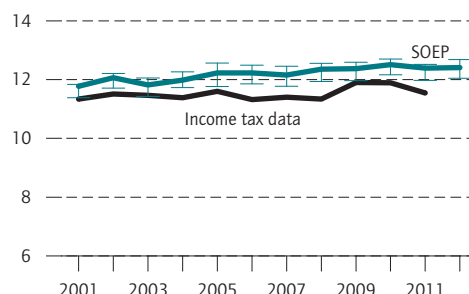
Source: Bartels, C., Jenderny, K. (2015), and own calculations.

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Figure 4

Income share of top 10-5%

In percent



Source: Bartels, C., Jenderny, K. (2015), and own calculations.

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Conclusion

Both the income tax and SOEP survey data provide valuable information about the distribution of income in Germany. However, the two sets of data have differing underlying populations (taxpayers and total population), observation units (tax cases and households), and definitions of income (total income and gross household income). According to the congruence principle, these concepts must be harmonized before the income concentration measures from the two datasets can be compared meaningfully.

In fact, the harmonized SOEP and income tax data tell a similar story about the concentration of income in Germany since 2001: for the top ten to five percent and top five to one percent, there is a small increase in income concentration between the two datasets at a marginally diverging level. For the top one percent, both datasets show a parallel increase in income concentration for the first half of the 2000s, which is not statistically significant, however, in the SOEP data. According to the income tax data, the concentration continues to increase up to 2008 but remains at a lower level after the start of the financial crisis in 2009. Conversely, the concentration of income in the SOEP data has remained almost stable since 2005. The concentration levels for the top one percent are considerably higher according to the income tax data because average incomes in this range differ by more than 100,000 euros between the two datasets.

Overall, the income tax data has the obvious advantage that they contain many more cases of very high income in Germany.⁷ However, it should also be noted that there are three key drawbacks of this data source for inequality research. First, capital income has not been systematically recorded in income tax data since the introduction of the flat rate withholding tax introduced in 2009 which particularly affects the top income range where

capital income is concentrated. If, as is currently being discussed by policy-makers, the flat rate withholding tax is in fact abolished and capital income is once again taxed as personal income tax, then income tax data would become a more reliable source for capital income again. Second, the income tax data do not provide a very full description of the income situation at the lower end of the distribution because individuals with low incomes do not usually need to declare their income and are therefore not included in the data. Third, no equivalent income can be determined using income tax data due to a lack of information concerning the household context. Equivalent income is needs-weighted incomes, incomes that take into account differences in needs between households with different compositions, such as number and age of household members, and are standard distribution analyses.

To obtain a full picture of the development of inequality in Germany since 2001 and not just of income concentration at the very top, incomes in the lower and middle income classes in the SOEP data must be combined with incomes among the top ten percent from the income tax data.⁸ Future studies should look at further developing relevant approaches to this.

7 No single case of gross household income exceeding two million euros was recorded in the SOEP data for 2013.

8 See Bach, Corneo, and Steiner "From Bottom to Top."

Charlotte Bartels is Research Associate in the Research Infrastructure Socio-Economic Panel (SOEP) at DIW Berlin | cbartels@diw.de

Carsten Schröder is Deputy Head of the Department Infrastructure Socio-Economic Panel (SOEP) at DIW Berlin | cschroeder@diw.de

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DIW Berlin – Deutsches Institut
für Wirtschaftsforschung e. V.
Mohrenstraße 58, 10117 Berlin
T +49 30 897 89 -0
F +49 30 897 89 -200

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Press office

Renate Bogdanovic
Tel. +49-30-89789-249
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